Regional Air Service Development Opportunities Study

Final Report to

HI TRANS
THE HIGHLANDS AND ISLANDS TRANSPORT PARTNERSHIP

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EXECUTIVE SUMMARY

Introduction

The objectives of the research were to:

- Consider means of maximising the use of two new Twin Otter aircraft that Scottish Government has committed to purchase.
- Identify other opportunities for new and/or enhanced air routes using spare aircraft capacity available in the west Highlands & Islands.
- Investigate route developments' likely impacts in terms of fleet, crewing and operating costs.
- Assess the ability of any new or enhanced routes to secure best value to the public purse and support sustainable economic growth in the Highlands & Islands. This was to include a high level demand assessment, recognising that further research would be required if any of the identified route options are pursued.
- Assess how individual route enhancements can best be delivered.

Research Methods

The work was undertaken through:

- Desk-based review of previous studies, and other information.
- Consultations with key economic and social organisations, and consider the perspectives of Transport Scotland, HIAL and a number of airlines.
- Review of engineering and operational requirements for the Twin Otter and other relevant aircraft types.
- Review of potential funding mechanisms.
- Identification of potential new/enhanced routes for detailed consideration.
- Internet survey of potential demand for new/enhanced routes.

Initial Research

Our initial review indicated that the two Scottish Government Twin Otters would have very limited spare time available for other uses. This reflects the extent of their commitments to existing Scottish Government PSO routes. However, the research identified potential to use BN2 Islander aircraft and the Saab to create additional capacity.

The following potential routes were identified for detailed consideration: Oban-Barra; Oban-Campbeltown; Oban-Glasgow. In addition consideration was given to: enhancements to the existing Glasgow-Barra service; and how a Glasgow-Skye service might be operated.

Oban-Barra

The high level demand assessment identified a potential demand of 1,575 and 1,800 passengers per annum.

The demand is expected to:

- Be mainly outbound leisure traffic from Barra.
- Include little inbound leisure apart from sightseers.
- Have only a small business component.

The best means of operating this service would be via an Islander aircraft based at Oban.

Oban-Campbeltown

The high level demand assessment identified a potential demand of up to 900 passengers per annum. The demand is expected to:

- Be largely business traffic originating in the Oban area.
- Include some visitors to the area looking to connect between Campbeltown and Oban as part of a wider trip to the Highlands & Islands.

An Oban-Campbeltown route is almost impossible to fulfil with a Twin Otter, under any foreseeable circumstances. It would be difficult and very costly to operate the service in conjunction with existing routes. An Islander operation is feasible. However, it would require an additional aircraft to be introduced into the network.

Oban-Glasgow

The high level demand assessment identified a potential demand of up between 2,700 and 3,150 passengers per annum. The demand is expected to:

- Be oriented towards outbound leisure.
- Dependent on a capturing a proportion of the current traffic flying to/from Glasgow, which has a surface origin or destination in the Oban area.

The best means of operating this service would be via an Islander aircraft based at Oban.

Barra-Glasgow

The survey results imply that the greatest demand for additional capacity is on the days in June, July and August when at least double rotations already operate. They also show a preference for additional flights in the winter rather in the summer months outside June-August.

Those who expressed a preference for more seat capacity during October-March most commonly referred to Fridays and Mondays. The results indicate that additional flights would be made on the service if its frequency was increased.

There are two operational options:

1 a) Offer additional flights on days when there currently only is one service scheduled; and/or
   b) Lengthen the period of the year when double rotations operate.

2 Where demand warrants it, provide three rotations on days when two Twin Otters are available.

Glasgow-Skye

A Glasgow-Skye timetable could be combined with one for Glasgow-Barra. However, this would require the use of two Twin Otters. The outline schedule assumes that night-time operations are possible at Skye; and that the Glasgow PSO services to Campbeltown and Tiree are covered by a Saab or similar aircraft.

A variant of the above would be to operate a Glasgow-Skye service via Oban combined with a Glasgow-Barra service. However, this raises a number of scheduling issues. In particular a: first arrival in Glasgow around 1100; long day trip for passengers travelling from Glasgow to Oban or Skye; 90 minute flight time between Skye and Glasgow. When only one Twin Otter is available (with the other in maintenance), and the aircraft has a technical problem, or the aircraft is delayed because of weather and there is slippage in the timetable, the services are at risk.

A BN2 Islander could provide a Glasgow-Skye service. This assumes, however, that the aircraft would meet passenger comfort expectations.

However, the operators we consulted raised significant concerns about basing, or overnighting, the Twin Otter on Skye (or at Oban). This was on the grounds of: crew resistance; increased crew costs; and engineering support requirements.

General Conclusions

1

There is a role for the BN2 Islander in testing new route options.

2

The Saab 340B or an equivalent aircraft could be used to undertake the Tiree and Campbeltown PSOs should there be other short take off and landing activities (notably Glasgow-Skye) for the Twin Otter fleet to undertake.

3

Innovations will not occur unless funds are identified and provided by interested parties.

4

A means is required to better understand NHS's requirements in research into air route development and in any subsequent changes to the air network.

5

The various PSO sponsoring authorities across Scotland could examine generic and potentially collaborative marketing approaches for their routes.

6

Argyll and Bute Council/Oban Airport could work to encourage the Inner Hebrides PSO operator to move another aircraft to Oban for charter use.

7

Neither the amphibian nor seaplane Twin Otter options are suitable for combining a Glasgow-Skye seaplane service with the current Glasgow-Barra service.

Recommendations

A

Share the study findings with Loganair to allow them to review and consider whether the evidence supports additional Glasgow-Barra flights.

B

Attract an Oban-based BN2 Islander to facilitate more charter activity.

C

Providing fuel at Barra could allow two extra Twin Otter seats on inbound flights from Glasgow. However, feasibility would depend on regulatory, environmental and practical issues.

D1

Explore Oban-Barra using de minimis funding, and the current BN2 Islander, on a 16 week summer trial (for one or two years). Need pre-agreement about how any subsequent operation would be funded. Could be stand alone or combined with an Oban-Glasgow trial (D2).

D2

Explore Oban-Glasgow using de minimis funding, and the current BN2 Islander, on a 16 week summer trial (for one or two years). Need pre-agreement about how any subsequent operation would be funded.

E

Do not consider Oban-Campbeltown further.

F1

Give further consideration to a Glasgow-Skye service using a Twin Otter. This could be pursued if Scottish Government agree that other aircraft would undertake the Glasgow-Tiree and Glasgow-Campbeltown services, to free up Twin Otter capacity. However, there is a need to recognise that there will be service integrity challenges when both Skye and Barra are served with a fleet of only two Twin Otters, and the costs for providing such a service, our investigations suggest, will be greater than previously estimated.

F2

Give further consideration to a Glasgow-Skye or Skye-Glasgow service with a BN2 Islander. If the aircraft was based at Skye then a hangar would be required.

F3

Consider other alternative approaches to the amphibian and seaplane Twin Otter options for Skye that were reviewed in this study.

BN2 Islander and ferry options in the Inner Hebrides

1 INTRODUCTION

This is the final report of the Regional Air Service Development Opportunities Study. The research was undertaken on behalf of HITRANS between April and July 2013.

1.1 STUDY OBJECTIVES

The Scottish Government has committed funding in their budget to the procurement of two new Twin Otter aircraft. These are to serve the Scottish Government funded Public Service Obligation (PSO) air services from Glasgow to each of Barra, Campbeltown and Tiree.

The objectives of the research were to:

1

Consider means of maximising the use of these two new Twin Otter aircraft. This would be either through establishing new routes in the west Highlands & Islands or enhancing the schedules of existing routes, including the Glasgow-Barra PSO service.

2

Identify other opportunities for new and/or enhanced air routes using any spare aircraft capacity currently available in the west Highlands & Islands.

3

Investigate the likely impact these route developments' in terms of fleet, crewing and operating costs.

4

Assess the ability of any new or enhanced routes to secure best value to the public purse and support sustainable economic growth in the Highlands & Islands. This was to include a high-level demand assessment, recognising that further research would be required if any of the options identified were to be pursued further and would encompass more detailed demand assessment, plus cost-benefit analysis and economic impact assessment.

5

Assess how individual route enhancements could best be delivered. This was to include consideration of the use of the PSO instrument, the extension of the Air Discount Scheme (ADS) and de minimis financial support.

The study was to build upon, but not duplicate, the recently completed *Skye Air Services Feasibility Study*, and the opportunities outlined in that report. In particular our review of Twin Otter operations and costs is to be used to inform a more detailed business case that could be developed for any future Skye – central belt air service.

1.2 RESEARCH METHODS

1

Review of previous studies, and desk-based research into existing air services and surface transport provision.

2

Face-to-face and telephone interviews with key economic and social organisations in the relevant areas, HIAL and a number of airlines. The number and range of consultees reflected the significant amount of consultation on Highlands & Islands air service developments undertaken in recent years.

3

Review of engineering and operational requirements for the Twin Otter, and similar analysis for other aircraft types operating in the relevant areas.

4

Desk-based review of PSO legislation and practices, ADS and de minimis funding procedures.

5

Identification of potential new and enhanced routes for detailed consideration in the study. At an interim meeting with HITRANS these were agreed along with agreement on findings to date at that stage and the methodology applied to subsequent research.

6

An internet survey-for personal and business respondents-of potential demand on the routes that the study covered in detail. This was undertaken, initially, between May 15 and June 10. To encourage further responses the survey was then reopened between June 11 and June 17. It was publicised through various websites, print media and social media sites.

1.3 STRUCTURE OF THE REPORT

Chapter 2 Explains the basis of the study. This in terms of the potential to use available aircraft capacity to develop new or enhanced services.

Chapter 3 Describes the initial research that identified specific routes for detailed consideration as part of the study.

Chapters 4-6 Analyses the potential to establish three specific new air routes.

Chapter 7 Analyses potential enhancements to the existing Barra-Glasgow air service

Chapter 8 Covers some issues around the introduction of a new air route between Glasgow and Skye.

Chapter 9 Contains some general conclusions.

Chapter 10 Provides recommendations arising from the research.

There are also a number of Appendices:

A: Online Survey Results
B: Bibliography
C: List of Consultees
D: Twin Otter Maintenance Considerations
E: Twin Otter Lease and Maintenance Costs for Glasgow-Skye Service
F: Oban-based Islander Timetable Elaborations

2 BASIS OF THE STUDY

2.1 INTRODUCTION

This Chapter covers a range of information which has formed the basis for the work reported in subsequent Chapters. It looks in turn at:

- Current scheduled air services in the west Highlands & Islands.
- Scottish Government's proposed purchase of new Twin Otter aircraft.
- Twin Otter operational characteristics and capabilities.
- Current deployment of aircraft to undertake the Scottish Government Glasgow PSO services.
- Available spare capacity of new Twin Otter aircraft.
- Other aircraft operating scheduled services in the west Highlands & Islands- Saab 340 and BN2 Islander.
- Financial support mechanisms for air services.

2.2 WEST HIGHLANDS & ISLANDS SCHEDULED AIR SERVICES

2.2.1 PSO Services

Overview

Figure 2.1, over, shows the PSO services operating in the west Highlands & Islands.

The Scottish Government and CnES PSOs run from April 2013 until March 2017. Both are currently operated by Loganair.

Argyll and Bute Council's Inner Hebrides PSO runs from May 2011 until April 2014. It is currently operated by Hebridean Air.

2.2.2 Glasgow PSO Air Services

Timetable

Table 2.1 shows the requirements of the Glasgow PSOs' specification.

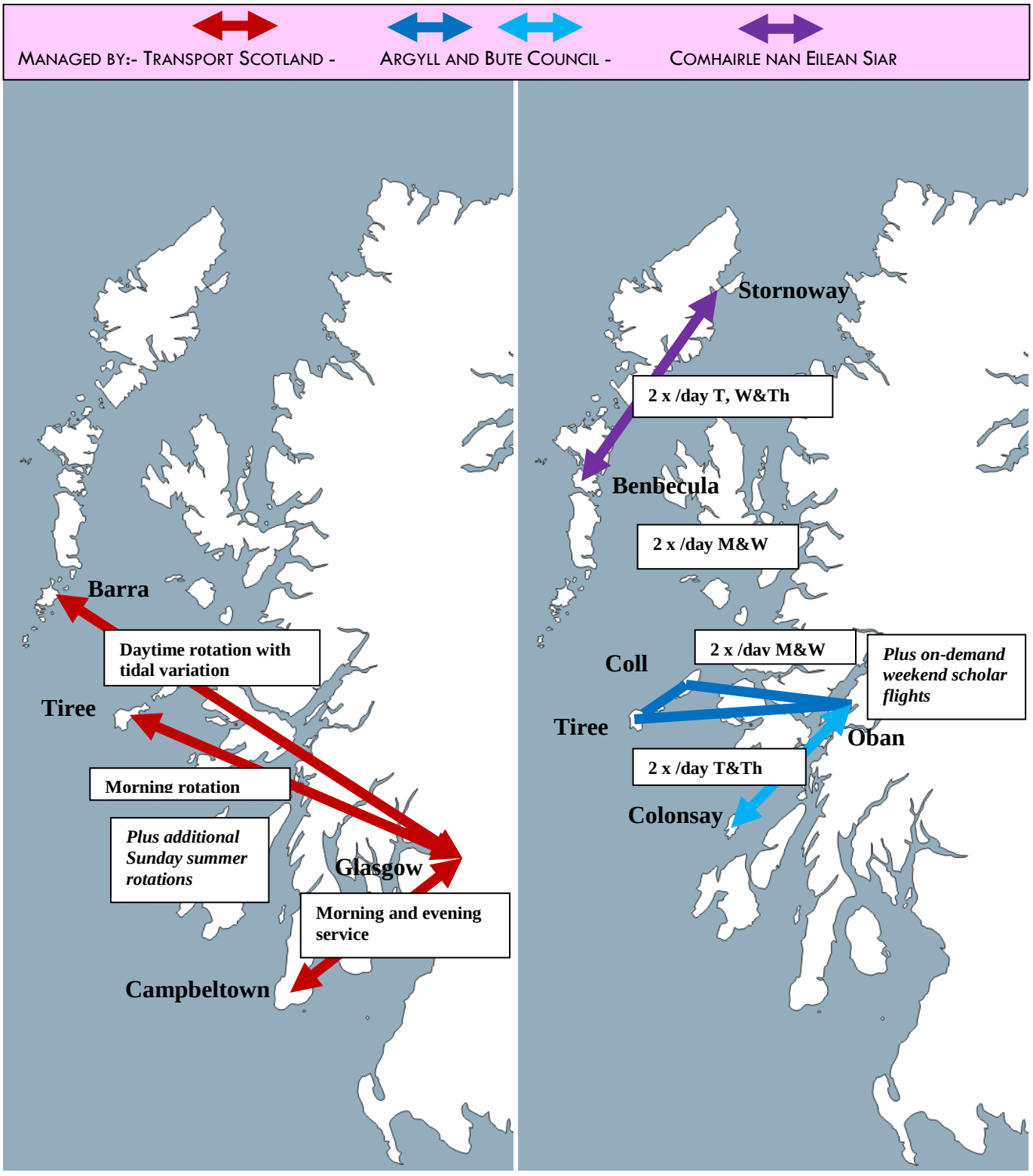
TABLE 2.1: GLASGOW PSOs SPECIFICATION

Route	All Year Round		Summer Only*	
	Days	Frequency Per Day	Days	Frequency Per Day
Barra	Mon-Sat	1	Sun	1
Campbeltown	Mon-Fri	2	Sun	1
Tiree	Mon-Sat	1	Sun	1

* Mid June to end of September

Loganair previously provided Sunday services to Barra and Tiree at their own commercial risk. However, these services are now part of the new PSO contract commencing April 2013. The Campbeltown summer Sunday service also commenced in 2013 as a two year trial.

Figure 2.1: West Highlands & Islands PSO Services



On around 80 days of the years Loganair operate double rotations to Barra-between April and September. The majority of these are outside the PSO contract-i.e. at the airline's own commercial risk. This reflects seasonality of demand in a context of the limited capacity of the Twin Otter aircraft which is required to operate the service to/from the tidal beach airstrip on the island.

Capacity can be as low as 13 seats on flights into Barra and 15 seats on flights out of Barra. The specified minimum capacity into Barra. This is because of the need to 'tanker' fuel as Barra airport does not have a fuelling capability.

Table 2.2 shows the summer 2013 timetable on the three PSO routes.

TABLE 2.2: GLASGOW PSOs TIMETABLE: SUMMER 2013

Day	Barra	Campbeltown	Tiree
Monday	1 flight per day April-May 20; September 9-onwards 2 flights per day May 27-September 2	Monday-Friday 2 flights per day Ex Glasgow 0850 1625 Ex Campbeltown 1000 1730	Monday - Friday 1 flight per day Ex Glasgow 1110 Ex Tiree 1230
Tuesday	1 flight per day	As above	As above
Wednesday	1 flight per day	As above	As above
Thursday	1 flight per day April-May 23; September 12-onwards 2 flights per day May 30-September 5	As above	As above
Friday	1 flight per day April-May 17; September 13 onwards 2 flights per day May 24-September 6	As above	As above
Saturday	2 flights per day from April-end September	No Flights	1 flight per day *Mid April-end September* Ex Glasgow 1230 Ex Tiree 1345 *Other times largely* Ex Glasgow 0900 Ex Tiree 1020
Sunday	*mid-June to end September* 1 flight per day (*mid-June to end September*)	*mid-June to end September* 1 flight per day Ex Glasgow 1715 Ex Campbeltown 1825	*mid-June to end September* 1 flight per day Ex Glasgow 1100/1425 (mostly) Ex Tiree 1225/1550 (mostly

This indicates the additional flights that operate to Barra outside the PSO. These are on Mondays, Thursdays, Fridays and Saturdays. The greatest demand for travel is on Saturdays with double rotations operating from April to the end of September. The double rotations on the other three days are undertaken between late May and early September.

In contrast, Loganair can cope with the peaks of demand on the Tiree service by introducing a Saab 340 onto the Tiree service, so as to increase capacity from 18 to 34 seats. Once again this helps deliver variable capacity to respond to known peaks, but is outside the formal stipulation of the PSO. Loganair provides this enhancement, at their own cost and risk. The tidal nature of the Barra airstrip means that using a larger aircraft to accommodate peak demand is not an option.

Passenger Volumes

Table 2.3 shows annual passenger carryings on the three Glasgow PSO routes.

TABLE 2.3: GLASGOW PSO ROUTES: ANNUAL CARRYINGS

Year	Barra	Campbeltown	Tiree
2009	8,703	9,334	7,305
2010	8,555	8,682	7,171
2011	8,406	9,192	7,767
2012	9,023	8,554	7,864

In 2012 the Barra service had the highest volumes-just over 9,000 passengers. This is the highest level on the route in the four years covered by the data. In the earlier years Campbeltown saw the highest passenger numbers (including over 9,300 in 2009) with the volumes fluctuating year by year. Tiree has the lowest traffic levels. However, they are not that much different from the other two routes and have increased in each of the last two years.

Table 2.4 shows the seasonal variation in traffic, based on 2012 carryings.

TABLE 2.4: GLASGOW PSO ROUTES: MONTHLY CARRYINGS: 2012			
Month	**Barra**	**Campbeltown**	**Tiree**
January	474	522	555
February	386	602	470
March	549	735	616
April	750	750	570
May	901	959	665
June	972	787	823
July	1,182	624	1,036
August	1,294	741	882
September	757	885	589
October	650	832	607
November	578	618	557
December	530	499	494
Annual Total	**9,023**	**8,554**	**7,864**

Source: CAA

Barra's traffic is the peakiest. The monthly carryings in July and August are above those seen in any month on the other two routes. The four busiest months (May-August) account for almost half (48%) of annual carryings. The figures for Campbeltown and Tiree are 40% and 42%, respectively. There is clearly seasonal peaking on the Tiree service but it is not as pronounced as on the Barra route.

Traffic Composition

Table 2.5, over, describes the composition of traffic on the three routes. The exact results should be treated with caution as they are based on small numbers of passenger interviews undertaken as part of the 2009 CAA Passenger Survey.

The routes can be described as follows. **Barra**:

- Largely leisure traffic.
- Very largely inbound demand.
- Inbound leisure accounts more than half of the carryings.
- Very little outbound business traffic.

TABLE 2.5: GLASGOW PSO ROUTES: TRAFFIC COMPOSITION: 2009			
Traffic Type	**Barra**	**Campbeltown**	**Tiree**
Business	29%	18%	34%
Leisure	71%	82%	66%
Inbound	77%	46%	65%
Outbound	23%	54%	35%
Inbound-Business	23%	15%	29%
Inbound-Leisure	53%	31%	35%
Outbound-Business	5%	3%	5%
Outbound-Leisure	18%	51%	31%

Source: CAA

Campbeltown:

- Heavily leisure-oriented.
- Quite even split between inbound and outbound traffic.
- Inbound leisure accounts for more than half of the carryings.
- Very little is outbound business traffic.

Tiree:

- Business is over one third of carryings.
- Around two thirds of demand is inbound.
- Inbound broadly split evenly between leisure and business passengers.
- Very little is outbound business traffic.

2.2.3 Oban Services

PSO Services

The schedule of these services was shown at **Figure 2.1,** earlier. Flight times from Oban-with two return flights on two days per week-are as follows:

- Coll: 30-65 minutes.
- Colonsay: 30 minutes.
- Tiree: 35-55 minutes.

By comparison the ferry services between Oban and each island are:

- Coll: 4-7 return sailings per week (winter-summer). Crossing times between 2h 40m and 4h 35m.
- Colonsay: 4-5 return sailings per week (winter-summer). Crossing times between 2h 20m and 2h 40m.
- Tiree: 4-7 return sailings per week (winter-summer). Crossing times between 3h 20m and 4h 5m.

Non-PSO Service: Oban-Islay Via Colonsay

One innovation by the air operator has been the introduction of a link between Oban and Islay via Colonsay. The flight operates Tuesdays and Thursdays (timetable in appendix), and is effectively an extension of the Oban-Colonsay service on to/from Islay. The service has been delivered without additional subsidy, outside the specification of the PSO.

Passenger Figures and Composition

A key consideration in the establishments of the Oban flights was to allow island secondary school children to come home more easily and more often from Oban High School. This aspect of the service is designated "scholar flights" and these are performed separately, during term times, and by demand.

In 2012 the volumes-excluding scholars-carried has risen to 3,224 passengers compared to 2,510 during 2011; a 28% annual increase. In addition, some 304 scholar trips were made.

Table 2.6 provides a profile of demand on the services, excluding scholars.

TABLE 2.6: OBAN SERVICES-PSO AND ISLAY: EXCLUDING SCHOLAR TRAFFIC		
Traffic Type	**Passenger Numbers**	**Share**
Leisure	1,251	39%
Business	1,167	36%
Health related	806	25%
Total	**3,224**	**100%**

The business share is similar-all though above-that on some of the Glasgow PSO services (as shown at **Table 2.5**). Some 14% of all flights are made by Argyll and Bute Council staff. This, plus health-related traffic, accounts for around 40% of all demand. This shows the importance of these two sources to overall passenger carryings.

Table 2.7 breaks down passenger volumes by route.

TABLE 2.7: OBAN SERVICES CARRYINGS BY ROUTE: EXCLUDING SCHOLAR TRAFFIC	
Route	**Passengers**
Oban-Tiree	1,046
Oban-Colonsay	832
Oban-Coll	716
Oban-Islay	452
Colonsay-Islay	94
Coll-Tiree	84
Total	**3,224**

Carryings to/from Tiree are highest-at over 1,000 per annum. Those for Colonsay total over 900, followed by Coll with approaching 800 passengers per annum. The services to Islay see around 550 passengers.

Thus, there is no apparent relationship between the islands' population level and the volume of air passenger traffic on the Oban services. The population of Islay is-at over 3,000-more than the other islands combined. Similarly, the population of Tiree is more than twice the combined total of the residents of Coll and Colonsay.

This may be because there are fewer essential services in Coll and Colonsay, reflecting their low population levels. As a consequence there is a greater need for mainland-based service providers to visit the two islands, and for residents to travel off the islands to access services. It will also be noted that the Oban air service is the only one available, unlike Tiree and Barra which have an alternative air service to Glasgow.

2.3 SCOTTISH GOVERNMENT PURCHASE OF TWIN OTTERS

As noted at **Chapter 1**, this study was prompted by the Transport Minister's announcement in March 2011 that the Scottish Government has committed to the procurement of two new Twin Otter 400s to serve the Glasgow PSO air services.

We understand that a firm aircraft order has not yet been placed. A range of options for acquisition exist (i.e. not just buying direct from the manufacturer), and therefore the aircraft could potentially be available sooner than would otherwise be the case. The expectation is that orders will be firmed up in the near future. Nonetheless uncertainty remains over the delivery of these aircraft.

As noted earlier, the current PSO is set to run for the maximum four years, from April 2013. The contract, as is usual, does however have a six month termination clause, which would allow the tender to be re-specified once a firm delivery date for the new aircraft was established.

We assume that once the Scottish Government receives the aircraft then the PSO contract would be converted to an operational and maintenance basis, with the aircraft leased to the successful bidder. This model is used by Shetland Islands Council for the operation of its internal PSO services by BN2 Islanders, and the Scottish Government's fisheries reconnaissance aircraft.

2.4 TWIN OTTER AIRCRAFT

2.4.1 Introduction

The DHC-6 Twin Otter is a Canadian 19-passenger aircraft. It was developed by de Havilland of Canada. The first six Twin Otter aircraft produced were designated Series 1, indicating that they were prototype aircraft and first flew in 1965. In 1969, the successful series 300 was introduced. Over 600 were made before production ended in 1988.

In 2006 Viking Air announced its intention to offer a series 400 Twin Otter. In the following year they announced that, with 27 orders and options in hand, they would be restarting production. Their first new aircraft was delivered in July 2010.

The aircraft does have undercarriage adjustments that permit water operations. In some parts of the world, the Twin Otter 400 is offered with floats in either amphibian or seaplane configuration with the amphibian option being heavier and more expensive. The amphibian option allows the aircraft to land on both land and water. Owing to the time required to undertake the conversion it would not be practical to keep changing the aircraft between landplane and seaplane mode.

These issues are covered in more detail at **Appendix D**. The general issue of potential seaplane operations is revisited briefly later in the report.

2.4.2 Suitability for Serving Barra

The unique Barra beach airport requires aircraft with very special Short Take Off and Landing (STOL) and resilience characteristics. This is to deal with the approved runway length and the highly corrosive effects of the sand and salt water environment. The Twin Otter's fixed tricycle undercarriage simplifies corrosion control. A retractable undercarriage would bring the salt and sand into the undercarriage housing.

2.4.3 Unpressurised and Noisy Cabin

Because the Twin Otter is unpressurised the aircraft cannot fly above a height that would cause discomfort or debilitation of passengers or aircrew. In practice this usually limits the aircraft to a ceiling of approximately 10,000 feet. This limitation means that the aircraft is not able to fly 'above the weather' to the same extent as a pressurised aircraft.

The high wing arrangement with under-slung engines delivers excellent Short Take Off and Landing (STOL) Performance, but the arrangement also results in a relatively noisy cabin experience for passengers.

The consensus amongst those consulted was that journeys over one hour in length would become uncomfortable. Many air operators offer earplugs or ear defenders as an option to passengers to ameliorate this feature of the aircraft.

2.4.4 Turbulence

Slower aircraft tend to be more prone to turbulence. This is because they have relatively large wings which are subject to greater gust loads.

Wind speed at cruise level, over areas of the Highlands & Islands, may affect passenger comfort on the Twin Otter. This is shown at **Table 2.8**.

TABLE 2.8: TWIN OTTER PASSENGER COMFORT AT VARIOUS WIND SPEEDS

Wind Speed (knots)	Passenger Experience
30-40	Uncomfortable
40-60	Very uncomfortable
More than 60	May be extremely uncomfortable

Note that these are wind speeds at cruise altitude which will normally be 10-30 knots faster than those at the surface. Therefore, surface winds of 30 knots may result in extreme discomfort for passengers at height. Flights remaining substantially over the sea are likely to avoid the worst turbulence found over the mountains.

In turbulent wind conditions (quite likely in winds of 40+ knots) the aircraft may have to reduce speed by 25 knots for safety reasons, further increasing flight times. Furthermore, strong wind conditions are likely to coincide with poor weather conditions requiring an instrument approach, potentially adding another 5-10 minutes to flight times.

2.4.5 Descent Speeds

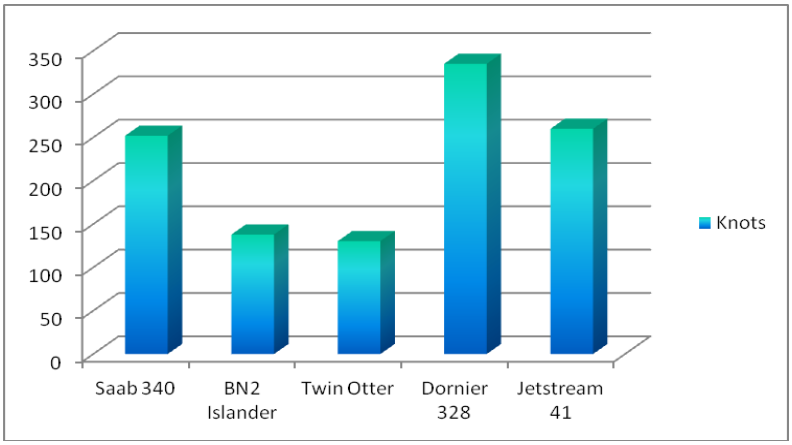
Because the aircraft is unpressurised, passenger comfort necessitates a normal descent rate that is limited to 800 feet per minute (500 is preferred). When descending from 9,000 feet, this implies more than 10 minutes in the descent.

When descending over the sea, this will add little to sector time. But descent over the Highlands (e.g. descending for approach for landing at Skye, from Glasgow) may need to be delayed until almost over the destination due to the presence of high ground, under the aircraft-effectively, and the aircraft may need to circle overhead while losing altitude. This will add a few minutes to the total sector time.

2.4.6 Relatively Slow

As shown at **Figure 2.2**, the Twin Otter (like the BN2 Islander) is a relatively slow aircraft.

Figure 2.2: Cruise Speeds for Various Scottish Based Regional Aircraft



As noted earlier, slower aircraft are more prone to headwind delays. This is elaborated at **Table 2.9**.

TABLE 2.9: TWIN OTTER HEADWIND TIME PENALTIES

Head Wind Penalty Over Still Air Time	Increase in Sector Time (approximate)	Comparable Saab 340 Time Penalty (approximate)
40 knot H/W-Glasgow-Barra	20 minutes	5 minutes
40 knot H/W-Kirkwall- Glasgow	25-30 minutes	10 minutes

This potential for extended sector times in headwind conditions needs to be considered when timetabling longer sectors with a Twin Otter. How this might translate for a Kirkwall-Glasgow service using a Twin Otter is set out at **Table 2.10**, over.

The potential for extended sector times led us to discount the practicality of using the Twin Otter aircraft for longer sectors over the central mountains of Scotland-notably Kirkwall-Glasgow and Aberdeen-Oban (see **Chapter 3**).

TABLE 2.10: KIRKWALL-GLASGOW SECTOR TIMES IN VARYING WEATHER CONDITIONS		
Conditions	**Sector Time**	**Expected Incidence Throughout Year**
Good weather, light wind	1h 20m	50%
Poor weather, light wind	1h 30m	15%
Good weather, 40+ knots H/W	1h 45m	15%
Poor weather, 40+ knots H/W	2h	15%
Poor weather, 40+ knots H/W Severe turbulence	2h 15m	5%

2.4.7 Flying In Icing Conditions

As a Canadian design, the aircraft can be expected to operate relatively well in icing conditions. However, inability to operate above 10,000 feet puts the aircraft into potentially the worst of the icing conditions, whilst flying over the Highlands.

While operating over the sea, the aircraft may have the option of descending into warmer temperatures or below cloud to avoid icing. However, this option is not available during flight over high ground in the Highlands.

Therefore, re-routing, or even diversion, due to severe icing conditions may be more likely (especially for flight across the central or western Highlands), compared with modern pressurised aircraft (which can climb above the icing). Of course, re-routing would add to sector flight times.

2.4.8 Ground De-Icing

The Twin Otter requires Type 3 de-ice fluid. This is not always available at UK airports, and may require a handling agent to arrange additional supply, storage, and spray equipment.

2.4.8 General Route Considerations

Over-sea tracks facilitate visual approaches. This may save time on those sectors where such tracks can be flown, such as between island airports and airports on adjacent coasts. For example, Stornoway to Skye may be flown below a cloud base of 1,500-2,000 feet, permitting a visual approach; whereas Glasgow to Skye in the same weather conditions would require an instrument approach.

For flights to non-instrument approach airports (Skye Options A and B in the Feasibility Study), it may be possible to make an instrument approach at an adjacent airport, and then route below cloud to the destination. For example Glasgow-Skye: fly to Stornoway, carry out ILS approach, then fly back to Skye at 1,500 feet. However, this would add 45 minutes to a flight from Glasgow to Skye. Also, it would be reliant on good visibility below cloud and no substantial areas of very low cloud or fog.

An alternative is to descend to low level over the sea. This is an operation with significant risks to be managed. On the Glasgow-Skye route it may be considered acceptable to fly to the SW of Skye / North of Tiree before descending over the sea; then fly below cloud through the Sound of Sleat to approach Broadford.

2.4.9 Maintenance Considerations

Introduction

These issues are covered in detail at **Appendix D**. They are summarised below.

The analysis covered two issues in particular. First, the maintenance impact of replacing the existing two Twin Otter 300s (operated by Loganair) with two brand new Twin Otter 400 aircraft. Second, whether having two Twin Otter 400s provides an opportunity to expand the services offered to other "high performance" destinations (including Skye).

Maintenance Issues

The maintenance of the Twin Otter essentially boils down to:

- Daily Service Inspections and washing (of the Barra aircraft).
- Weekend Routine Inspection and more extensive washing of the engines in particular.
- Weekend Equalised Maintenance for Maximum Availability (EMMA) checks when due.
- Annual corrosion checks.

The following points should be noted:

1) Increasing the utilisation of the aircraft will not increase the frequency of the daily Service Inspections or weekly Routine Inspections. These are based on calendar intervals.

2) A new Twin Otter 400 will not significantly reduce the amount of maintenance required to carry out the daily Service Inspections and weekend Routine Inspections and washing tasks compared with the older Twin Otter 300s.

3) Increasing the utilisation of the aircraft will increase the frequency of the EMMA checks and therefore the workload during the weekends when these take place.

4) A new Twin Otter 400 should benefit from reduced defect rectification arising from the EMMA checks compared with the older Twin Otter 300s. However, this will not increase the availability of the aircraft since these are generally carried out at weekends.

5) Increasing the utilisation of the aircraft will not affect the frequency of the Corrosion Inspections since they are based on calendar intervals.

6) A new Twin Otter 400 will initially benefit from much lower maintenance relative to the current annual corrosion inspections on the Twin Otter 300. This will reduce the downtime of the aircraft.

Replacing the two existing Twin Otter 300 aircraft operated by Loganair with two new production Twin Otter 400s will not *in itself* open up opportunities to expand the existing network of services. The only immediate benefit will be a reduction in downtime during the aircrafts' annual corrosion inspection.

An attempt to expand the Twin Otter operation to incorporate more "high performance" destinations (e.g. Skye) will affect the reliability of the existing Barra service. There would not be adequate fleet redundancy in the system.

In order to operate two Twin Otters on scheduled services that require their unique performance capability any operator is going to:

- Need access to either a third Twin Otter; or
- Be willing to accept service disruption in the event of an unscheduled failure, and reduced service during scheduled maintenance downtime.

Maintenance Costs

Maintenance Costs

The maintenance costs of a new Twin Otter 400 would be somewhat less than the maintenance costs of an older Twin Otter 300, and this is aired in more detail in Appendix D. However there are also extra maintenance costs connected with Barra beach operations, and if an aircraft is shared between that route and other routes then those extra costs could be applicable to the whole flying programme.

2.4.10 Lease Costs

The Scottish Government will probably choose to lease the aircraft at a set rate to the operator of its future PSOs. We return to this matter later in the report.

2.5 CURRENT DEPLOYMENT OF AIRCRAFT ON GLASGOW PSO SERVICES

Our consultations pointed to the limited amount of additional availability the two Twin Otters will have because of their existing commitments on the Scottish Government PSO services.

The current deployment of the two Twin Otters is rather complex. It is further complicated by the provision of additional flights to Barra outwith the PSO specification, as noted earlier.

Generally, the current Twin Otters are each in scheduled maintenance for about six weeks per year. In addition, there appears to be a further two weeks of unscheduled maintenance. Thus, for nearly four months each year there is only one Twin Otter available. Also, and as noted earlier, during the summer there are additional non-PSO rotations on the Glasgow-Barra services.

The usual pattern during the *winter* timetable is for Twin Otter 1 to fly the Barra and the evening Campbeltown rotations, whilst Twin Otter 2 undertakes the morning Campbeltown and the Tiree rotations. Basically two crew undertake 4 legs each on two aircraft.

During the *summer*, when there are many double rotations to Barra, then one of the aircraft undertakes six sectors whilst the other undertakes four sectors.

On a very few days each year (estimated to be less than five) when the tidal window is particularly unfavourable, the double rotation is only achieved by both Twin Otters flying in parallel. A Saab will take over some of the other route responsibilities on those days.

When there is only one Twin Otter available the Saab will cover whatever is required to protect the Barra service. This often results in Tiree and some/all of the Campbeltown services being covered by a Saab.

Because of airport opening hours in the region it is rare for a Twin Otter and its crew to be able to complete more than six sectors in any duty day.

2.6 POTENTIAL AVAILABLE SPARE CAPACITY OF NEW TWIN OTTER AIRCRAFT

Upon closer examination it appears that there is next to no additional Twin Otter availability for route enhancements with the arrival of the new Twin Otter aircraft.

There should be some less downtime in engineering with the new aircraft. However, this is expected to be relatively short-lived (of the order of between two and five years). Further, this higher level of serviceability will only reduce the requirement of the Saab to operate the PSO flights, rather than offering real opportunities for flights to additional destinations.

Therefore, this study has looked more broadly for route enhancement possibilities. This was through considering aircraft other than the Twin Otter.

2.7 SAAB 340

2.7.1 The Aircraft

The Saab 340 is a discontinued Swedish two-engine turboprop aircraft. Its final third generation version, the 340B Plus, was delivered for service in 1994. One hundred of these were manufactured. It is operated in the Highlands & Islands by Loganair in a 34 seat configuration.

2.7.2 Potential Role in Creating Additional Capacity

If the Saab, or an equivalent aircraft, was used more comprehensively for the Campbeltown and Tiree services, then the Twin Otter's availability for additional tasks would be increased.

It would allow the two Twin Otters to be focussed on a number of Highlands & Islands STOL airports. In addition to Barra, this could include Skye (should the airport be brought into service) and/or Oban. These are airports that the Twin Otter is best suited for. (However, Loganair highlighted that there may well be a need for approved procedures and enhanced NAV Aids at Oban to permit scheduled services by a Twin Otter).

This could, for example, allow a morning and evening Glasgow-Skye service with daytime services to Barra as currently, although there is some potential timetable overlap. Alternatively, it could allow a morning and evening service between Glasgow and Oban with daytime services to Barra as currently.

The second aircraft would be available to cover the overlaps, act as a backup and to provide additional capacity to meet seasonal peaks in demand. Efforts are currently, and would need to continue to be, made to ensure that scheduled engineering inputs were focussed on quieter times of the year, wherever possible.

However, a single Twin Otter would find it impossible to provide a double rotation for either Skye or Oban and a double Barra rotation (i.e. eight sectors) within one day, although late night or early morning opening and nightime lighting is an option at (Skye or Oban) that might permit such a busy timetable. It would not be possible to use the Saab as all three airports require STOL aircraft operations.

The robustness of this system would thus be less than the current PSO arrangements. Consideration could be given to various back-up scenarios in circumstances where there was unscheduled withdrawals from service. It can be expected that priority would be given to Glasgow-Barra as an island with no land based alternative travel options.

2.7.3 Relative Operating Costs

The Saab 340 aircraft is larger and heavier than the Twin Otter. Therefore, its landing fees are higher. Under the current HIAL charging regime the Twin Otter would be charged £66. The Saab 340 would be charged £154 weight-related landing fees on intra-Scottish flights. At Glasgow Airport the comparable charges, from their published rates, would be around £33 and £65, respectively, for the Twin Otter and Saab.

The Saab aircraft is also expected to burn more fuel, something over twice the fuel for the same distance. However, the aircraft lease/purchase costs would be much less than the new Twin Otters-around $28,000 as opposed to the estimated $60,000 per month that is examined later.

Saab 340B maintenance costs, Nineteen 100 Aviation, estimate would also be higher (£492/Flight Hour) than for either the new Twin Otter 400 (£381) or an existing Twin Otter 310 (£472). However, the Saab will be travelling further in every hour operated.

It is likely, therefore, that the cost of using a Saab rather than a Twin Otter on the Campbeltown and Tiree services would not be dramatically different. This could, of course, be tested in a future tendering exercise for the Glasgow PSO services.

2.8 **BN2 ISLANDER**

2.8.1 Introduction

The BN-2 Islander was produced by Britten-Norman from 1963, with the emphasis on producing a rugged and durable aircraft that had good performance, low operating costs and was easy to maintain. By 1982, 1,000 had been delivered. Enhancements and options over the years enabled the Islander to keep evolving.

2.8.2 Speed and Capacity

As shown at **Figure 2.2**, earlier, the Islander is a slower aircraft than the Twin Otter. It has capacity for 8 passengers in the main cabin and one beside the pilot.

The weight and passenger capacity of the BN2 Islander aircraft is below that required to comply with the National Aviation Security Programme.

This leads to practical, straightforward and time-saving transfer of passengers and considerable financial saving on screening equipment.

2.8.3 Passenger Experience

The aircraft design results in a relatively noisy cabin experience for passengers. The consensus amongst consultees was that journeys over one hour in length become uncomfortable. Many air operators offer earplugs or ear defenders as an option to passengers to ameliorate this feature of the aircraft.

As an unpressurised aircraft the aircraft cannot take passengers too high, above the weather, and as a result the aircraft can deliver a bumpy ride in turbulent conditions. Scottish Air Ambulance removed the Islanders from its fleet in the early 2000s, partly due to the passenger experience that it offers. Their fleet currently comprises two Eurocopter EC 135 helicopters based in Glasgow and Inverness and two King Air 200c planes based in Aberdeen and Glasgow. In the summer of 2014 the two EC135 helicopters will be replaced with two EC145T2s.

2.8.4 Current Use of the Islander

The aircraft are operated on scheduled services in Scotland by:

- Direct Flight (internal Shetland PSOs).
- Hebridean Air Services (Oban-based PSOs).
- Loganair (internal Orkney PSOs).

Scilly Skybus operate the aircraft on commercial services between the Cornish mainland and the Isles of Scilly.

2.9 AIR SERVICE SUPPORT MECHANISMS

2.9.1 PSO

The PSO regulation gives clear criteria with regard to PSO eligibility. It only allows PSO on three types of routes:

- Routes to an airport serving a peripheral region.
- Routes to an airport serving a development region.
- Thin routes to any airport.

The relevant regulation states: "A Member State, following consultations ..... may impose a public service obligation in respect of scheduled air services between an airport in the Community and an airport serving a peripheral or development region in its territory or on a thin route to any airport on its territory any such route being **considered vital for the economic and social development of the region** which the airport serves."

There are various other aspects to the PSO designation. These include consideration of:

- Proportionality in terms of the public spend versus the benefit.

- Whether existing operators or other airports would object to a PSO as an unacceptable interference in the operation of markets.

- Surface transport alternatives such as road and rail. The UK Government historically, through their 2005 guidelines, has chosen to interpret this as meaning a PSO will only be considered where the alternative land journey is longer than three hours.

It should be noted that where the fixed costs of operations are essentially fully borne by the PSO sponsor, this can allow an operator to provide other services on a commercial basis. Examples of this-referred to earlier in the Chapter-are the Hebridean Airways' Islay service; and Loganair's provision of above-specification frequency and capacity to Tiree and Barra.

Any modification of the public service obligations after the award of the contract necessitates the launch of a new tender procedure. In other words the PSO cannot be changed mid-contract. Innovation therefore has to be timed and sequenced in line with contract renewal dates.

The summer Sunday flights between Glasgow and Campbeltown are being operated as a two-year trial in the current PSO contract. This offers Scottish Government the flexibility to either extend or suspend the service based upon uptake, without triggering a new tendering exercise.

Recent Transport Scotland statements underline aspects of Scottish Government's perspective on PSOs. In an April 2013 letter from Transport Scotland to the Public Petitions Committee it was stated that:

"*We have no further plans at this time to review the number and range of air services subject to PSOs in the Highlands and Islands.*"

and

"*We recognise the desire to see an expansion of air services in the Highlands and Islands but this desire must be balanced with the cost of such an expansion. While we are willing to discuss the possibility of additional PSO air services, this would be against the current background of financial constraint and an understanding that we are not prepared to take on any new funding commitments at this time.*"

2.9.2 Air Discount Scheme

The Scottish Air Discount Scheme (ADS) is managed by Transport Scotland. It provides discounted fares on eligible routes to people whose main residence is in Orkney, Shetland, the Western Isles, Islay, Colonsay, Jura, Caithness and north-west Sutherland. The scheme was recently extended to include Colonsay residents in the light of the new non-PSO service between Colonsay and Islay.

ADS was launched in 2006 to address the following issues:

- The Highlands & Islands are the most peripheral parts of Scotland. Social and economic exclusion is a problem.
- This is exacerbated by high air fares. These constrain demand and this discourages service enhancements.

- Increased demand will lead to increased frequency and capacity and could also bring new entrants to the market and create more competition.

ADS aims to tackle these issues by providing a discount of 40% on the core air fare on eligible routes and for eligible residents. All people 16 years and above can apply for membership. The scheme also includes students from these areas who are studying away from home. Those aged 15 or less can be included on a parent or guardian's membership card. There is no restriction on the number of trips per eligible person.

However ADS is not open to:

- Those living outside the relevant geographic areas.
- Flights on PSO services.
- Travel for business purposes
- NHS-funded travel.

Recently the Scottish Government extended the scheme to travel undertaken by volunteers and employees of third sector organisations.

2.9.3 <u>De Minimus Funding</u>

It is possible that some smaller route innovations could be trialled under the *de minimis* "state aid" regulation. This allows for aid of up to €200,000 to be provided from public funds to any business enterprise over a rolling three-year period.

This reflects the Commission's view that this financial ceiling neither materially affects trade between Member States, nor distorts competition. However the aid must not be combined with any other state aid during the period and thus exceed the ceiling by these means.

Loading a BN2 Islander

3 IDENTIFICATION OF ROUTES FOR DETAILED RESEARCH

3.1 APPROACH

3.1.1 Initial Generation and Sifting of Candidate Routes

An initial long list of potential routes was identified. This was based on:

- Those listed in the study brief.
- A review of the previous research studies, listed at **Appendix B**.
- Consultations with stakeholders (see **Appendix C**).
- Our own knowledge and previous experience.

A number of routes were ruled out because of a general expectation of lack of demand. These included a suggested inter-island link between **Barra and Skye**.

A central belt link between **Oban and Edinburgh** was ruled out in favour of taking forward one to/from Glasgow. This reflected:

- The views of most stakeholders.
- The results of a Facebook survey by Oban Airport. This indicated a much higher interest in a link with Glasgow.
- A review of 2009 CAA Passenger Survey data. They show that air passengers with a surface origin/destination in the Oban area make far greater use of Glasgow than Edinburgh.

Similarly, the findings from the stakeholder consultations and the 2009 CAA data also indicated quite limited demand for use of **Prestwick** for those travelling to/from the Oban area.

Both **Oban-Inverness** and **Skye-Inverness** were ruled out based on the consultation findings and expectation of limited demand.

Aberdeen-Oban was also ruled out due to stakeholder views and an expected lack of demand. In addition, this cross-country route would not be suited to the likely available aircraft (for the reasons explained in **Chapter 2**).

3.1.2 Criteria for Assessment of Candidate Routes

Introduction

From the above exercise seven potential routes were taken forward to the next stage. These routes are shown at **Table 3.1**, later. They were each assessed using the following criteria.

Supply

PSO Route Applicability

Each route was assessed in terms of its potential to attract a PSO designation.

This reflects the criteria discussed in **Chapter 2**, in particular:

- Being vital for the social and economic life of the region it would serve.
- Significant local, regional and national support.
- Quality of surface travel alternatives.
- Possibility of objections from existing air operators.

PSO Cost Versus Possible Demand

This reflects the proportionality between potential financial cost and expected passenger demand, as discussed in **Chapter 2**.

Passenger Comfort/Operational Considerations

Length of sector and turbulence could be significant issues for some routes. They could lead to uncomfortable passenger experience and, on occasion, greatly extended flight times.

Ease of Elaboration From Existing Routes

The cost and operational feasibility of new routes would be significantly improved if they can be delivered using existing aircraft and crew resources. Thus, they could be introduced on a largely or wholly marginal cost basis.

Infrastructure Requirements

This relates to the costs of introducing a new airport (i.e. Skye) or infrastructure investment at existing airports to enable a new service to operate.

Demand

Stakeholder Support

The stakeholder consultations pointed to the expected potential benefits of some routes more than others.

Referenced by Previous Studies

It was considered a plus point if a route had been mentioned or examined in previous studies. Where this was not the case it suggested weaker demand.

Existing Travel Demand

The viability of a route seems more likely where there is existing travel demand between two locations, rather than having to very largely create a new market.

Target Passenger Mix

How far is the route likely to have a broad mix of traffic types-private business, public sector, leisure, VFR and tourists. This would add to its potential viability and its range of wider benefits.

Initial View of Likely Demand

Based on our existing knowledge and experience, and the research to date, how strong or otherwise would demand appear to be.

3.2.3 Scoring System

A simple scoring system was applied to each criterion::

- Positive = 1.
- Neutral = 0.
- Negative = -1.

3.3 RESULTS

The results of the appraisal are shown at **Table 3.1**, over. Three of the routes scored a total of zero or less.

Kirkwall-Glasgow scored well in terms of demand. However, it scored poorly on supply side factors. These include the likelihood of a PSO because of the present commercial operation of a single daily rotation on the route and the provision of double daily Kirkwall-Edinburgh service.

The route was also seen as being difficult to deliver using the existing PSO aircraft and crew resources under consideration. Importantly, and as explained at **Chapter 2**, Twin Otter aircraft being deployed on the service are likely to produce a low quality passenger experience - while the service could face extended flight times in some weather conditions.

Oban-Benbecula scored much less well than Oban-Barra. This reflected expected lower levels of expected demand and, thus a high financial cost to deliver. Data from the Scottish Ferries Review suggest that relatively few Uist residents have Oban as a final destination for their trips. This is in a context where, we understand, there is a higher level of ferry traffic to/from Barra than to/from Lochboisdale. Perhaps as a consequence, Oban-Benbecula received less stakeholder support than Oban-Barra.

Third, **Campbeltown-Northern Ireland** scored poorly on a number of criteria. There is an expectation that a PSO designation would be difficult to justify, while the cost of financial support to provide such a service could be relatively high. In addition, the route would have to rely on as yet unproven demand.

3.4 ROUTES TAKEN FORWARD FOR DETAILED CONSIDERATION

The appraisal findings were discussed at a meeting with the client group. It was agreed that the routes to be taken forward for detailed analysis would include:

- Oban-Barra.
- Oban-Campbeltown.
- Oban-Glasgow.

Table 3.1: Appraisal Scoring

Routes →	Barra	Skye	Oban	Oban	Kirkwall	Oban	Campbeltown
↓Criteria	Oban	Glasgow	Glasgow	Campbeltown	Glasgow	Benbecula	Northern Ireland (weekend)
PSO route applicability	1	1	0	0	-1	1	-1
PSO cost versus possible demand	1	0	1	0	-1	-1	-1
Passenger comfort/operational considerations	1	0	1	1	-1	0	0
Ease of elaboration from existing routes	1	1	1	-1	-1	0	0
Infrastructure requirements	0	-1	0	1	1	1	1
Stakeholder support	1	1	1	0	0	-1	0
Referenced by previous studies	1	1	1	1	0	1	0
Existing travel demand	1	1	1	1	1	0	-1
Target passenger mix	0	1	0	0	1	0	-1
Likely demand	0	1	0	-1	1	-1	0
Score	7	6	6	2	0	0	-3

In addition consideration was to be given to:

- Potential enhancements to the existing Glasgow-Barra service, as per the study brief.
- How a Glasgow-Skye service-the subject of a recent detailed feasibility study-might be delivered using existing available aircraft capacity.

The analysis contained in **Chapter 2** was also discussed. On this basis, the client group agreed that the research should look beyond solely Twin Otter possibilities, to other aircraft types and route permutations.

The BN2 Islander at work in the west

4 POTENTIAL NEW ROUTE: OBAN-BARRA

4.1 EXISTING TRANSPORT PROVISION

4.1.1 Ferry Service-Summer (April-Mid-October)

The summer sees **eight return sailings per week**. Most (five) are direct between Oban and Castlebay. The other three are indirect, including calls at Lochboisdale (South Uist), or at Coll and Tiree.

The **crossing time** is around five hours (4h 50m) on the direct sailings. It is longer on indirect sailings-around seven hours.

In terms of **days** of operation, there are sailings from Oban every day of the week From Castlebay there are sailings each day apart from Saturday.

Departures from Oban are almost all in the afternoon-at 1340 or 1540. There no morning **arrivals** in Oban. They are at around 1400 or between 2200 and 2340.

All but one of the departures from Castlebay are before 0930, and as early as 0700. All arrivals at Barra are in the afternoon. Most are either between 1800 and 1830; or around 2030.

4.1.2 Ferry Service-Winter (Mid-October-March)

The ferry service frequency is reduced by 50% in the winter. There are **four return sailings per week** on the route. Most (three) are direct between Oban and Castlebay. The other two are via Lochboisdale.

As in the summer, the **crossing time** is around five hours (4h 50m) on the direct sailings. The winter indirect sailings take between around seven and nine hours.

In terms of **days** of operation, the service runs on four days per week in each direction. From Oban, this is on Tuesday, Thursday, Friday and Sunday. From Castlebay it is on Monday, Wednesday, Thursday and Friday. Thus, there are three days of the week when it's not possible to arrive on or depart from Barra on an Oban sailing.

There are no sailings in either direction on Saturday. Thus, all year round it is not possible to leave Barra by ferry on a Saturday.

Departures from Oban are mostly at 1540. There are a mix of **arrival** times in Oban-0600, 1335 and 2010.

Departures from Castlebay are a mix of morning (0845), afternoon (1520) and evening (2040). There are no morning arrivals at Castlebay. The earliest is around 1500, with most at 1950 or later.

4.1.3 Fares

The current single ferry fares are:

- Passenger: £13.85.
- Car £63.00

4.1.4 Estimated Passenger Volumes

Based on various sources we estimate that around 34,000 passengers per annum use the service. We would expect a majority of them to be visitors rather than residents.

While the ferry sails to/from Oban, that is not the final destination/ultimate origin for all passengers on the service. The 2010 Scottish Ferries Review household survey found that around 20% of Barra residents stated that Oban was the most frequency final destination for most of the trips they make off the island.

4.2 SUMMARY OF ONLINE SURVEY FINDINGS

4.2.1 Introduction

This section presents the key findings of the section of the online survey that covered a potential Oban-Barra service. The results are reported in full at **Appendix A**.

4.2.2 Personal Respondents

Existing Trip-Making

Some 87 of the 457 personal respondents to the overall online survey presently travel between Oban and Barra. The questionnaire defined these trips as where the respondent would be spending a number of hours to undertake activities in the Oban area, rather than simply travelling straight through to/from another place (e.g. Glasgow).

The current frequency of trip-making is limited. Those who travel between Oban and Barra make an average of 4.5 return trips per year. The trips are also markedly seasonal. Some 72% are in the summer (April-October), with 38% made in the three months of July and August alone.

The trips are not particularly short in duration. The vast majority (86%) involve at least two days at the destination. However, this will, to an extent, reflect the current timings and frequency of the Oban-Castlebay ferry service. VFR and Short break/holiday are the main trip purposes.

Value is attached to having one's own vehicle while making a trip. Most (63%) accompany a car on the ferry crossing.

Around three in four respondents identified at least one constraint on making trips between Oban and Barra. The main ones included the crossing time being too long or sailings not being at the right time/on the right day. This was mostly in relation to the summer timetable. This will reflect that this is when a clear majority of trips are currently made. Ferry fare levels were also reported as reducing the number of trips made.

Potential Demand At Various Fare Levels and Timetable Options

Respondents were asked whether they would be interested in using an air service between Oban and Barra.

This was qualified by stating that:

- Due to the tidal nature of the airstrip on Barra it would not be possible to make a day trip using the air service.
- Flights would depart either late morning or early afternoon depending on the tide.
- Flight time would be around 45 minutes.

Some 163 of the 457 respondents stated some interest in using an Oban-Barra flight. They were asked about the number of single trips per annum that they might make at various fare levels. The results are shown at **Table 4.1**.

TABLE 4.1: POTENTIAL TRIP-MAKING ON THE AIR SERVICE

One Way Fare	Number of Respondents Who Would Use The Service	Number of Single Trips Per Annum
£65	135	556
£85	50	190
£105	18	62
£125	13	41

Some 135 respondents would use the service at a one way fare of £65. However, demand drops sharply in response to a fare of £85. It does so again when the fare is increased to £105. There is much less effect in raising the fare to £125, although demand does fall again.

In each fare bracket, a significant proportion of users would make fewer than three return trips per year. Thus, within the survey respondents there is not a significant core of high frequency users that would help to sustain demand.

The responses indicate a high elasticity of demand. Each increase in fare results in a significant fall in demand and also a decrease in operator revenues.

Flight frequency would have only a limited impact on demand. Around three quarters of respondents stated that they would still make the same number of flights on the air service if it operated on only three days of the week.

The most popular days for the flights to operate were, in order, Friday, Monday and Saturday. There was little difference in these preferences between summer and winter.

As with present trip-making, demand would be seasonal. Some 40% stated that they would make the same number of trips in winter as in summer. However, most of the rest (48% of all respondents) said they would make most or all of the trips between April and September.

Nature of Trips on the Service

The service has the potential to generate new trips between Oban and Barra. Half of those interested in using the service said that all flights would be new trips. Only one in five stated that all their trips on the flight would be displaced from the ferry service.

There would also be quite limited displacive effects on the Glasgow-Barra air service. In particular, this is because more than half of those interested in the flights do not use the Glasgow-Barra link. Only one in five respondents expect that some or all of their flights to/from Oban to be in place of ones currently made on Glasgow-Barra.

4.2.3 Business Respondents

Introduction

There are similarities between the responses on behalf of businesses and those made on a personal basis. Therefore, the following analysis concentrates on the main differences between the results two groups.

Existing Trip-Making

Some 18 of the 70 business respondents to the overall online survey presently travel between Oban and Barra (as defined earlier). These respondents make an average of 5.7 return trips per year. There is no significant difference in trip-making between the summer and winter months.

Value is very clearly attached to having one's own vehicle while making a trip. Almost all (92%) accompany a vehicle on the ferry crossing.

The main constraints on trip-making include the crossing time being too long, and also sailings not being at the right time/on the right day. This applies to both the summer and winter timetables. In addition, long gaps between outward and return sailings in the winter timetable was a prominent constraint.

Potential Demand At Various Fare Levels and Timetable Options

Respondents were asked whether they would be interested in using an air service between Oban and Barra. Some 32 of the 70 respondents stated some interest.

They were asked about the number of single trips per annum that they might make at various fare levels. The results are shown at **Table 4.2**.

TABLE 4.2: POTENTIAL TRIP-MAKING ON THE AIR SERVICE

One Way Fare	Number of Respondents Who Would Use The Service	Number of Single Trips Per Annum
£65	26	126
£85	17	72
£105	8	34
£125	6	23

Of the 32 individuals who had stated that they would be interested in using the service, 26 would do so at a one way fare of £65. Demand drops quite sharply in response to a fare of £85. It does so again when the fare is increased to £105. There is much less effect in raising the fare to £125, although demand does fall again.

The responses indicate elasticity of demand, although less so than for the personal respondents. Even so, in both groups each increase in fare produces a significant fall in demand and a resultant decrease in operator revenues.

In each fare bracket, a significant proportion of users would make fewer than three return trips per year. Thus, within the survey respondents there is not a significant core of high frequency users that would help to sustain demand.

Flight frequency would have some impact on demand. Just over half (56%) of respondents stated that they would still make the same number of flights on the air service if it ran on only three days of the week. However, almost all the others (41%) stated they would reduce their number of flights by up to half.

The most popular days for the flights to operate were Monday and Friday. In general, the preference was for flights on the first three days of the week.

The seasonal profile would be different to that of personal respondents. Some 44% stated that they would make the same number of trips in winter as in summer. While one third said they would make most or all of the trips between April and September, around one in five stated that they would make most of their flights in winter.

Nature of Trips on the Service

The service has the potential to generate new trips between Oban and Barra. Half of those interested in using the service said that all flights would be new trips. Only 13% stated that all their trips on the flight would be displaced from the ferry service.

4.3 HEALTH-RELATED TRAFFIC

NHS Western Isles were not available for a consultation; nor did they provide data on current NHS-related passenger movements to/from locations outside their area. The following analysis is based on our team's experience and knowledge of the relevant issues.

The Charter of Patient Rights & Responsibilities from the Patient Rights (Scotland) Act 2011 means that most patients should start their treatment within 18 weeks of their GP referring them.

In addition, the Treatment Time Guarantee states that "you must be treated within 12 weeks of being diagnosed and agreeing to inpatient or day case treatment". If this time is exceeded then people have the right to seek the treatment outwith their Health Board or their Health Board's arrangements with other Boards (such as NHS Greater Glasgow in the case of NHS Highland and NHS Western Isles patients).

Financial constraints in the health service are increasing pressure to coordinate activity within the existing Board boundaries, and within the Service Level Agreements (SLAs) with the likes of NHS Greater Glasgow for Barra and the Oban and Campbeltown areas.

In remote and rural provision of healthcare, a balance has to be struck between:

- Achieving a sufficient volume of patients locally to maintain local staff skill levels; and
- Properly identifying when patients should be transferred to tertiary centres.

In previous discussions NHS Western Isles have indicated that they would look to repatriate more activity from Barra-Glasgow to Barra-Stornoway.

However, a Barra-Oban flight would give them another option, including, possibly, the option of passengers using air to travel in one direction and ferry in the other.

There could be merit in NHS Western Isles considering sending some of the patients it currently sends to Glasgow to Oban instead. However, there would need to be a sufficient number of patients diverted to Oban to lead to a fall in the cost of NHS Western Isles' SLA with NHS Greater Glasgow. Also, it is untested as to whether Barra residents would support such a move. Additionally the feedback on NHS practices received in relation to Oban-Campbeltown route (below) does not suggest that such usage would be significant. Finally any switching of patients from Glasgow to Oban is, of course, likely to divert passengers from the Barra-Glasgow PSO air service.

4.4 DEMAND ANALYSIS

4.4.1 Introduction

This section draws on the information collected for the study to assess potential demand for an Oban-Barra air service. This needs to be seen in the context of, as noted earlier, a lack of available information on potential health-related traffic.

The analysis includes key findings of the online survey. That has provided a considerable amount of information on existing travel and the nature of potential demand. However, there are a number of generally recognised limitations to the use of the results of such a survey. These include:

- Survey participants are more likely to be interested in/potential users of an air service than the general population.
- Importantly, respondents' stated intentions of potential use will overestimate their actual use of the service.
- The survey did not cover potential inbound traffic as extensively as outbound traffic-notably the wider visitor market.

As noted at **Chapter 1**, it was recognised at the outset that the demand assessments were to be high level; and that further research would be required if any of the identified route options are pursued.

4.4.2 Positive Evidence For Potential Demand

Some of the evidence collected for the study can be taken as positive indications of potential demand for an Oban-Barra air service:

- Positive evidence of potential demand from the internet survey.
- A base of existing Oban-Barra traffic. This is an estimated 34,000 passenger movements per annum on the ferry, with Oban being the most common final destination of trips for around 20% of Barra residents.
- A long surface journey by ferry of-between 4 hours and 50 minutes and over 7 hours. The internet survey shows journey time as the main current constraint on making trips.
- Gaps in the ferry timetable. This is notably Saturdays all year round. Gaps also include those on a number of days in the winter.
- The internet survey results suggest that a three day per week service could be run without incurring a proportionate decrease in demand.

4.4.3 Less Positive Evidence For Potential Demand

Some of the evidence collected for the study can be taken as less positive indications of potential demand:

- Very limited willingness to pay above the base (£65) single fare-by both personal and business respondents.
- Quite a high degree of dependency on generating new trips. Some 50% said that all their potential flights on the service would be new ones between Oban and Barra.
- Apparent value attached to accompanying a vehicle on current trips. This may serve to depress air demand-especially for business users.
- The internet survey suggests that demand could be quite low in winter, despite reduced ferry service frequency at that time.

4.4.4 Oban-Tiree Air Service Comparator

The Oban-Tiree air service carries slightly over 1,000 passengers per annum. The position of Tiree and Barra are analogous in some respects:

- Broadly similar population levels, although Barra's is around 200 greater.
- Both islands have a PSO air service to Glasgow.
- Their ferry services are similar in terms of frequency, although crossing times to Barra are longer. (However, Ferries Review survey data show that Oban is a more important final destination for Tiree residents than for those living on Barra).
- Ferry passenger numbers to/from Oban are similar and we would expect a comparable resident: visitor split.
- Ferry fares are broadly similar. Those for Barra are higher, but not markedly so in absolute terms-specially those for passengers.

Fares charged on the Oban-Tiree air service are similar to the lowest single one-way fare (£65) that the online survey tested for an Oban-Barra service. However, there are a number of prospective differences between the two services, in that Oban-Tiree:

- Operates on only two days of the week (both weekdays).
- Provides a day trip opportunity in both directions.
- Has a distinctive passenger profile. It appears that Argyll and Bute Council and NHS traffic are important components of demand. In contrast, the Barra service could attract many more non-landing sightseers passengers, because of the beach landing.

4.5 OPERATIONAL CONSIDERATIONS

4.5.1 Using a Scottish Government Twin Otter

Chapter 2 showed that the ability to provide additional air services such as Oban-Barra with a Twin Otter is severely restricted. This is especially the case in the summer because of the additional flights operated on the Glasgow-Barra service. Our

research indicates that Barra residents would not want to see an Oban-Barra service introduced at the cost of a reduced Glasgow-Barra service.

Thus, the only apparent possibility would be to fit in an Oban rotation from Barra on days when there was only a single Barra rotation from Glasgow. That could be on weekdays and Saturday in the winter and on Tuesday, Wednesday and Sunday in the summer. This approach would, of course, remove the potential to increase services between Glasgow and Barra, another option that has been considered in this study.

Another issue is the additional cost and approvals required to permit scheduled Twin Otter services into Oban airport. Loganair indicated that to be able to accomplish this in Instrument Meteorological Conditions (IMC) would require additional NAV Aids and procedures developed for Oban Airport. They also mentioned Stepped ILS and steep approach procedures and commercial rules Instrument Flight Rules (IFR) compliance. In other words some additional equipment, approvals and efforts are required before scheduled services with a Twin Otter could be commenced.

Oban Airport and Argyll and Bute Council have undertaken some detailed work on this issue. The current PSO operator apparently has already received a quotation for having localizer performance with vertical guidance (LPV) procedures written up. The operator would also be required to have the necessary navigation equipment on board.

We are aware that work is currently being undertaken by HIAL in conjunction with the CAA on GNSS approach procedures. This could provide an opportunity to achieve the benefits of instrument assisted approaches but with substantially less onerous airfield development requirements.

In theory, this could mean Oban might face no associated infrastructure costs *unless* the CAA view Oban as requiring a precision landing.

4.5.2 Using An Islander

These considerations associated with the use of a Twin Otter on the route, led us to consider the possibility of using a BN2 Islander to provide an Oban-Barra-Oban service.

It appears that if use was made of the Islander that operates the Oban PSO services then an Oban-Barra service could be established using the PSO aircraft, crew and engineering support: that is, without occurring additional fixed costs.

A total all-in cost for an all year round service (on, say, 5 days per week) could be of the order of £250,000 for a year round service. However if the service was only run for the 16 week summer months then this cost could be reduced to around £80,000 based upon an approximate pro rata adjustment of 16/52.

Income from passengers should reduce this outlay further. Assuming an ambitious 50% load factor (as non-landing sightseers might also be attracted given the opportunity to land on Barra beach) and an average yield of £40 per sector, gives an approximate income of around £29,000 revenue.

This approach has several advantages:

- A summer only service will trial the route at the most favourable time of the year in terms of demand.
- The route will be trialled in the more favourable light and weather conditions of summer minimising any potential knock-on disruptions to other existing services.
- The service could be trialled under de minimis rules given the level of deficit that would be incurred. This innovation would not have to await the next break in the Oban services PSO contract.
- No significant new commitments to equipment, staff or regulatory approvals are required.

An indicative timetable is shown at **Appendix E**.

Oban Airport terminal

5 POTENTIAL NEW ROUTE: OBAN-CAMPBELTOWN

5.1 EXISTING TRANSPORT PROVISION

5.1.1 Car Journey

AA Route Planner shows a road distance of 87 miles between Oban and Campbeltown, with a drive time of 2 hours and 19 minutes.

5.1.2 Bus Services

There are no direct services between Oban and Campbeltown. Journeys between the two towns involve a change of bus en route.

At July 2013, there are four return services per day Monday-Saturday, with three on Sunday. The journey time ranges between 3h 27m and 4h 12 m on six days of the week. It can be as long as around 5 hours on Sundays.

At Oban, the first **departure** is at 0915 and the last at 1815. The first **arrival** in the town is at 1030 and the last at 2055.

At Campbeltown, the first departure is at 0630 and the last at 1700. The first arrival in Campbeltown is at 1327 and the last at 2204.

5.2 SUMMARY OF ONLINE SURVEY FINDINGS

5.2.1 Introduction

This section presents the key findings of the part of the online survey covering a potential Oban-Campbeltown service. The results are reported in full at **Appendix A**.

5.2.2 Personal Respondents

Existing Trip-Making

Some 42 of the 457 personal respondents to the overall online survey presently travel between Oban and Campbeltown. They make an average of 11.3 return trips per year.

The trips are quite seasonal. More than two thirds (70%) are made in the summer (April-October).

The trips are generally short in duration. A majority (60%) involve a working day or less at the destination. The other 40% last no more than 1 or 2 days.

Almost all (95%) of the respondents travel by road vehicle. The other 5% use public transport.

Even among these personal respondents business travel dominates. Around two thirds make some business trips between Oban and Campbeltown, while for three quarters it is the most common purpose (followed by shopping-11% of respondents).

A relatively low proportion (55%) identified at least one constraint on making trips between Oban and Campbeltown. "Journey takes too long" was very clearly the main one. It was the most common constraint for the vast majority (88%).

Potential Demand At Various Fare Levels and Timetable Options

Respondents were asked whether they would be interested in using an air service between Oban and Campbeltown, with a flight time of around 50 minutes. They were asked about the number of single trips per annum that they might make at various fare levels. The results are shown at **Table 5.1**.

TABLE 5.1: POTENTIAL TRIP-MAKING ON THE AIR SERVICE

One Way Fare	Number of Respondents Who Would Use The Service	Number of Single Trips Per Annum
£65	47	234
£85	8	25
£105	3	10
£125	2	8

Some 47 individuals stated they would use the service at a one way fare of £65. However, demand drops dramatically when the fare is increased to £85 or above, with revenues to the operator at their highest under the lowest fare.

Flight frequency would have only a limited impact on demand. Approaching three quarters (72%) of respondents stated that they would still make the same number of flights on the service if it operated on only three days of the week.

The most popular days for the flights to operate were, in order; Friday; Monday and Tuesday or Wednesday. There was little difference in preferences between summer and winter.

There is very little demand for flights between 1000 and 1500. The clear preference is for ex Oban flights to be before 1000-and largely before 0900; with ex Campbeltown flights to be from 1500 onwards-largely after 1700. Based on the survey responses it would appear that most of the demand for an Oban-Campbeltown service would originate in the Oban area.

Demand is sensitive to the number of rotations per day. Respondents were asked to consider the effect on their potential use if only a single rotation was made-i.e. a day trip was not possible. More than half (59%) said that this would reduce the number of flights that they might make. Within this, over one in four (28%) of all potential users stated that they would not use the service if it did not permit a day trip.

As with present trip-making, demand would be seasonal. More than half (54%) stated that they would make the same number of trips in winter as in summer. However, most of the rest (40% of all respondents) said they would make most or all of the trips between April and September.

Nature of Trips on the Service

The service has the potential to generate some new trips between Oban and Campbeltown.

Around one in three of those interested in using the service said that all flights would be new trips. However, slightly more (37%) stated that the air trips would be displaced from surface transport.

There would be very limited displacive effects on the Glasgow-Campbeltown PSO air route. This is largely because the vast majority (around 80%) of those interested in the new route do not use the Glasgow-Campbeltown flights. Only 6% expect that some or all of their flights to/from Oban to be in place of ones currently made on Glasgow-Campbeltown.

5.2.3 Business Respondents

Introduction

There are some similarities between the responses made on behalf of businesses and those made in a personal capacity. Therefore, the following analysis concentrates on key differences between the two groups.

Existing Trip-Making

Some 17 of the 70 business respondents to the overall online survey presently travel between Oban and Campbeltown. They make an average of 13 return trips per year.

The trips are generally short in duration. Around half (53%) involve a working day or less at the destination. All the others (47% of respondents) last only 1 day.

A relatively low proportion (36%) identified constraints on making trips between Oban and Campbeltown. In each case the constraint was "Journey takes too long".

Potential Demand At Various Fare Levels and Timetable Options

Respondents were asked whether they would be interested in using an air service between Oban and Campbeltown. They were asked about the number of single trips per annum that they might make at various fare levels. The results are shown at **Table 5.2**.

TABLE 5.2: POTENTIAL TRIP-MAKING ON THE AIR SERVICE

One Way Fare	Number of Respondents Who Would Use The Service	Number of Single Trips Per Annum
£65	8	105
£85	3	30
£105	2	14
£125	2	14

Some 8 individuals stated they would use the service at a one way fare of £65. However, demand drops significantly when the fare is increased to £85 or above, with revenues to the operator at their highest under the lowest fare.

The most popular days for the flights to operate were, in order, Monday and Sunday. There was little difference in preferences between summer and winter.

There is very little demand for flights between 1000 and 1600. The clear preference is for flights ex Oban to be before 1000 with ex Campbeltown flights to be from 1600 onwards. The results suggest that most demand-at least among our survey respondents-appears to originate in the Oban rather than Campbeltown area.

Demand is sensitive to the number of rotations per day. Respondents were asked to consider the effect on their potential use if only a single rotation was made-i.e. a day trip was not possible. Some 44% said that they would not use the service if that was the case.

Demand would not be particularly seasonal. Two thirds (67%) stated that they would make the same number of trips in winter as in summer. However, most of the rest (22% of all respondents) said they would make most or all of the trips between April and September.

Nature of Trips on the Service

The service has the potential to generate some new trips between Oban and Campbeltown. One in five of those interested in using the service said that all flights would be new trips. A further 40% said that *some* of their flights would be in place of existing surface trips.

There would be very limited displacive effects on the Glasgow-Campbeltown PSO air route. This is largely because the vast majority (around 80%) of those interested in the new route do not use the Glasgow-Campbeltown flights. Only 6% expect that some or all of their flights to/from Oban to be in place of ones currently made on Glasgow-Campbeltown.

The results also suggest that there would be no displacement of business respondents' trips from the Glasgow-Campbeltown PSO air service.

5.3 HEALTH-RELATED TRAFFIC

The NHS Argyll and Bute CHP Director of Operations concluded that the establishment of an air link between Oban and Campbeltown would be unlikely to have any material impact on bringing activity back from NHS Glasgow to NHS Highland as:-

- Admission Specialities available in Oban re Inpatient and Day Case (primarily planned or elective activity) are assessed by Kintyre residents now i.e General Surgery, Medicine and Pain clinic.
- Admission Specialities in NHS Greater Glasgow and Clyde (CG&C) are assessed by Kintyre population as they are not available from LIH Oban and will not be in the foreseeable future as they are not part of the core function of rural general hospitals.
- Visiting outpatient specialities to Oban from NHS GC&C are on the whole replicated in visiting clinics at Campbeltown hospital.

It should also not be forgotten that if there was any use of the service by the NHS, it is likely that a high proportion of any such traffic would be displaced from the Glasgow-Campbeltown PSO service.

5.4 DEMAND ANALYSIS

5.4.1 Introduction

This section draws on the information collected for the study to assess potential demand for an Oban-Campbeltown air service. This needs to be seen in the context of, as noted earlier, a lack of available information on potential health-related traffic.

The analysis includes key findings of the online survey. That has provided a considerable amount of information on existing travel and the nature of potential demand. However, there are a number of generally recognised limitations to the use of the results of such a survey. These include:

- Survey participants are more likely to be interested in/potential users of an air service than the general population.
- Importantly, respondents' stated intentions of potential use will overestimate their actual use of the service.
- The survey did not cover potential inbound traffic as extensively as outbound traffic-notably the wider visitor market.

As noted at **Chapter 1**, it was recognised at the outset that the demand assessments were to be high level; and that further research would be required if any of the identified route options are pursued.

5.4.2 Positive Evidence For Potential Demand

Some of the evidence collected for the study can be taken as positive indications of potential demand for an Oban-Campbeltown air service:

- "Journey time too long" is the main constraint on making trips between Oban and Campbeltown. This would be addressed by providing an air service.
- Relatively high percentage of potential business use. In theory business passengers should: be willing to pay higher fares; particularly value the reduced journey time; have less seasonal demand than personal travellers.
- Current public transport involves long and indirect journeys.
- The internet survey results suggest that a three day per week service could be run without incurring a proportionate decrease in demand. However, the selected days would need to reflect that many trips would be of short duration.

5.4.3 Less Positive Evidence For Potential Demand

Some of the evidence collected for the study can be taken as less positive indications of potential demand:

- Limited evidence of interest/demand from the internet survey.
- Very limited willingness to pay above the base (£65) single fare-by both personal and business respondents.

- Journey time by car is less than 2½ hours-and car is the dominant means of travel, based on the internet survey. This reduces the absolute journey time saving of an air service.
- A relatively low proportion of internet survey respondents identified constraints on making trips between Oban and Campbeltown.
- Demand appears likely to be imbalanced, depending largely on passengers based at the Oban end of the route.
- Quite a lot of demand may depend on a double daily service.
- A degree of dependence on generated trips. Some 33% of personal, and 20% of business, respondents stated that all their trips on the service would be new ones between Oban and Campbeltown.

5.5 OPERATIONAL CONSIDERATIONS

5.5.1 Using a Scottish Government Twin Otter

Our review of available aircraft capacity indicates that an Oban-Campbeltown route is almost impossible to fulfil with a Twin Otter under any foreseeable circumstances.

A significant proportion of demand is likely to be business traffic requiring a morning and evening service, originating out of Oban quite early. This could be achieved in two ways.

1

A Scottish Government Twin Otter based in Oban. Our research has established that would face the following issues:

- Resistance from the air operator, because of logistical and other complications with a dual based aircraft system.
- The likelihood of resistance from Transport Scotland as it would reduce the responsiveness and flexibility for the Glasgow PSO services - for which the Twin Otters are specifically being purchased - by having an aircraft 'out of position'.
- Potential additional costs of £100,000 per annum to cover crew hotel accommodation and per diems.

2

If a Glasgow-Oban service operated then a Glasgow-Oban-Campbeltown-Oban-Glasgow schedule could be run. However, this would mean that the first southbound flight ex Oban would be at a time that would be unattractive to much of its potential market.

5.5.2 Using An Islander

The online survey demonstrated that the service would only be attractive if it was a double daily, ideally originating out of Oban.

It seems inevitable that this would require a second Islander to undertake the service rather than piggy backing on existing manpower and equipment based at Oban airport.

The costs of the innovation will therefore rise steeply. If we assume that an Islander operation is in the region of £300,000-£350,000 per annum, then a new Islander operation to deliver Oban-Campbeltown would be of that order.

We are not convinced there is significant other demand or adequate resource to develop and support this service. NHS Highland do not anticipate potential health-related demand. This is further complicated by the fact that an aircraft and support crew cannot be easily turned on and turned off for a short life trialling of the route.

6 POTENTIAL NEW ROUTE: OBAN-GLASGOW

6.1 EXISTING TRANSPORT PROVISION

6.1.1 Road

AA Route Planner shows a road distance of 97 miles between Oban and Glasgow, with a drive time of 2 hours and 11 minutes.

6.1.2 Rail Services

Timetable

The rail journey time between Oban and Glasgow Queen Street Stations varies between 3 hours and 3 hours 30 minutes.

The current frequency of service is 3 return journeys Monday-Friday and 1 return on Sunday, all year round. On summer Saturdays there are four return services, with three (as per Monday-Friday) operating on winter Saturdays.

The frequent will increase considerably in May 2014. This will be from three to six return train services, Monday-Saturday. This will include pre-0900 arrivals at both Oban and Glasgow Queen Street.

Fares

Current fares range between £14.50 and £22.40 for a single leg journey between Oban and Glasgow. Additional discounts are available for residents who hold a *Highland Railcard*.

Passenger Volumes

ORR data show 126,000 passenger trips to/from Oban in 2011-2012. We would expect that most of these will be trips to/from Glasgow Queen Street rather than other stations on the line.

6.1.3 Bus Services

Bus services between Oban and Glasgow are a mix of direct and ones which involve a change of service en route.

As of July 2013 there are eight return services per day Monday-Saturday, and six returns on Sunday. Journey times are between 2h 45m and 3h on direct services; and 2h 51m and over 4 hours on indirect services.

Monday-Saturday, there are the same number (four) of direct and indirect services. On Sunday most (four) of the six services are direct.

At Oban, the first **departure** is at 0745 and the last at 1815. The first **arrival** in the town is at 1030 and the last at 2055.

From Glasgow, the first departure is at 0635 and the last at 1800. The first arrival in the city is at 1030 and the last at 2106.

6.1.4 Oban Area Air Passenger Traffic Using Glasgow Airport

There is presently no scheduled air service between Oban and Glasgow. However, a number of those travelling to/from the Oban area use Glasgow Airport as part of longer distance trips. As such, they are part of the potential market for an Oban-Glasgow service.

CAA Passenger Survey data suggest that in 2009 31,695 passengers flying to/from Glasgow airport had a surface origin or destination in the Oban area (i.e. in the PA32-P38 postcode area). Analysis of these passengers show that they are:

- Almost all (29,900 passengers) are residents of the Oban area rather than travelling inbound from elsewhere.
- Most are travelling for leisure purposes (26,000 passengers) rather than on business (5,700). Almost all passengers outbound from the Oban area, only 1,800 inbound to the area.

Table 6.1 provides a more detailed profile of these passengers.

TABLE 6.1: PASSENGERS USING GLASGOW AIRPORT WITH SURFACE ORIGIN/DESTINATION IN OBAN AREA

Traffic Type	Share
Business	18%
Leisure	82%
Inbound	6%
Outbound	94%
Inbound-Business	3%
Inbound-Leisure	3%
Outbound-Business	15%
Outbound-Leisure	79%

The volumes are dominated by outbound leisure trips. These account for almost 80% of the passengers. The remaining passengers are also largely outbound travellers.

Our consultations indicated that an estimated 35 frequent travellers in The Scottish Association for Marine Science (SAMS) undertook 182 flights during the last year. Three quarters of their flights used Glasgow whilst the balance were using Edinburgh airport. Consultees also suggest a similar number of inbound journeys to the Oban area-using flight for part of the journey-to use marina and similar facilties in the area. The SAMS flights had a wide range of final destinations, both in and beyond the UK.

Loch Lomond Seaplane ran an air service linking the River Clyde in central Glasgow and Oban harbour between 2007 to 2009 with a 9 seater amphibious Cessna 208 Caravan. The service ran for between seven and eight months each year and was popular.

Exact figures were not made available to the study, but estimates of over 8,000 single passengers annually were offered (tickets were sold only as returns at £149). Equal business and tourist use were also estimated by Loch Lomond Seaplanes, and they reported the service had very high occupancy levels.

However the difference of product between an iconic river to harbour journey in a seaplane, as opposed to an airport to airport journey in a terrestrial aircraft cautions a simple transfer of these estimates to this analysis.

Loch Lomond seaplane taking off from Glasgow
(screengrab from recent VisitScotland advertisement)

6.2 SUMMARY OF ONLINE SURVEY FINDINGS

6.2.1 Introduction

This section presents the key findings of the part of the online survey covering a potential Oban-Glasgow service. The results are reported in full at **Appendix A**.

6.2.2 Personal Respondents

Existing Trip-Making

Some 190 of the 457 personal respondents to the overall online survey presently travel between Oban and Glasgow (including ultimate origins and destinations beyond). They make an average of 14 return trips per year. These trips are quite seasonal. Two thirds are made in the summer (April-October).

The trips vary in their duration. Around one three respondents usually spend up to 1 day at their destination. In contrast, 43% spend three or more days there. VFR, Short break/holiday and Business are the main trip purposes.

Three quarters usually make the trip by car. The rest usually use public transport.

Slightly more than half (58%) identified at least one constraint on making trips between Oban and Glasgow. The main one was clearly that "the journey takes too long". This was identified by more than half the respondents, with a similar amount identifying it as the most common constraint.

A smaller amount (25%) identified the public transport timetable as their most common constraint. There were also references to public transport fares (11%) and inability to make a day trip (10%).

Potential Demand At Various Fare Levels and Timetable Options

Respondents were asked whether they would be interested in using an air service between Oban and Glasgow, with a flight time of around 40 minutes. Some 166 of the 457 respondents stated some interest in using it.

They were asked about the number of single trips per annum that they might make at various fare levels. The results are shown at **Table 6.2**.

TABLE 6.2: POTENTIAL TRIP-MAKING ON THE AIR SERVICE

One Way Fare	Number of Respondents Who Would Use The Service	Number of Single Trips Per Annum
£65	149	1,097
£85	49	368
£105	21	72
£125	13	26

At a £65 single fare, the vast majority of the 166 who had expressed interest in using the service would make some trips on the service. This was at a simple average of three-four return flights per year.

Demand falls very sharply when the fare is increased to £85 or beyond. The proportionate decrease in trips is greater than the proportionate increase in fares. Thus, the operator would lose revenues at the higher fare bands compared to the £65 single fare level. The responses indicate a high elasticity of demand.

In each fare bracket, a significant proportion of users would make fewer than three return trips per year. Thus, within the survey respondents there is not a significant core of high frequency users that would help to sustain demand.

Flight frequency would have some impact on demand. Most (52%) would make fewer flights on the service if it operated on only three days per week. Of these a majority (equal to 39% of all respondents) would reduce the number of flights by up to half. However, only 2% would not use the service at all.

The most popular days for the flights to operate were, in order: Friday; Monday; and Saturday/Sunday.

There is some demand for flights between 1000 and 1500. However, the main demand is for departures from Oban up to 0900 and, to a slightly lesser extent, departures from Glasgow from 1600 onwards-and particularly post-1700.

Desired flight times will be influenced, to an extent, by a need to connect with other flights at Glasgow. Three quarters would be looking to connect on at least some occasions. Around one in three would be looking to do so on *most* of their flights to/from Oban.

The ability to make a day trip using the service is not a major influence on the desire to use the service. More than half (60%) of respondents stated that they would still make the same number of flights if only a single rotation was operated.

Around one in five (21%) would reduce the number of flights by up to one half. The same amount would either make less than half their desired number of flights, or not use the service at all.

Demand would not be especially seasonal. Around three quarters of respondents stated that they would make the same number of trips in winter as in summer. Most others stated that they would make most or all of their trips between April and September.

Nature of Trips on the Service

The service appears to have only limited potential to generate new trips between Oban and Glasgow. Just 13% of those interested in using the service said that all their flights would be new trips. In contrast, 30% said that all flights would be existing trips currently made by surface transport.

6.2.3 Business Respondents

Introduction

There are some similarities between the responses on behalf of businesses and those made on a personal basis. Therefore, the following analysis concentrates on key differences between the two groups.

Existing Trip-Making

Some 38 of the 70 business respondents to the overall online survey presently travel between Oban and Glasgow (including ultimate origins and destinations beyond). They make an average of 17 return trips per year. These trips are somewhat seasonal. A majority (62%) are made in the summer (April-October).

The trips vary in their duration. More than half involve either a working day or less at the destination (22%), or 1 day (30%). Almost all the rest are between 2 and 7 days.

The vast majority (84%) usually make the trip by car. The rest usually use public transport.

Less than half (43%) identified at least one constraint on making trips between Oban and Glasgow. The main one was clearly that "the journey takes too long". This was identified by more than half the respondents, with three quarters identifying it as the most common constraint.

Potential Demand At Various Fare Levels and Timetable Options

Respondents were asked whether they would be interested in using an air service between Oban and Glasgow. Some 30 of the 70 business respondents indicated interest in doing so.

They were asked about the number of single trips per annum that they might make at various fare levels. The results are shown at **Table 6.3**.

TABLE 6.3: POTENTIAL TRIP-MAKING ON THE AIR SERVICE

One Way Fare	Number of Respondents Who Would Use The Service	Number of Single Trips Per Annum
£65	26	319
£85	16	153
£105	9	70
£125	9	70

At a £65 single fare, the vast majority of the 30 respondents who had expressed interest in using the service would make some trips on the service. Their frequency would be a simple average of around six return flights per year.

Demand falls very sharply when the fare is increased to £85 or beyond. The proportionate decrease in trips is greater than the proportionate increase in fares. Thus, the operator would lose revenues at the higher fare bands compared to the £65 single fare level.

For each fare band, the majority of respondents would make no more than three return flights per year on the service. Thus, overall demand would be quite reliant on a small core of frequent flyers.

If a three day per week service was introduced the most popular days for the flights to operate would be, in order, Monday, then Tuesday, with some lesser demand for Wednesday and Friday.

Demand is very strongly for flights to operate outside office hours. Clear preference was expressed for an 0700-0800 departure ex Oban and a flight ex Glasgow between 1700 and 1900.

Desired flight times will be influenced, to an extent, by the need to connect with other flights at Glasgow. More than two thirds (71%) would be looking to connect on at least some occasions.

The ability to make a day trip using the service is not a major influence on the desire to use it. Slightly more than half (56%) of the respondents stated that they would still make the same number of flights if only a single rotation was operated.

Around one in three (30%) would reduce the number of flights by up to one half. A further 11% would not use the service at all.

Nature of Trips on the Service

The service appears to have only limited potential to generate new trips between Oban and Glasgow. Just 4% of those interested in using the service said that all of their flights would be new trips. In contrast, 37% said that all their flights would be existing trips currently made by surface transport.

6.3 HEALTH-RELATED TRAFFIC

As noted at **Chapter 5**, we had a useful consultation with NHS Highland. However, they did not provide us with estimates on the numbers of patients and staff who might be affected by the introduction of an Oban-Glasgow flight.

The Lorn and the Islands Hospital in Oban is a Rural General Hospital. It provides A&E, minor injuries, medical, chemotherapy, surgical and maternity services; it also provides care for the elderly.

With eight resident consultants at the hospital, it can meet a wide set of needs. There are also visiting consultants from Glasgow.

Those requiring more specialist treatment will travel to Glasgow. Patients choose whether to travel by road, rail or bus, and the cost is met by the Highlands & Islands Patient Travel Scheme. However, they are encouraged to drive, which then gives them the flexibility of returning at any time when they are able. It also means that the Health Board do not have to pay the cost of overnight accommodation.

There will be patients who are eligible (for medical reasons) for ambulance transport for the journey.

An air service between Oban and Glasgow could be used by visiting consultants, and by patients travelling to Glasgow for specialist treatments. The services would need to be timed to meet appointment times, particularly for day cases. The benefits would be a reduction in travel time for patients; and possibly fewer overnight stays required.

However data is not available to this study that would allow us to quantify potential NHS related passenger numbers.

6.4 DEMAND ANALYSIS

6.4.1 Introduction

This section draws on the information collected for the study to assess potential demand for an Oban-Glasgow air service. This needs to be seen in the context of, as noted earlier, a lack of available information on potential health-related traffic.

The analysis includes key findings of the online survey. That has provided a considerable amount of information on existing travel and the nature of potential demand. However, there are a number of generally recognised limitations to the use of the results of such a survey. These include:

- Survey participants are more likely to be interested in/potential users of an air service than the general population.
- Importantly, respondents' stated intentions of potential use will overestimate their actual use of the service.
- The survey did not cover potential inbound traffic as extensively as outbound traffic-notably the wider visitor market.

As noted at **Chapter 1**, it was recognised at the outset that the demand assessments were to be high level; and that further research would be required if any of the identified route options are pursued.

6.4.2 Positive Evidence For Potential Demand

Some of the evidence collected for the study can be taken as positive indications of potential demand for an Oban-Glasgow air service:

- The base of existing trips between Oban and Barra. This includes 126,000 passengers using Oban rail station and around 32,000 passengers flying in/out of Glasgow airport as part of trips to/from the Oban area.
- Extent of interest/potential use based on internet survey, including those looking to connect with flights over Glasgow.
- Relatively high proportion of trips currently made by public transport, indicating less value placed on accompanying one's own vehicle.
- "Journey time too long" was identified as the main constraint on current trip-making. This would be addressed by providing an air service.
- Potential demand not particularly dependent on a schedule providing a day trip opportunity, nor especially seasonal.
- Relatively limited dependence on generating new trips between Oban and Glasgow.

6.4.3 Less Positive Evidence For Potential Demand

Some of the evidence collected for the study can be taken as less positive indications of potential demand:

- Relatively short surface journey times. By car this is around 2 hours and 10 minutes, by public transport of the order of 3-3½ hours.
- High frequency public transport connections, with most services direct.

- Relatively low proportion of internet survey respondents identified constraints on making trips between Oban and Glasgow.
- Very limited willingness to pay above the base (£65) single fare-by both personal and business respondents.
- Interlining passengers will require quite specific service timings.
- CAA data suggest that interlining market will be imbalanced, containing a high proportion of outbound leisure traffic.

6.5 OPERATIONAL CONSIDERATIONS

6.5.1 Using a Scottish Government Twin Otter

For the reasons outlined at **Chapter 2**, the capacity to provide a Glasgow-Oban service with a Twin Otter is severely restricted by the aircraft's other PSO-related commitments. This option would only be conceivable if both Campbeltown and Tiree were undertaken by another aircraft, such as the Saab.

If this was the case then there would be issues around a lack of back-up should one Twin Otter be in engineering, and the other experience unplanned problems or delays. In such instances it can be expected that the Glasgow-Barra route would be given priority over an Oban-Glasgow route which has a better surface transport alternative.

Another issue is the additional cost and approvals to permit scheduled Twin Otter services authorised into Oban airport. This was discussed at **Chapter 4**, as part of the analysis of the Oban-Barra route

6.5.2 Using An Islander

Once again we have been drawn to consider the BN2 Islander for introducing an Oban-Glasgow service.

It appears that if use was made of the Islander that operates the Oban PSO services then an Oban-Glasgow service could be established using the PSO aircraft, crew and engineering support: that is, without occurring additional fixed costs.

A total all-in cost for an all year round service (on, say, 5 days per week) could be of the order of £250,000 for a year round service. However if the service was only run for a 16 week trial then this cost could be reduced to around £80,000.

Income from passengers should reduce this outlay further. Assuming a modest 33% load factor and an average yield of £50 per sector, gives an approximate income of £47,500.

This approach has the advantages that:

- The service could be trialled under de minimis rules given the level of deficit that would be incurred. This innovation would not have to await the next break in the Oban services PSO contract.
- No significant new commitments to equipment, staff or regulatory approvals are required.

An indicative timetable is shown at **Appendix E.** An additional permutation might be to combine the trial with the summer trial of Oban-Barra under the one de minimis-based exercise.

6.5.3 Longer-Term Operation

We believe that the route is unlikely to qualify for PSO designation. This is because of:

- The road journey between Oban and Glasgow being under three hours.
- From 2014, the existence of a higher frequency rail service, along with a high frequency bus service.
- The need to make the case that the air service would be vital to the economic and social development of the area.

We believe, therefore, that the means by which the route could be sustained would be through:

- It's operation on the back of a PSO service that largely covers the route's fixed costs
- Oban area residents being made eligible for ADS membership, with the reduction in outbound leisure fares generating additional demand and revenues for the service.

7 POTENTIAL ENHANCEMENT OF EXISTING SERVICE: BARRA-GLASGOW

7.1 EXISTING TRANSPORT PROVISION

Existing transport links between Barra and Glasgow are described elsewhere in the report. That is:

- Current Barra-Glasgow service, at **Chapter 2**.
- Oban-Barra ferry service, at **Chapter 4**.
- Surface travel between Oban and Glasgow, at **Chapter 6**.

7.2 SUMMARY OF ONLINE SURVEY FINDINGS

7.2.1 Introduction

This section presents the key findings of the part of the online survey covering potential enhancements to the existing Barra-Glasgow air service. The results are reported in full at **Appendix A**.

7.2.2 Personal Respondents

Existing Trip-Making

Some 70 of the 457 personal respondents to the overall online survey presently travel between Barra and Glasgow (including ultimate origins and destinations beyond). They make an average of around 6 return trips per year. Most (64%) of these trips are made in the April-October period.

The trips are usually quite long. Around three quarters involve three or more days at the destination. Only 6% of respondents stated that usually spend 1 day or less at their destination.

VFR, Short break/holiday and Business are the main trip purposes.

Around half the respondents usually use the Barra-Glasgow air service for these trips. A further 41% travel via Oban by using the ferry. Most of them accompany a vehicle.

Capacity Issues on Glasgow-Barra Air Service

On flights *from Barra* the greatest reported capacity issues are in June, July and August. There are fewer issues in April, May and September. Nevertheless, more than half reported that they are unable to get a seat on their desired flight at least half of the time.

Capacity issues are at their least during the winter months. However, even at that time of year only one in five stated that they can always get booked on the flight that they wanted to use.

Respondents look to travel off Barra most commonly on a Friday, followed by Monday and Saturday. These are also the days for which capacity problems were most commonly reported.

The picture is similar for flights *from Glasgow*. However, there are some significant differences in the results by direction of travel.

Compared to flights *from Glasgow*, those *from Barra* are much more:

- Difficult to get booked on in the April, May, September period.
- Likely to be preferred/needed for travel on peak summer Sundays.
- Likely to give respondents difficulties in booking a seat at peak summer weekends and on Sundays in the April, May, September period.

While those *from Glasgow* are much more:

- Likely to be preferred/needed for travel on Mondays throughout the year and on Saturday outside the peak summer months.

Where a seat is not available on the desired flight, the most common response is to travel to Glasgow by ferry and surface transport to/from Oban. However, in the winter respondents are most likely to use the air service on another day.

Around one in seven respondents said that they do not make a trip between the Glasgow area and Barra if they are unable to get booked on the air service.

Options for Increased Capacity

The survey results imply that the most popular demand for additional capacity is on the days in June, July and August when at least double rotations already operate.

The results also show a preference for additional flights in the winter rather in the summer months outside June-August. However, there is also some demand for more seat capacity on Thursdays in these three peak months.

Those who opted for more seat capacity during October-March most commonly referred to Friday, followed by Monday and then Thursday.

Respondents were then asked, if their preferred change(s) were introduced how many additional return trips they might make per year on the air service. 88% stated that they would make at least one additional return flight. The overall average-including those who stated "zero"- was around two additional flights per annum.

There would an overall increase in trip-making. Some 40% stated that their additional flights on the air service would be wholly new trips between Barra and the Glasgow area. Only 17% believed that all their additional flights would be existing trips currently made by using the Oban-Barra ferry service.

7.2.3 Business Respondents

Introduction

There are some similarities between the responses on behalf of businesses and those made on a personal basis. Therefore, the following analysis concentrates on key differences between the two groups.

Existing Trip-Making

Some 15 of the 70 business respondents to the overall online survey presently travel between Barra and Glasgow (including ultimate origins and destinations beyond). They make an average of around 7 return trips per year. There is no marked variation in trip-making across the year.

The trips are usually quite long. Over 92% involve three or more days at the destination. None are for less than two days.

However, only 8% use the Barra-Glasgow air service to make these trips. The most common means is travelling via Oban using the ferry and accompanying a vehicle. This was reported by 75% of respondents.

Options for Increased Capacity

The survey results imply that the most popular demand for additional capacity is on the days in June, July and August when at least double rotations already operate.

There is also a preference for additional flights in the winter rather in the summer months outside June-August. Those who opted for more seat capacity during October-March most commonly referred to Friday, followed by Monday.

Respondents were then asked, if their preferred change(s) were introduced how many additional return trips they might make per year on the air service. Some 79% stated that they would make at least one additional return flight.

There would be an overall increase in trip-making. Almost two thirds (64%) stated that their additional flights on the air service would be wholly new trips between Barra and the Glasgow area.

7.3 HEALTH-RELATED TRAFFIC

NHS Western Isles were unavailable to this study for consultation; nor was data provided on current NHS-related passenger movements to/from locations outside their area.

However based on our team's experience and knowledge it appears reasonable to assume that additional flights on the Barra-Glasgow would be helpful. They would add robustness to present arrangements. In particular, for patients who require an appointment at relatively short notice, but do not classify as requiring 'ambulance' transport from the Scottish Air Ambulance Service.

7.4 OPERATIONAL CONSIDERATIONS

7.4.1 Current Practice

The Twin Otter has long been operated by Loganair on the route. As a result of the special nature of the landing area, the timetable must vary with the changing tides, and Loganair have standardised this diversity into two general timetable options. There is an early morning departure option (at 0850) and a middle of the day departure option (1330) from Glasgow.

The two options vary on a fortnightly basis. The tidal window is usually such, except in exceptional tidal circumstances on an estimated five days each year, that allows the aircraft to achieve double rotations in sequence. It also permits a 20 minute turnround at Barra for the disembarkation and boarding of passengers and luggage.

When two Twin Otters are available the double rotation can be achieved by both flying into Barra, rather than one aircraft operating sequentially. On the few 'reduced tidal window' days the double rotations are achieved by flying the two Twin Otters in parallel to provide the services within the shortened window.

7.4.2 Options for Providing Additional Flights

There are two options for providing additional flights into Barra:

1

a) Offer those additional flights on days when there currently only is one service scheduled; and/or
b) Lengthen the period of the year when double rotations operate.

2

Where demand justifies it, offer three rotations on days when two Twin Otters are available. Then one can complete a double rotation, whilst the other fulfils the other PSO destination commitments and completes one rotation into Barra. This option however is dependent upon their being two guaranteed Twin Otters available.

We would expect that these options could provide the additional flights on a marginal cost basis-i.e. no additional fixed costs in terms of crew. This assumes that the option(s) do not lead to an extensive increase in the total number of flights operated.

The Saab 340 could be part of any significant route re-configuration in the west

8 POTENTIAL NEW ROUTE: GLASGOW-SKYE

8.1 INTRODUCTION

This Chapter considers a number of issues around introducing a scheduled air service between Glasgow and Skye using the new Twin Otter 400 aircraft. It covers:

- Specific air service cost considerations.
- Scheduling of the service.
- Basing an aircraft at the Skye airport.

8.2 AIR SERVICE COSTS

8.2.1 Introduction

The recent Skye Air Services Feasibility Study explored the potential for establishing a Glasgow-Skye service based on a commercial model for a standalone service using a range of aircraft, including a Twin Otter 300 series. This study has considered if there may be an opportunity to deliver a Glasgow-Skye service through the extra utilisation of aircraft currently deployed on the Scottish Governments existing PSO network which serves Barra, Campbeltown and Tiree. It also considered the impact of replacing the Twin Otter 300 series with a new Twin Otter 400.

As highlighted in **Chapter 2**, the research for this study suggested that this service sharing could have implications for the operation of a Glasgow-Skye service with the new Twin Otters. This section highlights some of these issues. For the detail underpinning the analysis, please refer **Appendix D** and **Appendix E**.

8.2.2 Twin Otter Leasing Costs

The Skye Air Services Feasibility Study assumed an annual lease rate for a Twin Otter aircraft assuming a current 'old' Twin Otter 300 aircraft. Transport Scotland once owning new Twin Otter 400 aircraft would in all likelihood assign an annual lease cost to the operators of its services. The level of that lease would be the subject of a judgement call, but could potentially be set at a higher lease rate than for a Twin Otter 300, as indicated in Appendix D.

Another aspect of twinning the two routes is that the Skye study assumed one aircraft, whilst Transport Scotland will acquire two Twin Otters. Indeed to deliver an optimal timetable to both Barra and Skye, and as examined below, at certain times of the month, two aircraft would be required to deliver both Barra and Skye in parallel.

8.2.3 Twin Otter Maintenance Costs

If the Barra Twin Otter air service is shared with a Skye Twin Otter air service this will inevitably burden the maintenance provision of aircraft operating into Skye with the additional maintenance regime surrounding Barra operations. A standalone Skye air service would be protected from this complication. As a likely Skye air service timetable is estimated at approximately 1,500 flight hours per annum (the Barra air service annual flight hours is significantly less than this) any additional hourly maintenance costs could become significant.

8.3 POSSIBLE SCHEDULING USING TWIN OTTERS

8.3.1 Glasgow-Skye With Glasgow-Barra

Table 8.1, describes what a Glasgow-Skye and Glasgow-Barra joint timetable might look like, with Monday-Friday operations shown.

There would be variations between summer and winter. However, a key point is that two aircraft would be required to deliver this timetable. This is because of timetable overlaps at the beginning of the day, under certain tidal conditions.

Also, the timetable assumes that night time operations are possible at Skye. In addition, it is assumed that the Campbeltown and Tiree services are covered by a Saab or similar aircraft.

TABLE 8.1: GLASGOW-SKYE WITH GLASGOW-BARRA: INDICATIVE TIMETABLE: MONDAY-FRIDAY

Glasgow-Skye		Glasgow-Barra		Glasgow-Skye-Glasgow	
Ex Gla	0730	Ex Gla	0850 or 1330	Ex Gla	1745
Arr Skye	0830	Arr Barra	1005 or 1445	Arr Skye	1845
Ex Skye	0850	Ex Barra	1025 or 1505	Ex Skye	1905
Arr Gla	0950	Arr Gla	1140 or 1620	Arr Gla	2005

For the reasons discussed in **Chapter 2**, for several months each year there would be only one Twin Otter aircraft available. This could be addressed by one of the following:

- Open Skye airport earlier to permit one aircraft to complete any reasonable timetable sequentially.
- Source a third Twin Otter aircraft for Skye alone, and consider the second Transport Scotland Twin Otter as providing reserve cover for all services, as in effect it currently does for the Barra PSO. Such a scenario might also obviate the need for Saab (or similar) substitution on Tiree and Campbeltown.
- Arrange with a BN2 Islander operator for this aircraft to provide cover some of the year (and also to act as an emergency back-up at other times). As shown at **Chapter 2**, this aircraft has less than half the number of seats on a Twin Otter.

8.3.3 Financial Implications

The cost of running a Skye air service using Transport Scotland's Twin Otters therefore could be designed and costed in several different ways from a standalone Skye Air Service Twin Otter solution.

Several factors should be borne in mind:-

- The level of any assigned lease costs for the new Twin Otter 400s between existing and any new commitments. (see 8.2.2)
- Additional hourly engineering costs connected with Barra's beach operations and how that might negatively impact a Skye air service cost structure. (see 8.2.3)

- The implications of, and costs connected with, any service disruption risks, and consideration of appropriate aircraft back-up arrangements (see 8.3.1)

One aspiration at the outset of this study was to explore if Skye could benefit from providing additional, and enjoying in effect discounted, usage on aircraft already justified by existing commitments. The exact split of the costs connected with such sharing, would therefore be subject to a dialogue between the various funding organisations. Some of the issues and permutations outlined above would no doubt form part of that dialogue.

8.3.2 Glasgow-Skye via Oban With Glasgow-Barra

Table 8.2 describes what a Glasgow-Skye via Oban and Glasgow-Barra joint timetable might look like, with Monday-Friday operations shown.

TABLE 8.2: GLASGOW-SKYE VIA OBAN WITH GLASGOW-BARRA: INDICATIVE TIMETABLE: MONDAY-FRIDAY

Glasgow-Skye Via Oban		Glasgow-Barra		Glasgow-Skye Via Oban	
Ex Gla	0730	Ex Gla	0850 or 1330	Ex Gla	1745
Arr Oba	0800	Arr Barra	1005 or 1445	Arr Oba	1815
Ex Oba	0820	Ex Barra	1025 or 1505	Ex Oba	1835
Arr Skye	0900	Arr Gla	1140 or 1620	Arr Skye	1855
Ex Skye	0920			Ex Skye	1915
Arr Oba	1000			Arr Oba	2005
Ex Oba	1020			Ex Oba	2025
Arr Gla	1050			Arr Gla	2055

There are a number of issues around the scheduling. In particular:

- First arrival in Glasgow is approaching 1100.
- Long day trips for business passengers travelling to Oban and Skye.
- A 90 minute flight time between Skye and Glasgow.
- It is assumed that nightime operations are possible at both Skye and Oban.

It would be possible to run the service something like Glasgow-Skye-Oban-Glasgow in the morning and Glasgow-Oban-Skye-Glasgow in the evening to address the issue of the late morning arrival in Glasgow.

However, this would mean passengers flying from Glasgow to Oban on the first flight having a very indirect routing and extended flight time.

Table 8.2 may seem to imply that this schedule could operate using a single aircraft for most of the year. However, both airports require a STOL aircraft.

Therefore, when only one Twin Otter is available (with the other in maintenance), and the aircraft has a technical problem, or the aircraft is delayed because of weather and there is slippage in the timetable, the services are at risk. In addition, it is assumed that the Campbeltown and Tiree services are covered by a Saab or similar aircraft.

8.4 POSSIBLE USE OF ISLANDER AIRCRAFT FOR GLASGOW-SKYE

The Skye Air Services Feasibility study considered that a BN2 Islander would be capable of providing a Glasgow-Skye service. However the study suggested that under certain scenarios significantly more subsidy would be required to operate with an Islander.

It might however be easier to persuade an operator to base an Islander rather than a Twin Otter aircraft in Skye (more on this below). This could help to ensure a 'Skye centric' timetable with an early arrival in Glasgow and a late arrival back in Skye. However, a hangar and some other infrastructure would have to be provided to permit the aircraft to overnight on the island.

There are also, however, some issues to consider about the suitability of the Islander to meet market expectations. Using this aircraft would mean a flight time of around 70 minutes in a small and unpressurised aircraft - longer in adverse weather conditions.

8.5 BASING AN AIRCRAFT AT THE SKYE AIRPORT

The operators we consulted raised significant concerns about the possibility, or practicality, of basing, or overnighting, an aircraft on Skye (or at Oban). This was on the grounds of:

- Crew resistance.
- Increased crew costs, including inefficiencies by the splitting of their crew pool, especially given the need for crew cover and covering crew sickness.
- Additional hangarage and the capital funding to establish this.
- Engineering support requirements, including the end of day washes that would be required.

The airlines were of the view that recruitment for 'remote' bases would be problematical, especially for experienced captains. Pilots, particularly experienced captains, who might ordinarily be keen to re-locate to a remote base may also have concerns about secure long term employment at the base. These would be around the risk that the route or schedule proves unsustainable in the medium to long term, leading to base closure. First officers, often younger and with less family responsibilities, should be less of a problem as they will be very keen to fly the Twin Otter, given its reputation as a "real aircraft".

One air operator stated that basing crews and engineering at Skye or Oban would be a much more expensive option and complicating factor for operational planning purposes. It appears that in the order of an additional £80,000 per year of HOTAC and away from base expenses could have to be factored in.

There are also issues with crew cover and covering crew sickness which would add to the costs of providing year round cover for fragmented basing system. The operators also anticipated possible resistance from existing flight crews. Similar issues regarding providing engineering support would exist.

9 GENERAL CONCLUSIONS

1. Look to BN2 Islander To Test New Route Options

This study began by looking in detail at the Twin Otter and its route development possibilities. However, the investigations pointed to the role that could be played by the BN2 Islander.

The Islander could be used to provide services between Oban and Barra, and between Oban and Glasgow. This would draw on available capacity of an aircraft that is less expensive to operate than a Twin Otter. Again, this could be conceived as a trial, or pioneer, phase.

It appears worth exploring using the BN2 Islander as a pioneer for testing new route options more cost effectively in advance of the next tender round of the Oban PSO services. Funding for the experiment could be provided via the European Union de minimis "state aid" regulation. Consideration should also been given for trialling new routes on a three day per week basis to reduce cost, reflecting the findings of the online survey.

2. Use of Saab 340B or Equivalent

In a future tender round Transport Scotland could test the cost of fulfilling the Tiree and Campbeltown PSOs with another aircraft type (e.g. Saab 340B), should there be other short take off and landing activities for the Twin Otter fleet to undertake. A Glasgow-Skye service is the most obvious candidate for such a deployment.

3. Budgetary Considerations

It must also be recognised that the routes under consideration are all judged to require public support. Innovations will not occur unless funds are identified and provided by interested parties.

4. Engagement With NHS

Health-related traffic is an important component of passenger demand on Highlands & Islands air services. Our recent reviews of Highlands & Islands PSO services have included consultation with the relevant Health Board(s). However, the Scottish Government's recent Short Life Working Group report on transport to healthcare highlights the need for improving the engagement between Community Planning Partners in this area.

5. Collective Marketing and Branding

The five PSO sponsoring authorities (Transport Scotland, CnES, Argyll and Bute Council, Orkney Islands Council and Shetland Islands Council) could examine creating generic and potentially collaborative marketing approaches for the routes. Collaboration could include working with local area Destination Marketing Organisation (DMO) marketing groups and HIAL.

There are three clusters of Britten Norman Islander operations, even though each is operated by a different supplier. The Twin Otter offers great publicity and developmental possibilities, especially as the Barra beach landing is now one of the iconic images of Scotland. There are many features that the routes hold in common, while niche markets could also be targeted.

6. Developing Oban Airport

Argyll and Bute Council / Oban Airport could work to attract the Inner Hebrides PSO operator to move another aircraft to Oban airport for charter use. This would supply an additional option for the business community to use to ease travel movements to other Scottish airports. The potential to attract engineering and other support jobs also exists, and the additional traffic would contribute to the airport's earnings.

7. Potential Seaplane Operations

Potential seaplane operations were not part of the study brief. However, the Twin Otter does have amphibian and seaplane conversion options. Specifically, this could potentially remove the need to upgrade Skye Airport, and permit the service to land/take off closer to the island's main centre population using infrastructure costing significantly less to provide.

Nineteen 100 Aviation looked more closely at this issue. It became apparent that neither the amphibian nor seaplane Twin Otter options are suitable for combining with the current Barra air service commitment. The detail underpinning this conclusion is contained in **Appendix D**. However, given recent EASA approvals relating to single engine turboprops for commercial passenger operations in France, other aircraft types could potentially be approved that might be able to offer seaplane services into Skye. We think this option may be worthy of further investigation.

10 RECOMMENDATIONS

Table 10.1 presents our recommendations. These are given in order of potential cost to the public sector.

TABLE 10.1: STUDY RECOMMENDATIONS

Ref	Recommendation	Potential Cost To Public Sector	Comments
A	Share study findings with Loganair	None	Loganair to review and consider whether evidence supports additional Glasgow-Barra flights
B	Oban-based charter BN2 Islander	To be agreed	Help facilitate more charter activity out of Oban by working with Inner Hebrides PSO operator to develop Oban as more of a BN2 Islander base. Provides business community with air charter option. One-off cost of providing additional hangarage at Oban Airport
C	Refuelling facility at Barra	Likely to require financial support	Providing fuel at Barra could allow two extra Twin Otter seats on flights from Glasgow to Barra. However, feasibility would depend on regulatory, environmental and practical issues
D1	Oban-Barra trial	<£50,000 per summer season trial	Explore Oban-Barra using de minimis funding, and the current BN2 Islander, on a 16 week summer trial (either 1 or 2 years). Need pre-agreement about how any subsequent operation would be funded. Could be stand alone or combined with a similar Oban-Glasgow trial (D2)
D2	Oban-Glasgow trial	<£50,000 per spring or autumn trial	Explore Oban-Barra using de minimis funding, and the current BN2 Islander, on a 16 week summer trial (either 1 or 2 years). Need pre-agreement about how any subsequent operation would be funded. ADS rather than PSO seems the likely long term funding route
E	Oban-Campbeltown	£300,000-£500,000	Do not consider further
F1	Glasgow-Skye with shared Twin Otter model	**Airport upgrade*** £2.3-£4.8 million **Airport running costs*** £550-£660k pa **PSO support** £189k pa* **Note** additional engineering costs were indicated if using new Twin Otter fleet and twinning with more expensive Barra maintenance regime	Transport Scotland would have to agree that other aircraft would undertake the Glasgow-Tiree and Glasgow-Campbeltown services, to free up Twin Otter capacity. Need to recognise that there will be service integrity challenges when both Skye and Barra are linked with a fleet of only two Twin Otters. Indeed advance consideration should be given to a back-up solution, or even developing the case for a third Twin Otter.
F2	Glasgow-Skye or Skye-Glasgow with BN2 Islander	**Airport upgrade*** £2.3-£4.8 million **Airport running costs*** £550-£660k pa **PSO support** £300k pa*	If aircraft was based at Skye to optimise the timetable then hangar would also be required. Passenger expectation considerations may over-rule this option.
F3	Seaplane service to Skye	Alternative approach with no costs estimated	The two new Twin Otters could not combine an amphibian option with the current Barra service, and Twin Otter might not be the optimal aircraft in any case. Consider the feasibility and acceptability of an alternative approach using other makes of seaplanes

*See Skye Air Service Feasibility report

Appendix A

Online Survey Results

A.1 INTRODUCTION

This Appendix sets out the results of the online survey. Details of the approach to the survey are given in the text of the main report. The analysis here describes, first, the profile of those who responded to the survey on a personal basis, and of businesses that also responded. It then gives the findings-separately for the two types of responses-for each of the four air routes covered in the survey.

There was a total of 457 responses to the survey. Of these, 387 were on a personal basis, with the balance of 70 were made on behalf of a business.

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

A.2 PROFILE OF PERSONAL RESPONDENTS

A.2.1 Place of Residence

Table 2.1 summarises the place of residence of personal respondents. This is based on those (over three quarters) who provided postcode information.

TABLE 2.1: PLACE OF RESIDENCE OF PERSONAL RESPONDENTS

Area	Share of Respondents
Argyll & Bute	59%
Outer Hebrides	23%
Glasgow and nearby local authorities*	5%
Rest of Scotland	7%
Rest of UK	4%
Overseas	<1%
Total	**100%**

* Note: West Dunbartonshire, South Lanarkshire, East Renfrewshire, Inverclyde

Over half (59%) are residents of Argyll and Bute. Most of the remainder (around one quarter of all respondents) are from the Outer Hebrides. Despite three of the four routes being to/from Glasgow Airport, relatively few (5%) of those completing the survey came from that area. Around 5% in total live outside Scotland (and are almost all from England).

Table 2.2, over, provides further information on the place of residence of the respondents from Argyll and Bute.

It shows that a large number of responses came from people living in what we have termed "Oban and surrounding area". They account for three quarters of all Argyll and Bute respondents, and more than 40% of all those who completed the survey on a personal basis.

The remaining Argyll and Bute respondents were quite evenly spread across the area. Despite Campbeltown being the airport for one of the four routes, a relatively small number of responses came from Kintyre residents (around 13 it appears). A number of returns came from those living in the Argyll islands-mainly Mull & Iona, Colonsay and Coll.

TABLE 2.2: DETAILED PLACES OF RESIDENCE OF ARGYLL & BUTE PERSONAL RESPONDENTS	
Sub-Area	**Share of All Survey Respondents**
Oban and surrounding area (PA34, PA37, PA38)	44%
North east Argyll and Bute (PA32, PA33, PA35, PA36)	2%
South of Oban area to beyond Lochgilphead (PA30, PA31)	3%
Kintyre (PA28, PA29)	3%
Cowal	2%
East Argyll & Bute (G82, G83, G84)	1%
Argyll Islands	4%
Argyll & Bute Total	**59%**

Table 2.3 provides more detail on the place of residence of Outer Hebrides respondents.

TABLE 2.3: DETAILED PLACES OF RESIDENCE OF OUTER HEBRIDES PERSONAL RESPONDENTS	
Island	**Share of All Survey Respondents**
Barra	14%
South Uist & Eriskay	2%
Benbecula	2%
North Uist	2%
Lewis and Harris	3%
Outer Hebrides Total	**23%**

As might be expected a majority of Outer Hebrides respondents live in Barra. They account for around one in seven (more than 50) of all respondents to the survey. However, responses were received from through the island chain including some from Lewis and Harris.

A.2.2 Employment Status

The vast majority (80%) of the sample are in work-either employed or self-employed and very largely on a full time basis. One in ten are retired, with a further 6% currently in education or training.

A.3 PROFILE OF BUSINESS RESPONDENTS

A.3.1 Business Location

Table 3.1, over, shows the location of the businesses that responded. This is based on those (over three quarters) who provided postcode information.

As with the personal respondents, over half (54%) of businesses are based in Argyll and Bute. In addition, a significant proportion (almost 40%) are from the Outer Hebrides. There were few responses from businesses based elsewhere.

TABLE 3.1: BUSINESS RESPONDENTS LOCATION	
Area	**Share of Respondents**
Argyll & Bute	54%
Outer Hebrides	39%
Glasgow and nearby local authorities*	2%
Rest of Scotland	5%
Total	**100%**

* Note: West Dunbartonshire, South Lanarkshire, East Renfrewshire, Inverclyde

Table 3.2 provides further information on the location of Argyll and Bute business respondents.

TABLE 3.2: DETAILED LOCATION OF ARGYLL & BUTE BUSINESS RESPONDENTS	
Sub-Area	**Share of All Survey Respondents**
Oban and surrounding area (PA34, PA37, PA38)	39%
North east Argyll and Bute (PA32, PA33, PA35, PA36)	3%
Kintyre (PA28, PA29)	8%
Argyll Islands	3%
Argyll & Bute Total	**54%**

As with the personal respondents, the Argyll and Bute businesses are very largely based in "Oban and surrounding area". Most of the rest are from Kintyre. Those in the islands are based in either Mull & Iona or Colonsay.

Table 3.3 provides further detail on the Outer Hebrides businesses' locations.

TABLE 3.3: DETAILED PLACES OF RESIDENCE OF OUTER HEBRIDES BUSINESS RESPONDENTS	
Island	**Share of All Survey Respondents**
Barra	17%
South Uist & Eriskay	5%
Benbecula	2%
Lewis and Harris	15%
Outer Hebrides Total	**39%**

As might be expected, most come from Barra, with the data suggesting around 12 business respondents from that island. There was also a similar number from Lewis and Harris, plus a small number from parts of the Uists.

A.3.2 Business Sector

Business responses are almost all (92%) from service industries. Overall, accommodation and food service activities (which could be taken as a proxy for tourism businesses) accounted for 29% of all businesses that took part in the survey.

The main other specific types of services were:

- Professional, scientific and technical activities: 14% of all business respondents.
- Information and communication 8%
- Arts, entertainment and recreation 6%

Apart from services, the main other type of respondent was from the primary sectors. Together, agriculture, forestry and fishing accounted for 5% of survey respondents. There were very few returns from those in either manufacturing or construction.

A.3.3 Size of Business

The size of respondents' business, in terms of employee size band, is shown at **Table 3.4**.

TABLE 3.4: SIZE OF RESPONDENT'S BUSINESS	
Number of Employees at Place of Work	**Share of All Survey Respondents**
1-5	41%
6-10	16%
11-20	13%
21-30	6%
More than 30	24%
Total	**100%**

Most businesses are relatively small scale. More than half (57%) have no more than ten employees and around 40% of the total have no more than five employees. This reflects the general business base of the locations of most of the businesses that responded. However, it is notable that around one quarter of businesses employ more than 30 people, which is a relatively large proportion in a Highlands & Islands context.

A.4 FINDINGS: OBAN-BARRA

A.4.1 Personal Responses

Current Trip Making Between The Oban Area and Barra

Respondents were asked if they travel between the Oban area and Barra and, if not, whether they would be interested in the possibility of an air service being developed between the two locations. Their answers are summarised at **Table 4.1**.

TABLE 4.1: CURRENT TRIP MAKING/INTEREST IN AN OBAN-BARRA AIR SERVICE		
Response	**Number of Respondents**	**Share of Respondents**
I presently travel between the Oban area and Barra	87	25%
I don't presently travel between the Oban area and Barra-but I am interested in an air service	151	43%
I don't presently travel between the Oban area and Barra-and I am not interested in an air service	114	32%
Total	**352**	**100%**

A total of 352 respondents answered this question. A minority (one quarter) presently make trips between the Oban area and Barra. A larger share (43%) do not presently travel between the two locations but are interested in the possibility of an air service being developed.

Thus, around two thirds (238 respondents) have a potential interest in an air service. The remaining one third do not currently travel between the two locations and are not interested in doing so even if an air route was established.

Some 76 respondents provided information on their current trip making between the two locations. The questionnaire stated that for inbound trips from the Outer Hebrides such a trip was defined as where they would be spending a number of hours to undertake activities in the Oban area, rather than simply travelling straight through Oban to/from another place (e.g. Glasgow).

In total they make 343 return trips per year, which represents a simple average of 4.5 trips per person. The actual range is between one and 24 return trips per year.

Table 4.2 shows the distribution of their trips throughout the year.

TABLE 4.2: SEASONALITY OF CURRENT TRIP-MAKING	
Season	**Share of Annual Trips**
Main summer (June, July, August)	38%
Other times of year (April, May, September, October)	34%
Winter (January, February, March, November, December)	28%
Total	**100%**

Trip making is most frequent in the main summer period. Some 38% of all annual trips take place in just three months. In contrast, frequency is lower in the winter when only 28% of trips are made over a period of five months.

Current travellers were then asked how long they usually spend their destination before making the return leg of the journey. As shown at **Table 4.3**, the large majority of trips last at least two days (accepting that this will reflect, to an extent, existing transport provision).

TABLE 4.3: LENGTH OF TIME AT DESTINATION	
Time	**Share of Respondents**
A working day or less	2%
Up to 24 hours	2%
1 day	7%
2 days	22%
3-7 days	44%
More than 7 days	21%
Total	**100%**

Approaching two thirds (65%) of trips involve at least three days at the destination, with around one in five being more than seven days.

As would be expected, the Castlebay-Oban ferry is almost exclusively the current means of travel between the two locations. This was referred to be 96% of current travellers. The remaining 4% travel between Lochboisdale and Oban.

Most travellers accompany a vehicle on the ferry journey. This is the case for 63% of respondents. The other 37% travel as foot passengers on the ferry.

Current travellers also provided information on the purposes of the trips they make between Barra and the Oban area. The main trip types they identified are set out at **Table 4.4**.

TABLE 4.4: PURPOSES OF TRIPS BETWEEN BARRA AND THE OBAN AREA: MOST POPULAR RESPONSES

Purpose	All That Apply	Most Common Trip Purpose
Short break/holiday	70%	26%
Visiting friends and relatives (VFR)	62%	46%
Shopping	34%	8%
Business travel	16%	9%

Some 70% make some trips that are for a short break/holiday and 62% do so for VFR purposes. One third make trips that involve shopping. However, in terms of frequency VFR is the most popular trip. 46% of current travellers identified this as the most common purpose of trips they make between Oban and the Barra area. In contrast, while trips are made for the other purposes shown, this is on a much less frequent basis than VFR.

Existing Constraints on Trip Making

Respondents were then asked if there is anything about the current ferry service that means that they cannot make some or as many trips as they would like between Barra and the Oban area. Almost three quarters (73%) identified at least one feature of the ferry service that constrains the number of trips that they make.

Again, they were asked to initially identify these factors and then identify the most common one that constrains their trip-making. The results are reported at **Table 4.5**.

TABLE 4.5: CONSTRAINTS ON TRIP-MAKING

Constraint	All That Apply	Most Common
Summer timetable-sailing lasts too long	35%	21%
Fare levels	26%	17%
Summer timetable-sailings are not on the right day/right time	33%	17%
Winter timetable-long gaps between the outward and return sailings	36%	15%
Winter timetable-sailings are not on the right day/right time	41%	14%
Winter timetable-sailing lasts too long	32%	8%
Can't always get booked on the sailings I would like to use	13%	8%

Note: Results for "All That Apply" are % of all respondents, including those whose trip making is not constrained

The middle column shows that most respondents identified issues around ferry scheduling in the winter timetable-although these are clearly also issues in the summer months. As well as timings, the length of crossing time is seen as a constraint, throughout the year. In general, available capacity is relatively unimportant in limiting trip-making.

The picture changes when respondents identify the most common constraint. First, the issues in the summer are more often identified than those in the winter (albeit there is not a great difference between the two seasons). This is likely to reflect a greater underlying demand for travel during the summer rather than the winter, irrespective of the actual services that are provided.

Second, fare levels appear to be a general ongoing constraint. In contrast, many of the other factors appear likely to affect the requirement of specific trips.

Overall, however, the responses are similar for most of the constraints. That is, there is no one or two factors that are much more important than the others in limiting trip-making.

Interest In Using an Oban-Barra Air Service

Respondents were then asked whether they would be interested in using an air service between Oban and Barra if one was established. This was qualified by stating that:

- Due to the tidal nature of the airstrip on Barra it would not be possible to make a day trip using the air service.
- Flights would depart either late morning or early afternoon depending on the tide.
- Flight time would be around 45 minutes.

Responses are given at **Table 4.6**.

TABLE 4.6: INTERESTED IN USING AN OBAN-BARRA SERVICE?

Response	Number of Respondents	Share of Respondents
Yes	163	79%
No	14	7%
Don't Know	30	14%
Total	**207**	**100%**

More than three quarters (163 of all respondents to the survey) stated they would be interested in using the service. Most of the rest (14% of all respondents to the question) were "Don't Know"s.

Some eleven of the "No" respondents provided additional information on why they would not be interested in using the service. The main ones were:

- Looking to travel direct to/from Glasgow rather via Oban (seven responses).
- Wish to accompany their own car while on a trip (three).

Those interested in using the service were then asked how many single trips per year they might make on the service at various fare levels. The results are shown at **Table 4.7**.

TABLE 4.7: POTENTIAL TRIP-MAKING ON THE AIR SERVICE		
One Way Fare	**Number of Respondents Who Would Use The Service**	**Number of Single Trips Per Annum**
£65	135	556
£85	50	190
£105	18	62
£125	13	41

Of the 163 individuals who had stated that they would be interested in using the service (as per **Table 4.6**), 135 would do so at a one way fare of £65. However, demand drops sharply in response to a fare of £85-particularly in terms of total demand. It does so again when the fare is increased to £105. There is much less effect in raising the fare to £125, although demand does fall again.

In each fare bracket, a significant proportion of users would make fewer than three return trips on the service per year. Thus, within the survey respondents there is not a significant core of high frequency users that would help to sustain demand. In part this reflects the limited number of annual trips currently made between the two locations at present (i.e. 4.5 return trips, as shown earlier).

The responses indicate a high elasticity of demand. Each increase in fare results in a significant fall in demand and with elasticities of at least -1.8 in each case, increasing fares would result in a decrease in operator revenues as well as in demand.

Respondents were also asked how their use of an Oban-Barra flight would vary throughout the year. The results are given at **Table 4.8**.

TABLE 4.8: SEASONAL VARIATION IN NUMBER OF TRIPS ON OBAN-BARRA AIR SERVICE	
Variation	**Share of Respondents**
I would make the same number of trips in the summer (April-September) as in the winter (October-March)	40%
Most of the trips would be in the summer (April-September)	27%
All of the trips would be in the summer (April-September)	21%
Most of the trips would be in the winter (October-March)	8%
All of the trips would be in the winter (October-March)	4%
Total	**100%**

The most common response was that trip-making would be the same all year round (40%). However, a total of 48% stated that they would make most or all of their trips in the summer. Despite the issues around the winter ferry service identified earlier only 12% would make most or all of their Oban-Barra air trips between October and March. Again, this appears to reflect a greater underlying demand for travel in the summer months.

Possible Impact on Overall Trip Making

The service would stimulate total trip making between Barra and the Oban area. Half of those who would be interested in using the service said that all flights would be new trips between the two locations. Only 21% of respondents stated that all their trips on the flight would otherwise be made on the ferry service.

There would also be limited displacive effects on the existing Glasgow-Barra air service. In particular, this is because more than half (58%) of those interested in using Oban-Barra flights do not use the Glasgow-Barra service. Only 21% of respondents expect some or all of their flights to/from Oban to be in place of ones they currently make on the Glasgow-Barra route.

Timetable Preferences

Flight frequency does not appear to have a significant impact on potential demand for an Oban-Barra air service. Around three quarters (74%) of respondents stated that they would still make the same number of flights on an Oban-Barra air service if it operated on only three days of the week. A further one in five (20%) would reduce the number of flights by up to one half.

Thus, only 5% would either make a lot less flights (i.e. fewer than one half) or not use the service at all if there was a three day per week operation.

Finally, respondents were asked to indicate which days would be the most useful for their travel if there was a three day per week service. Each of the seven days of the week was to be placed in order where 1="most useful" and 7="least useful".

The results are summarised at **Table 4.9**.

TABLE 4.9: DAY OF THE WEEK PREFERENCES UNDER A THREE DAY OPERATION		
Summer		
	First Preference=1 (Number of Respondents)	**Average Score**
Monday	43	2.4
Tuesday	20	3.5
Wednesday	18	3.6
Thursday	19	3.6
Friday	75	1.8
Saturday	32	2.8
Sunday	39	3.0
Winter		
	First Preference=1 (Number of Respondents)	**Average Score**
Monday	31	2.7
Tuesday	15	3.8
Wednesday	11	4.2
Thursday	12	4.0
Friday	46	2.0
Saturday	23	2.9
Sunday	23	3.4

Note: Overall results indicated by Orange=most useful, Blue=second most useful and Green=third most useful

They show, first, the number of respondents making a particular day their first choice (i.e. "most useful"). Second they give an average score for each day. The lower the average then the more useful it would be in general. This is takes into account the expression of second, third, etc, preferences rather than simply the first preference.

Table 4.9 shows that Friday is seen as the most useful day followed by Monday and then by Saturday. There is very little change in preferences between summer and winter.

Final Comments

Respondents were also able, on an open-ended basis, to provide any further comments about a possible air service between Barra and Oban. Some 74 respondents did so. They provided a wide range of comments which we grouped by theme. The most popular ones were:

- The significance of an air service in reducing travel time compared to the ferry service (15 respondents).
- Potential for the service to attract more visitors (11).
- Relevance to the Uists -either by benefiting travellers to/from Uist or that the respondent would like to see an Oban-Benbecula service-either direct or via Barra (7).
- Would not want to see a reduced Glasgow-Barra service as a result of introduction of Oban-Barra flights (5).

A.4.2 Business Responses

Current Trip Making Between The Oban Area and Barra

Business respondents were asked if they travel between the Oban area and Barra and, if not, whether they would be interested in the possibility of an air service being developed between the two locations. Their answers are summarised at **Table 4.10**.

TABLE 4.10: CURRENT TRIP MAKING/INTEREST IN AN OBAN-BARRA AIR SERVICE

Response	Number of Respondents	Share of Respondents
I presently travel between the Oban area and Barra	27%	18
I don't presently travel between the Oban area and Barra-but I am interested in an air service	38%	25
I don't presently travel between the Oban area and Barra-and I am not interested in an air service	35%	23
Total	**100%**	**66**

A total of 66 respondents answered this question. A minority (around one quarter) presently make trips between the Oban area and Barra. A larger share (38%) do not presently travel between the two locations but are interested in the possibility of an air service being developed.

Thus, around two thirds (43 respondents) have a potential interest in an air service. The remaining 35% do not currently travel between the two locations and are not interested in doing so even if an air route was established.

Some 15 respondents provided information on their current trip making between the two locations. The questionnaire stated that for inbound trips from the Outer Hebrides such a trip was defined as where they would be spending a number of hours to undertake activities in the Oban area, rather than simply travelling straight through Oban to/from another place (e.g. Glasgow).

In total the respondents make 85 return trips per year. This which represents a simple average of 5.7 trips per person. The actual range is between two and 12 return trips per year.

Table 4.11 shows the distribution of their trips throughout the year.

TABLE 4.11: SEASONALITY OF CURRENT TRIP-MAKING	
Season	**Share of Annual Trips**
Winter (January, February, March, November, December)	48%
Main summer (June, July, August)	29%
Other times of year (April, May, September, October)	23%
Total	**100%**

Trip making is most frequent in the five winter months. Some 48% of all annual trips take place then.

Current travellers were then asked how long they usually spend their destination before making the return leg of the journey. As shown at **Table 4.12**, for the vast majority this is at least two days, while 68% are between two and seven days.

TABLE 4.12: LENGTH OF TIME AT DESTINATION	
Time	**Share of Respondents**
A working day or less	0%
Up to 24 hours	19%
1 day	0%
2 days	31%
3-7 days	37%
More than 7 days	12%
Total	**100%**

As would be expected, the Castlebay-Oban ferry is the current route used to travel between the two locations. This was referred to by 81% of current travellers. A number of others travel by ferry between Lochboisdale and Oban. The vast majority (92%) accompany a vehicle on the ferry rather than travelling as foot passengers.

Current travellers also provided information on the purposes of the trips they make between Barra and the Oban area. The main trip types they identified are set out at **Table 4.13**, over.

Business travel accounts for a large proportion of the trips made between the two locations. Some 81% of respondents currently make such trips and for more than half of the sample business travel is their most common trip purpose.

TABLE 4.13: PURPOSES OF TRIPS BETWEEN BARRA AND THE OBAN AREA: MOST POPULAR RESPONSES		
Purpose	**All That Apply**	**Most Common Trip Purpose**
Business travel	81%	54%
Shopping	37%	15%
Visiting friends and relatives	37%	8%
Short/break holiday	31%	8%
Personal business	25%	0%
Health-related	19%	0%
Travel to regular place of work	12%	15%

Leisure-related trips are also made but their frequency is much less than that of business travel.

Existing Constraints on Trip Making

Respondents were then asked if there is anything about the current ferry service that means that they cannot make some or as many trips as they would like between Barra and the Oban area. The vast majority (82%) identified at least one feature of the ferry service that constrains the number of trips that they make. Again, they were asked to initially identify these factors and then identify the most common one that constrains their trip-making. The results are reported at **Table 4.14**.

TABLE 4.14: CONSTRAINTS ON TRIP-MAKING		
Constraint	**All That Apply**	**Most Common**
Summer timetable-sailing lasts too long	38%	27%
Winter timetable-long gaps between the outward and return sailings	47%	23%
Winter timetable-sailing lasts too long	41%	19%
Winter timetable-sailings are not on the right day/right time	38%	15%
Can't always get booked on the sailings I would like to use	35%	8%
Summer timetable-sailings are not on the right day/right time	26%	4%
Fare levels	18%	4%

Note: Results for "All That Apply" are % of all respondents, including those whose trip making is not constrained

The results point to the ferry services timetable as the sources of the main constraints. At times, fare levels and lack of capacity reduce the number of trips that are made but not at all on a frequency basis. The main general constraint is the ferry crossing time, although gaps between the sailings are a particular issue in winter.

Interest In Using an Oban-Barra Air Service

Respondents were then asked whether they would be interested in using an air service between Oban and Barra if one was established. This was qualified by stating that:

- Due to the tidal nature of the airstrip on Barra it would not be possible to make a day trip using the air service.

- Flights would depart either late morning or early afternoon depending on the tide.
- Flight time would be around 45 minutes.

Responses are given at **Table 4.15**.

TABLE 4.15: INTERESTED IN USING AN OBAN-BARRA SERVICE?		
Response	**Number of Respondents**	**Share of Respondents**
Yes	32	78%
No	3	7%
Don't Know	6	15%
Total	41	100%

More than three quarters (32 of all business respondents to the survey) stated they would be interested in using the service. Most of the rest (15% of all respondents to the question) were "Don't Know"s.

Those interested in using the service were then asked how many single trips per year they might make on the service at various fare levels. The results are shown at **Table 4.16**.

TABLE 4.16: POTENTIAL TRIP-MAKING ON THE AIR SERVICE		
One Way Fare	**Number of Respondents Who Would Use The Service**	**Number of Single Trips Per Annum**
£65	26	126
£85	17	72
£105	8	34
£125	6	23

Of the 32 individuals who had stated that they would be interested in using the service (as per **Table 4.6**), 26 would do so at a one way fare of £65. Demand drops quite sharply in response to a fare of £85. It does so again when the fare is increased to £105. There is much less effect in raising the fare to £125, although demand does fall again.

The responses indicate elasticity of demand, although less so than for the *personal* respondents to the Oban-Barra section of the questionnaire. Each increase in fare results in a significant fall in demand and would result in a decrease in operator revenues as well as in demand.

In each fare bracket, a significant proportion of users would make fewer than three return trips on the service per year. Thus, within the survey respondents there is not a significant core of high frequency users that would help to sustain demand.

Respondents were also asked how their use of an Oban-Barra flight would vary throughout the year. The results are given at **Table 4.17**, over.

The most common response was that trip-making would be the same all year round (44%). However, a total of 34% stated that they would make most or all of their trips in the summer.

TABLE 4.17: SEASONAL VARIATION IN NUMBER OF TRIPS ON OBAN-BARRA AIR SERVICE	
Variation	**Share of Respondents**
I would make the same number of trips in the summer (April-September) as in the winter	44%
Most of the trips would be in the summer (April-September)	30%
Most of the trips would be in the winter (October-March)	22%
All of the trips would be in the summer (April-September)	4%
All of the trips would be in the winter (October-March)	0%
Total	**100%**

Finally, some 22% would make most of their Oban-Barra air trips between October and March.

Possible Impact on Overall Trip Making

The service would stimulate total trip making between Barra and the Oban area. Half of those who would be interested in using the service said that all flights would be new trips between the two locations. Only 13% of respondents stated that all their trips on the flight would otherwise be made on the ferry service.

There would also be limited displacive effects on the existing Glasgow-Barra air service. In particular, this is because more than half (59%) of those interested in using Oban-Barra flights do not use the Glasgow-Barra service. Only 24% of respondents expect some or all of their flights to/from Oban to be in place of ones they currently make on the Glasgow-Barra route.

Timetable Preferences

Flight frequency would have some impact on potential demand for an Oban-Barra air service. Slightly over half (56%) of respondents stated that they would still make the same number of flights on an Oban-Barra air service if it operated on only three days of the week. Almost all of the others (41% of all respondents) would reduce the number of flights by up to one half.

Thus, only 4% would either make a lot less flights (i.e. fewer than one half) or not use the service at all if there was a three day per week operation.

Respondents were asked to indicate which days would be the most useful for their travel if there was a three day per week service. Each of the seven days of the week was to be placed in order where 1="most useful" and 7="least useful".

The results are summarised at **Table 4.18,** over.

They show, first, the number of respondents making a particular day their first choice (i.e. "most useful"). Second they give an average score for each day. The lower the average then the more useful it would be in general. This is takes into account the expression of second, third, etc, preferences rather than simply the first preference.

Table 4.18 shows that Monday is seen as the most useful day in both summer and winter. Friday also receives a high number of first preferences but its average scores that others give it a lower value.

TABLE 4.18: DAY OF THE WEEK PREFERENCES UNDER A THREE DAY OPERATION		
Summer		
	First Preference=1 (Number of Respondents)	**Average Score**
Monday	10	2.8
Tuesday	5	3.2
Wednesday	5	2.8
Thursday	2	3.3
Friday	8	3.4
Saturday	3	4.6
Sunday	3	4.9
Winter		
	First Preference=1 (Number of Respondents)	**Average Score**
Monday	11	2.9
Tuesday	6	3.0
Wednesday	6	3.1
Thursday	2	3.4
Friday	6	3.6
Saturday	2	4.5
Sunday	3	4.8

Note: Overall results indicated by Orange=most useful, Blue=second most useful and Green=third most useful

Overall, there is a greater preference for flights in the first three days of the week- although the preferences are less clear cut than those of personal respondents to the survey.

Final Comments

Respondents were also able, on an open-ended basis, to provide any further comments about a possible air service between Barra and Oban. Some 18 respondents did so. They provided a wide range of comments which we grouped by theme. The most popular ones were:

- Business benefits through opening up new markets and/or better serving existing ones (4 respondents).
- Barra-Glasgow air service is more of a priority than Oban-Barra (2).
- Fares are an important consideration (2).
- Would increase visitor activity (2).

A.5 FINDINGS: GLASGOW-BARRA

A.5.1 Personal Responses

Current Trip Making Between Barra and the Glasgow Area

Respondents were asked if they presently travel between Barra and the Glasgow area or if not, if they would be interested in using flights between Barra and Glasgow. This was to include trips where the start or end point is beyond Glasgow-e.g. Edinburgh, England, including connecting with an onward flights).

The responses are shown at **Table 5.1**.

TABLE 5.1: CURRENT TRIP MAKING/INTEREST IN BARRA-GLASGOW FLIGHTS

Response	Number of Respondents	Share of Respondents
I travel between Barra and the Glasgow area	70	24%
I don't presently travel between Barra and the Glasgow area-but am interested in flights between Barra and Glasgow	48	16%
I don't presently travel between Barra and the Glasgow area-and am not interested flights between Barra and Glasgow	177	60%
Total	295	100%

A total of 295 respondents answered this question. A minority (around one quarter) presently make trips between Barra and the Glasgow area. A smaller share (around one in six) do not presently travel between the two locations but are interested in the flights. Thus, 40% of those responding to the question have an interest in the air service.

Some 60 respondents provided information on their current trip making between the two locations. In total they make 353 return trips per year, which represents a simple average of 5.9 trips per person. The actual range is between one and 30 return trips per year.

Table 5.2 shows the distribution of their trips throughout the year.

TABLE 5.2: SEASONALITY OF CURRENT TRIP-MAKING

Season	Share of Annual Trips
Winter (January, February, March, November, December)	36%
Main summer (June, July, August)	34%
Other times of year (April, May, September, October)	30%
Total	**100%**

The number of trips is broadly similar across the three periods. However, there is greater intensity in the *main summer* as this period covers just three months of the year.

Current travellers were then asked how long they usually spend their destination before making the return leg of the journey. The results are shown at **Table 5.3**, over.

TABLE 5.3: LENGTH OF TIME AT DESTINATION	
Time	**Share of Respondents**
A working day or less	3%
Up to 24 hours	0%
1 day	3%
2 days	17%
3-7 days	43%
More than 7 days	33%
Total	**100%**

There is a clear bias towards relatively long trips. Over three quarters of the respondents spend at least three days at their destination. One in three spend more than seven days away. Very few spend just one day at the destination.

Those surveyed vary in terms of their usual means of travel between Barra and the Glasgow area. Almost half (49%) use the Barra-Glasgow flight. A further 41% travel via Oban. Most of them accompany a car on the ferry, with the rest (11% of all respondents) connect with public transport at Oban to travel to/from Glasgow.

Current travellers also provided information on the purposes of the trips they make between Barra and the Glasgow area. The main trip types are set out at **Table 5.4**.

TABLE 5.4: PURPOSES OF TRIPS BETWEEN BARRA AND THE GLASGOW AREA: MOST POPULAR RESPONSES		
Purpose	**All That Apply**	**Most Common Trip Purpose**
Short break/holiday	69%	33%
Visiting friends and relatives	66%	31%
Business travel	39%	12%
Shopping	39%	2%
Health-related	27%	6%

Some 69% make some trips that are for a short break/holiday and a similar amount (66%) do so for VFR purposes. Around 40% make some trips for each of shopping and business travel. Health-related trips were mentioned by fewer (27%) respondents.

There is also a similar picture for the *most common* trip purpose. Short break/holiday and VFR are the most common purpose of around one in three travellers.

Capacity Issues: Flights From Barra to Glasgow

Survey respondents were asked how they find the availability of seats for flying from Barra to Glasgow at various times of the year. Their responses are shown at **Table 5.5,** over.

The greatest reported capacity issues are in June, July and August. Around half of the respondents stated that most times they cannot get booked on the flight they want to use. A further 22% reported that this was the case around half the time.

TABLE 5.5: AVAILABILITY OF SEATS ON FLIGHTS FROM BARRA TO GLASGOW			
Response	June, July, August	April, May, September	**October-March**
I can always get booked on the Flight I want to use	11%	14%	21%
In most cases I can get booked on the Flight I want to use	19%	29%	61%
Around half the time I can get booked on the flight I want to use	22%	43%	11%
In most cases I cannot get booked on the flight I want to use	48%	14%	7%
Total	**100%**	**100%**	**100%**

There are fewer issues in April, May and September. Nevertheless, more than half (57%) reported that they were unable to get a seat on their desired flight at least half of the time.

Capacity issues are at their least during the winter months. However, even for that time of year only one in five stated that they can always get booked on the flight that they wanted to use.

Respondents were then asked to identify days of the week when they prefer, or need to, fly from Barra to Glasgow. Their responses are set out at **Table 5.6**.

TABLE 5.6: PREFERRED OR NECESSARY DAYS OF THE WEEK FOR FLYING FROM BARRA TO GLASGOW			
Day	**June, July, August**	**April, May, September**	**October-March**
Monday	24%	33%	33%
Tuesday	29%	29%	29%
Wednesday	19%	19%	24%
Thursday	29%	29%	33%
Friday	52%	52%	43%
Saturday	33%	33%	33%
Sunday	38%	29%	24%

Note: Results are % of respondents-multiple responses permitted. Overall results indicated by Orange=most popular, Blue=second most popular

It shows that Friday is clearly the most popular day throughout the year. The second most popular day varies across the 12 months, with Monday and Saturday most common. Wednesday is the least mentioned day.

Respondents then identified which, if any, particular days of the week they find it most difficult to get booked on a flight from Barra to Glasgow. **Table 5.7**, over, gives the results.

Friday is consistently the day on which there is most difficulty in getting booked to fly from Barra to Glasgow. However, similar levels of difficulty were also reported for Mondays and Saturdays.

TABLE 5.7: DAYS OF THE WEEK WHEN MOST DIFFICULT TO GET BOOKED ON FLIGHTS FROM BARRA TO GLASGOW			
Day	**June, July, August**	**April, May, September**	**October-March**
Monday	58%	53%	42%
Tuesday	16%	11%	0%
Wednesday	5%	5%	0%
Thursday	32%	32%	26%
Friday	58%	58%	47%
Saturday	53%	53%	47%
Sunday	37%	32%	26%

Note: Results are % of respondents-multiple responses permitted. Overall results indicated by Orange=most popular, Blue=second most popular

Capacity Issues: Flights From Glasgow to Barra

The same questions were asked about capacity issues on flights from *Glasgow to Barra*.

Table 5.8 shows that the greatest reported capacity issues are in June, July and August.

TABLE 5.8: AVAILABILITY OF SEATS ON FLIGHTS FROM GLASGOW TO BARRA			
Response	**June, July, August**	**April, May, September**	**October-March**
I can always get booked on the Flight I want to use	17%	17%	21%
In most cases I can get booked on the Flight I want to use	12%	33%	54%
Around half the time I can get booked on the flight I want to use	25%	29%	17%
In most cases I cannot get booked on the flight I want to use	46%	21%	8%
Total	**100%**	**100%**	**100%**

Approaching half (46%) of the respondents stated that most times they cannot get booked on the flight out of Glasgow that they want to use. A further 25% reported that this was the case around half the time.

There are fewer issues in April, May and September. Nevertheless, half of the respondents reported that they were unable to get a seat on their desired flight at least half of the time.

Capacity issues are at their least during the winter months. However, even for that time of year one in four stated that they cannot get booked on the flight that they want to use at least half of the time.

Table 5.9, over, shows that the main preferred/required day of travel from Glasgow to Barra is Friday followed by Monday and then Saturday. The next most important one is Thursday. This pattern is quite consistent throughout the year.

TABLE 5.9: PREFERRED OR NECESSARY DAYS OF THE WEEK FOR FLYING FROM GLASGOW TO BARRA			
Day	**June, July, August**	**April, May, September**	**October-March**
Monday	48%	50%	48%
Tuesday	19%	20%	19%
Wednesday	24%	25%	24%
Thursday	29%	30%	29%
Friday	52%	50%	48%
Saturday	43%	50%	48%
Sunday	19%	20%	14%

Note: Results are % of respondents-multiple responses permitted. Overall results indicated by Orange=most popular, Blue=second most popular

Table 5.10 shows the days of the week when respondents find it most difficult to get book on flights.

TABLE 5.10: DAYS OF THE WEEK WHEN MOST DIFFICULT TO GET BOOKED ON FLIGHTS FROM GLASGOW TO BARRA			
Day	**June, July, August**	**April, May, September**	**October-March**
Monday	61%	44%	38%
Tuesday	11%	6%	0%
Wednesday	6%	6%	0%
Thursday	22%	22%	19%
Friday	61%	56%	56%
Saturday	33%	50%	37%
Sunday	22%	17%	19%

Note: Results are % of respondents-multiple responses permitted. Overall results indicated by Orange=most popular, Blue=second most popular

The results very largely mirror the days on which respondents state that they prefer/need to fly from Glasgow to Barra.

There are some significant differences in the results by direction of travel. Compared to flights *out of Glasgow*, those *out of Barra* are much more:

- Difficult to get booked on in the April, May, September period.
- Likely to be preferred/needed for travel on peak summer Sundays.
- Likely to give respondents difficulties in booking a seat at peak summer weekends and on Sundays in the April, May, September period.

While those *out of Glasgow* are much more:

- Likely to be preferred/needed for travel on Mondays throughout the year and on Saturday outside the peak summer months.

Impact of Non-Availability

Respondents were asked what they usually do when unable to book a flight on the air service. The results are shown at **Table 5.11**, over.

TABLE 5.11: RESPONSE WHEN UNABLE TO BOOK A FLIGHT			
Response	**June, July, August**	**April, May, September**	**October-March**
Make the journey by ferry, plus car or public transport	50%	36%	25%
Use the air service on another day	21%	29%	32%
Fly using the Glasgow-Benbecula service	14%	14%	18%
I do not make a trip between the Glasgow area and Barra	14%	14%	14%
Total	**100%**	**100%**	**100%**

At most times of the year, the most common response is to travel to Glasgow by ferry and car/public transport to/from Oban. However, in the winter respondents are most likely to use the air service on another day.

A smaller number usually fly on the Glasgow-Benbecula route (although some respondents stated that this was now more difficult to do since the cessation of the Barra-Benbecula flights).

Finally, one in seven respondents do not make a trip between the Glasgow area and Barra if they are unable to get booked on the air service.

Specific Options for Increased Capacity

Respondents were presented with a range of options for providing greater seat capacity on the Glasgow-Barra service, through more frequent flights. This was within the existing constraints imposed by the tidal airstrip in terms of service timings and the inability to make a day trip using the air service.

They were asked to rank their top three preferences in order. This allowed analysis of first preferences and also a score which accounted for second and third preferences. 1st preference was given 3 points, 2nd preference=2 points, and 3rd preference=1 point. Thus, the higher the score the more popular the option.

The results are given at **Table 5.12**.

TABLE 5.12: PREFERENCES FOR SPECIFIC OPTIONS		
Option	**First Choice (% of respondents)**	**Score**
None of those specified	31%	82
More seat capacity on any particular day of the week between October-March	27%	81
More seat capacity on Thursdays-during June, July and August	20%	77
More seat capacity on Mondays-during May	15%	48
More seat capacity on Fridays-during May	14%	62
More seat capacity on Wednesdays-during June, July and August	13%	59
More seat capacity on Thursdays-during May	12%	38
More seat capacity on Sundays-during May	9%	43

Note: Some respondents indicated multiple first preferences

The most popular response is "None of those specified". This implies demand for additional capacity on days in the June, July and August when at least double rotations already operate.

The results also show a preference for additional flights in the winter months rather than additional capacity at other times of year. However, there is demand for more seat capacity on Thursdays-during June, July and August-much more so than for Wednesdays at that time of year. In general, there is only limited demand for additional flights in May.

Those who opted for more seat capacity between October-March were asked which would be their preferred day. Friday was the most popular choice-cited by 32% of respondents. This was followed by Monday (21%) and then Thursday (14%). Reflecting earlier findings there was very little demand for either Tuesday or Wednesday.

Impact of Preferred Changes on Trip Making

Respondents were then asked, if their preferred change(s) were introduced how many more return trips they would make per year on the Glasgow-Barra air service compared to the current level.

88% stated that they would make at least one additional return flight per year. The range was between one and 20. However, most were at the lower end. Around three quarters (73%) of all respondents to the question would make between 1 and 4 additional flights. The overall average (median)-including those who stated "zero" was around 2 flights.

There would be an overall increase in trip-making. Some 40% stated that the additional flights on the air service would be wholly new trips between Barra and the Glasgow area.

In addition, a further 43% stated that at least some of the additional flights would be wholly trips. The balance (17%) believed that all their additional flights would be existing trips currently made which use the Oban-Barra ferry service.

Just over half (54%) of the respondents would be looking to connect with other flights at Glasgow as part of these additional flights. These would mostly be for either:

- Up to one third of additional flights: 26% of all respondents; or
- Around one half of additional flights: 15%.

Final Comments

Respondents were also able, on an open-ended basis, to provide any further comments about a possible air service between Barra and Oban. Some 37 respondents did so. They provided a wide range of comments which we grouped by theme. The most popular ones were:

- Capacity as an issue-with references being almost all to the summer months (8 respondents).

- Demand for higher frequency of flight rather than simply additional seat capacity-e.g. seven day service all year round (6).
- Withdrawal of Barra-Benbecula service had made it more difficult to use Glasgow-Barra flight when Glasgow-Benbecula plane is fully booked and vice versa (5).
- Fares should be reduced (3).

A.5.2 Business Responses

Current Trip Making Between Barra and the Glasgow Area

Business respondents were asked if they presently travel between Barra and the Glasgow area or if not, if they would be interested in using flights between Barra and Glasgow. This was to include trips where the start or end point is beyond Glasgow-e.g. Edinburgh, England, including connecting with an onward flights).

The responses are shown at **Table 5.13**.

TABLE 5.13: CURRENT TRIP MAKING/INTEREST IN BARRA-GLASGOW FLIGHTS

Response	Number of Respondents	Share of Respondents
I travel between Barra and the Glasgow area	15	25%
I don't presently travel between Barra and the Glasgow area-but am interested in flights between Barra and Glasgow	11	18%
I don't presently travel between Barra and the Glasgow area-and am not interested flights between Barra and Glasgow	35	57%
Total	**61**	**100%**

A total of 61 respondents answered this question. One in four currently travel by Barra and the Glasgow areas, while a further 18% do not do so but are interested in flights between the two locations. Thus, 43% of those responding to the question have an interest in the air service.

Some 13 respondents provided information on their current trip making between the two locations. In total they make 95 return trips per year, which represents a simple average of 7.3 trips per person. The actual range is between two and 20 return trips per year.

Table 5.14 shows the distribution of their trips throughout the year.

TABLE 5.14: SEASONALITY OF CURRENT TRIP-MAKING

Season	Share of Annual Trips
Winter (January, February, March, November, December)	42%
Main summer (June, July, August)	22%
Other times of year (April, May, September, October)	36%
Total	**100%**

Most (over 40%) take place in the five winter months. Frequency is quite a bit less in the main summer months, when around one in five of the annual trips are made.

Current travellers were then asked how long they usually spend their destination before making the return leg of the journey. As shown at **Table 5.15**, the length of time is relatively long.

TABLE 5.15: LENGTH OF TIME AT DESTINATION	
Time	**Share of Respondents**
A working day or less	0%
Up to 24 hours	0%
1 day	0%
2 days	8%
3-7 days	75%
More than 7 days	17%
Total	**100%**

Three quarters of the sample usually spend between three and seven days at their destination. In total almost all (92%) of trips involve at least three days.

Current travellers also provided information on the purposes of the trips they make between Barra and the Glasgow area. The main trip types are set out at **Table 5.16.**

TABLE 5.16: PURPOSES OF TRIPS BETWEEN BARRA AND THE GLASGOW AREA: MOST POPULAR RESPONSES		
Purpose	**All That Apply**	**Most Common Trip Purpose**
Business travel	75%	45%
Visiting friends and relatives	58%	27%
Short break/holiday	50%	9%
Shopping	42%	0%
Personal Business	42%	0%

At least some business trips are made by 75% of the sample. Non-business trips-notably VFR-are also made by a considerable proportion of the respondents. Business along with VFR are the most common trip purposes. While other types of trip (e.g. shopping) are made they are so much less frequently than for business or VFR purposes.

However, there is quite limited use of the air service. Only 8% of business respondents usually use the flight to make a trip between Barra and the Glasgow area. The main means is very much the Oban-Castlebay ferry service and travel by car on the mainland. This is the usual way for 75% of respondents. Just 8% use that ferry service in conjunction with public transport to/from Oban. The final 8% travel to/from the mainland via the Oban-Lochboisdale ferry service.

Capacity Issues

There was a very small number of business responses to the questions on current capacity issues. The results are, therefore, not reported as their representativeness will be very limited.

Specific Options for Increased Capacity

Respondents were presented with a range of options for providing greater seat capacity on the Glasgow-Barra service, through more frequent flights. This was within the existing constraints imposed by the tidal airstrip in terms of service timings and the inability to make a day trip using the air service.

They were asked to rank their top three preferences in order. This allowed analysis of first preferences and also a score which accounted for second and third preferences. 1st preference was given 3 points, 2nd preference=2 points, and 3rd preference=1 point. Thus, the higher the score the more popular the option.

The results are given at **Table 5.17**.

TABLE 5.17: PREFERENCES FOR SPECIFIC OPTIONS

Option	First Choice (% of respondents)	Score
None of those specified	33%	1.00
More seat capacity on any particular day of the week between October-March	27%	1.50
More seat capacity on Thursdays-during June, July and August	13%	1.00
More seat capacity on Mondays-during May	13%	1.67
More seat capacity on Fridays-during May	13%	2.17
More seat capacity on Wednesdays-during June, July and August	7%	2.00
More seat capacity on Thursdays-during May	7%	2.00
More seat capacity on Sundays-during May	7%	2.00

Note: Some respondents indicated multiple first preferences

The most popular response was "None of those specified". This implies demand for additional capacity on days in the June, July and August when at least double rotations already operate. The results also show a preference for additional flights in the winter months rather than additional capacity at other times of year.

Those who opted for more seat capacity between October-March were asked which would be their preferred day. Friday was very clearly the most popular choice-cited by more than half (57%) of respondents. Most of the rest (29% of all respondents) would prefer the additional capacity to be provided on Mondays.

Impact of Preferred Changes on Trip Making

Respondents were then asked, if their preferred change(s) were introduced how many more return trips they would make per year on the Glasgow-Barra air service compared to the current level.

Some 79% stated that they would make at least one additional return flight per year. The range was between one and 20 additional flights. Most were at the lower end. 42% of all respondents to the question would make between 1 and 4 additional flights. However, a further 35% would make six or more such flights.

There would be an overall increase in trip-making. Around two thirds (64%) stated that their additional flights on the air service would be wholly new trips between Barra and the Glasgow area. In addition, a further 27% said that *some* of their additional flight would be new trips rather than existing trips diverted from the ferry service.

Just over half (54%) of the respondents would be looking to connect with other flights at Glasgow as part of these additional flights. These would mostly be for either:

- All additional flights: 23% of all respondents; or
- Around one half of additional flights: 15%.

A.6 FINDINGS: OBAN-CAMPBELTOWN

A.6.1 Personal Responses

Current Trip Making Between The Oban Area and the Campbeltown Area

Respondents were asked if they travel between the Oban area and the Campbeltown area and, if not, whether they would be interested in the possibility of an air service being developed between the two locations. Their answers are given at **Table 6.1**.

TABLE 6.1: CURRENT TRIP MAKING/INTEREST IN AN OBAN-CAMPBELTOWN AIR SERVICE

Response	Number of Respondents	Share of Respondents
I travel between the Oban area and the Campbeltown area	42	15%
I do not travel between the Oban area and the Campbeltown area-but am interested in using flights between Oban and Campbeltown	26	9%
I don't presently travel between the Oban area and the Campbeltown area-and am not interested in flights between Oban and Campbeltown	207	75%
Total	**275**	**100%**

A total of 275 respondents answered this question. A minority (less than one in six) presently make trips between the two areas. A further 9% do not presently travel between the two locations but are interested in using flights if they were operated.

Thus, around one quarter (68 respondents) have a potential interest in an air service. The remainder do not currently travel between the two locations and are not interested in doing so even if an air route was established.

Some 42 respondents provided information on their current trip making between the two locations. In total they make 476 return trips per year, which represents a simple average of 11.3 trips per person. The actual range is between one and 60 return trips per year.

Table 6.2 shows the distribution of their trips throughout the year.

TABLE 6.2: SEASONALITY OF CURRENT TRIP-MAKING

Season	Share of Annual Trips
Main summer (June, July, August)	35%
Other times of year (April, May, September, October)	35%
Winter (January, February, March, November, December)	30%
Total	**100%**

Trip making is quite evenly spread across the three periods. There are slightly more in the main summer months, and the other months between April and September, than in the winter.

Current travellers were then asked how long they usually spend their destination before making the return leg of the journey.

As shown at **Table 6.3,** most trips are of a short duration. None last longer than two days, while more than half (60%) of respondents usually spend no more than a working day at their destination.

TABLE 6.3: LENGTH OF TIME AT DESTINATION	
Time	**Share of Respondents**
A working day or less	60%
Up to 24 hours	0%
1 day	26%
2 days	14%
3-7 days	0%
More than 7 days	0%
Total	**100%**

Travel is almost all by private or company vehicles. These are used by 95% of respondents. The other 5% travel on public transport.

Current travellers also provided information on the purposes of the trips they make between the Oban and Campbeltown areas. The main trip types they identified are set out at **Table 6.4**.

TABLE 6.4: PURPOSES OF TRIPS BETWEEN THE OBAN AND CAMPBELTOWN AREAS: MOST POPULAR RESPONSES		
Purpose	**All That Apply**	**Most Common Trip Purpose**
Business travel	68%	75%
Visiting friends and relatives (VFR)	30%	7%
Short break/holiday	28%	0%
Shopping	20%	11%

Responses were made on a personal basis rather than on behalf of a business. Despite this trip-making by our sample is dominated by business travel. It was cited by more than two thirds of respondents. Other, leisure-related trips are also made. However, these are made much less frequently than business travel. The latter is the most common trip type for three quarters of the respondents.

Existing Constraints on Trip Making

Respondents were then asked if there is anything about the current journey between the Oban and Campbeltown areas that means that they cannot make as many trips as they would like.

Some 45% stated there were no such constraints. Thus, a slight majority (55%) identified at least one constraint. These are reported at **Table 6.5,** over.

The length of journey is by far the main constraint on trip-making between the Oban and Campbeltown areas. It is a constraint for over half of all the respondents (i.e. including those who do not face any constraints). It is by very far the most common among the constraints that were identified.

TABLE 6.5: CONSTRAINTS ON TRIP-MAKING		
Constraint	**All That Apply**	**Most Common**
The journey takes too long	54%	88%
Public transport timetable is at the wrong time	10%	6%
Can't make a day trip	5%	6%
Road quality	5%	0%
Fare levels on public transport are too expensive	2%	0%

Note: Results for "All That Apply" are % of all respondents, including those whose trip making is not constrained

Interest In Using an Oban-Campbeltown Air Service

Respondents were then asked whether they would be interested in using an air service between Oban and Campbeltown with a flight time of around 50 minutes. Their answers are shown at **Table 6.6**.

TABLE 6.6: INTERESTED IN USING AN OBAN-CAMPBELTOWN AIR SERVICE?		
Response	**Number of Respondents**	**Share of Respondents**
Yes	32	78%
No	8	20%
Don't Know	1	2%
Total	41	100%

More than three quarters (32 of all respondents to the survey) stated they would be interested in using the service. Almost all of the rest (20) of all respondents to the question) were not interested.

Some seven of the "No" respondents provided additional information on why they would not be interested in using the service. The following were each identified by two respondents:

- Need to accompany own vehicle.
- Can easily make the journey by car.
- Air service would offer little or no journey time saving.

Those interested in using the service were then asked how many single trips per year they might make on the service at various fare levels. The results are shown at **Table 6.7**.

TABLE 6.7: POTENTIAL TRIP-MAKING ON THE AIR SERVICE		
One Way Fare	**Number of Respondents Who Would Use The Service**	**Number of Single Trips Per Annum**
£65	47	234
£85	8	25
£105	3	10
£125	2	8

Some 47 individuals stated they would use the service at a one way fare of £65. However, demand drops dramatically when the fare is increased to £85 or above, with revenues to the operator at their highest under the lowest fare.

Respondents were also asked how their use of an Oban-Campbeltown flight would vary throughout the year. The results are given at **Table 6.8**.

TABLE 6.8: SEASONAL VARIATION IN NUMBER OF TRIPS ON OBAN-CAMPBELTOWN AIR SERVICE

Variation	Share of Respondents
I would make the same number of trips in the summer (April-September) as in the winter(October-March)	54%
Most of the trips would be in the summer (April-September)	23%
All of the trips would be in the summer (April-September)	17%
Most of the trips would be in the winter (October-March)	2%
All of the trips would be in the winter (October-March)	4%
Total	**100%**

Most (54%) would make the same number of trips all year round. Among the rest, there would be more trips made in summer than in winter.

Possible Impact on Overall Trip Making

The service would stimulate total trip making between the two locations. Approaching one third (31%) of those who would be interested in using the service said that all their flights would be new trips between the Oban and Campbeltown areas. In contrast, 37% said their flights would be trips that are currently made by surface transport. Finally, 33% said that *some* of their flights would be in place of existing surface trips.

However, there would be little impact on trip-making on the existing Glasgow-Campbeltown air service. This is because the large majority (79%) of those interested in using the Oban-Campbeltown service do not make use of the Glasgow flights. Only 6% thought the new service would lead to them making less use of Glasgow-Campbeltown.

Timetable Preferences

Respondents were asked what would be their preferred departure times for the service. The results are set out at **Table 6.9**, over.

There is very little demand for flights between 1000 and 1500. The clear preference is for flights ex Oban to be before 1000-and largely before 0900, with ex Campbeltown flights to be from 1500 onwards and mainly after 1700.

These results will reflect, the extent of potential business travel on the service (as per **Table 6.4**) with most of/a full working day at the destination being sought. They also indicate that most demand-at least among our survey respondents-would appear to originate in Oban rather than Campbeltown.

TABLE 6.9: PREFERRED DEPARTURE TIMES		
	Number of Respondents	
Departure Time	Flying from Oban	Flying from Campbeltown
Between 0800 and 0900	23	5
Between 0901 and 1000	13	5
Between 1001 and 1100	3	3
Between 1101 and 1200	0	0
Between 1201 and 1300	2	2
Between 1301 and 1400	0	0
Between 1401 and 1500	0	0
Between 1501 and 1600	1	6
Between 1601 and 1700	1	6
Between 1701 and 1800	4	19

The number of days of operation does not appear to have a significant impact on potential demand for an Oban-Campbeltown flight. Approaching three quarters (72%) of respondents stated that they would still make the same number of flights on the service if it operated on only three days of the week. A further one in six (17%) would reduce the number of flights by up to one half.

Respondents were asked to indicate which days would be the most useful for their travel if there was a three day per week service.

Each of the seven days of the week was to be placed in order where 1="most useful" and 7="least useful". The results are summarised at **Table 6.10.**

TABLE 6.10: DAY OF THE WEEK PREFERENCES UNDER A THREE DAY OPERATION		
Summer		
	First Preference=1 (Number of Respondents)	**Average Score**
Monday	14	2.6
Tuesday	8	2.7
Wednesday	11	2.7
Thursday	8	2.8
Friday	19	2.1
Saturday	8	3.8
Sunday	4	4.6
Winter		
	First Preference=1 (Number of Respondents)	**Average Score**
Monday	14	2.6
Tuesday	9	2.7
Wednesday	10	2.8
Thursday	8	2.8
Friday	17	2.2
Saturday	7	3.9
Sunday	5	4.2

Note: Overall results indicated by Orange=most useful, Blue=second most useful and Green=third most useful

They show, first, the number of respondents making a particular day their first choice (i.e. "most useful"). Second they give an average score for each day. The lower the average then the more useful it would be in general. This is takes into account the expression of second, third, etc., preferences rather than only the first preference.

Table 6.10 shows that Friday is the most preferred day of operation, followed quite closely by Monday. The preference for the third operating day is close between Wednesday and Tuesday. There is very little change in preferences between summer and winter.

Demand is more sensitive to the *number of rotations per day*, than to the *number of days* on which a service would operate. Respondents were asked to consider the effect on their potential use if only a single rotation was made-i.e. a day trip was not possible-on the service. Fewer than half (41%) said that this would have no effect. Over one in four (28%) would not use the service if it did not permit a day trip, with almost one in five (19%) stating that they would make one half fewer flights.

Final Comments

Respondents were also able, on an open-ended basis, to provide any further comments about a possible air service between Oban and Campbeltown. Some 21 respondents did so. They provided a wide range of comments which we grouped by theme. The most popular ones were:

- Air service would offer good time savings over surface travel (6 respondents).
- Need good public transport (bus) connections at the two airports (4).
- Fare levels would be a key determinant of the level of demand (4).

A.6.2 Business Responses

Current Trip Making Between The Oban Area and the Campbeltown Area

Business respondents were asked if they travel between the Oban area and the Campbeltown area and, if not, whether they would be interested in the possibility of an air service being developed between the two locations. Their answers are given at **Table 6.11**.

TABLE 6.11: CURRENT TRIP MAKING/INTEREST IN AN OBAN-CAMPBELTOWN AIR SERVICE

Response	Number of Respondents	Share of Respondents
I travel between the Oban area and the Campbeltown area	17	31%
I do not travel between the Oban area and the Campbeltown area-but am interested in using flights between Oban and Campbeltown	9	16%
I don't presently travel between the Oban area and the Campbeltown area-and am not interested in flights between Oban and Campbeltown	29	53%
Total	**55**	**100%**

A total of 55 respondents answered this question. Around one in three (31%) presently make trips between the two areas. A further 16 % do not presently travel between the two locations but are interested in using flights if they were operated.

Thus, approaching half (26 respondents) have a potential interest in an air service. The remainder do not currently travel between the two locations and are not interested in doing so even if an air route was established.

Some 15 respondents provided information on their current trip making between the two locations. In total they make 197 return trips per year, which represents a simple average of around 13 trips per person. The actual range is between one and 60 return trips per year.

Table 6.12 shows the distribution of their trips throughout the year.

TABLE 6.12: SEASONALITY OF CURRENT TRIP-MAKING	
Season	**Share of Annual Trips**
Main summer (June, July, August)	35%
Winter (January, February, March, November, December)	35%
Other times of year (April, May, September, October)	30%
Total	**100%**

They are spread quite evenly across the three time periods in question.

Current travellers were then asked how long they usually spend their destination before making the return leg of the journey. As shown at **Table 6.13**, the trips are of quite short duration. None is longer than 1 day and for more than half (53%) it lasts only a working day or less.

TABLE 6.13: LENGTH OF TIME AT DESTINATION	
Time	**Share of Respondents**
A working day or less	53%
Up to 24 hours	0%
1 day	47%
2 days	0%
3-7 days	0%
More than 7 days	0%
Total	**100%**

Travel is usually almost all by private or company vehicles. These are used by 93% of respondents. The other 7% usually travel by *either* public transport or car.

Current travellers also provided information on the purposes of the trips they make between the Oban and Campbeltown areas. The main trip types they identified are set out at **Table 6.14**, over.

Business travel dominates. Almost all (93%) of those responding to the question make some business trips between the two areas, and for over 80% business is the most common trip type. Other types of trip are made but much less frequently.

TABLE 6.14: PURPOSES OF TRIPS BETWEEN THE OBAN AND CAMPBELTOWN AREAS: MOST POPULAR RESPONSES		
Purpose	**All That Apply**	**Most Common Trip Purpose**
Business travel	93%	82%
Visiting friends and relatives (VFR)	14%	0%
Shopping	14%	0%
Education	7%	9%
Travel to regular place of work	7%	9%

Existing Constraints on Trip Making

Respondents were then asked if there is anything about the current journey between the Oban and Campbeltown areas that means that they cannot make as many trips as they would like.

More than half (64%) stated there were no such constraints. Thus, around one in three (36%) identified a constraint. This was solely that the current journey takes too long.

Interest In Using an Oban-Campbeltown Air Service

Respondents were then asked whether they would be interested in using an air service between Oban and Campbeltown with a flight time of around 50 minutes. Their answers are shown at **Table 6.15**.

TABLE 6.15: INTERESTED IN USING AN OBAN-CAMPBELTOWN AIR SERVICE?		
Response	**Number of Respondents**	**Share of Respondents**
Yes	19	47%
No	16	40%
Don't Know	5	13%
Total	**41**	**100%**

Approaching half (19 of all respondents to the business survey) stated they would be interested in using the service. The vast majority of the all of the rest (16 respondents) were not interested.

Those interested in using the service were then asked how many single trips per year they might make on the service at various fare levels. The results are shown at **Table 6.16**.

TABLE 6.16: POTENTIAL TRIP-MAKING ON THE AIR SERVICE		
One Way Fare	**Number of Respondents Who Would Use The Service**	**Number of Single Trips Per Annum**
£65	8	105
£85	3	30
£105	2	14
£125	2	14

Only eight individuals stated they would use the service at a one way fare of £65. This compares to 19 respondents who had previously stated that they were interested in using the service (as per **Table 6.15**).

Demand drops dramatically when the fare is increased to £85 or above. Revenues to the operator would be highest under the lowest (£65) fare.

Respondents were also asked how their use of an Oban-Campbeltown flight would vary throughout the year. The results are given at **Table 6.17**.

TABLE 6.17: SEASONAL VARIATION IN NUMBER OF TRIPS ON OBAN-CAMPBELTOWN AIR SERVICE

Variation	Share of Respondents
I would make the same number of trips in the summer (April-September) as in the winter(October-March)	67%
Most of the trips would be in the summer (April-September)	22%
All of the trips would be in the summer (April-September)	0%
Most of the trips would be in the winter (October-March)	0%
All of the trips would be in the winter (October-March)	11%
Total	**100%**

Two in three (67%) respondents would make the same number of trips all year round. Among the rest, there would be more trips made in summer than in winter.

Possible Impact on Overall Trip Making

The service would stimulate total trip making between the two locations. One in five (20%) of those who would be interested in using the service said that all their flights would be new trips between the Oban and Campbeltown areas. A further 40% said that *some* of their flights would be in place of existing surface trips.

The survey also indicates that there would be no displacement of trips from the existing Glasgow-Campbeltown air service.

More than half (62%) of those interested in using the Oban-Campbeltown service do not make use of the Glasgow flights. The other 38% do use the Glasgow route but would not make less trips on it as a result of using Oban-Campbeltown.

Timetable Preferences

Respondents were asked what would be their preferred departure times for the service. The results are set out at **Table 6.18,** over.

There is very little demand for flights between 1000 and 1600. The clear preference is for flights ex Oban to be before 1000 with ex Campbeltown flights to be from 1600 onwards. The results also indicate that most demand-at least among our survey respondents-appears to originate in Oban rather than Campbeltown.

TABLE 6.18: PREFERRED DEPARTURE TIMES		
	Number of Respondents	
Departure Time	Flying from Oban	Flying from Campbeltown
Between 0800 and 0900	4	1
Between 0901 and 1000	3	0
Between 1001 and 1100	0	0
Between 1101 and 1200	0	0
Between 1201 and 1300	0	0
Between 1301 and 1400	0	0
Between 1401 and 1500	1	0
Between 1501 and 1600	0	0
Between 1601 and 1700	0	5
Between 1701 and 1800	1	3

The number of days of operation does not appear to have a significant impact on potential demand for an Oban-Campbeltown flight. Two thirds (67%) of respondents stated that they would still make the same number of flights on the service if it operated on only three days of the week. All of the rest (33% of respondents) would reduce the number of flights by up to one half.

Respondents were asked to indicate which days would be the most useful for their travel if there was a three day per week service. Each of the seven days of the week was to be placed in order where 1="most useful" and 7="least useful". The results are summarised at **Table 6.19**.

TABLE 6.19: DAY OF THE WEEK PREFERENCES UNDER A THREE DAY OPERATION		
Summer		
	First Preference=1 (Number of Respondents)	Average Score
Monday	6	1.9
Tuesday	2	2.7
Wednesday	3	2.7
Thursday	2	3.0
Friday	3	2.9
Saturday	2	3.3
Sunday	4	2.0
Winter		
	First Preference=1 (Number of Respondents)	Average Score
Monday	6	1.9
Tuesday	2	2.7
Wednesday	3	2.6
Thursday	2	3.0
Friday	3	2.9
Saturday	2	3.3
Sunday	4	2.7

Note: Overall results indicated by Orange=most useful, Blue=second most useful and Green=third most useful

They show, first, the number of respondents making a particular day their first choice (i.e. "most useful"). Second they give an average score for each day. The lower the average then the more useful it would be in general. This is takes into account the expression of second, third, etc., preferences rather than only the first preference.

Table 6.19 shows that Monday is the most preferred day of operation, followed by Sunday. The other days have similar preference levels. There is very little difference in the results for summer and winter.

Demand is more sensitive to the *number of rotations per day*, than to the *number of days* on which a service would operate. Respondents were asked to consider the effect on their potential use if only a single rotation was made-i.e. a day trip was not possible- on the service. Some 44% would not use the service of that was the case, although the same amount (44%) would still make the same number of flights.

A.7 FINDINGS: OBAN-GLASGOW

A.7.1 Personal Responses

Current Trip Making Between The Oban Area and the Glasgow Area

Respondents were asked if they travel between the Oban area and the Glasgow area (including ultimate origins and destinations beyond) and, if not, whether they would be interested in the possibility of an air service being developed between the two locations. Their answers are given at **Table 7.1**.

TABLE 7.1: CURRENT TRIP MAKING/INTEREST IN AN OBAN-GLASGOW AIR SERVICE

Response	Number of Respondents	Share of Respondents
I travel between the Oban area and the Glasgow area	190	71%
I do not travel between the Oban area and the Glasgow area-but am interested in using flights between Oban and Glasgow	18	7%
I don't presently travel between the Oban area and the Glasgow area-and am not interested flights between Oban and Glasgow	60	22%
Total	**268**	**100%**

A total of 268 respondents answered this question. A clear majority (over 70%) presently make trips between the two areas. A further 7% do not presently travel between the two locations but are interested in using flights if they were operated.

Thus, 78% (208 respondents) have a potential interest in an air service. The remainder do not currently travel between the two locations and are not interested in doing so even if an air route was established.

Some 181 respondents provided information on their current trip making between the two locations, including those with trip ends beyond the Glasgow area.

In total they make 2,558 return trips per year, which represents a simple average of around 14 trips per person. The actual range is between 1 and 60 return trips per year.

Table 7.2 shows the distribution of their trips throughout the year.

TABLE 7.2: SEASONALITY OF CURRENT TRIP-MAKING

Season	Share of Annual Trips
Main summer (June, July, August)	35%
Other times of year (April, May, September, October)	30%
Winter (January, February, March, November, December)	35%
Total	**100%**

The number of trips is quite evenly spread between the three periods in question. However, it is clear that a majority of trips occurs between April and September.

Current travellers were then asked how long they usually spend their destination before making the return leg of the journey (see **Table 7.3**).

TABLE 7.3: LENGTH OF TIME AT DESTINATION	
Time	**Share of Respondents**
A working day or less	14%
Up to 24 hours	0%
1 day	17%
2 days	26%
3-7 days	28%
More than 7 days	15%
Total	**100%**

Most trips are relatively long in duration. Just one in seven appear to be day trips. Over two thirds usually involve two or more days at the destinations.

A clear majority (76%) of respondents usually make the trip by car. Almost all of the rest use public transport.

Current travellers also provided information on the purposes of the trips they make between the Oban and Glasgow areas. The main trip types they identified are set out at **Table 7.4**.

TABLE 7.4: PURPOSES OF TRIPS BETWEEN THE OBAN AND GLASGOW AREAS: MOST POPULAR RESPONSES		
Purpose	**All That Apply**	**Most Common Trip Purpose**
Visiting friends and relatives	75%	39%
Short break/holiday	64%	18%
Shopping	57%	12%
Business travel	47%	19%
Personal business	23%	3%
Health-related	21%	3%
Education	12%	2%
Travel to regular place of work	8%	3%

The highest number of references were to discretionary non-business trips-i.e. VFR, short break/holiday and shopping. In addition, approaching half (47%) of respondents make some business trips between the two locations.

VFR is clearly the most common trip purpose. It is so for almost 40% of respondents. However, while some short break/holiday and shopping trips are made between the Oban and Glasgow areas. Business is actually the second most common trip purpose-mentioned by around one in five people.

Existing Constraints on Trip Making

Respondents were then asked if there is anything about the current journey between the Oban and Glasgow areas that means that they cannot make as many trips as they would like.

Some 42% stated there were no such constraints. Thus, a majority (58%) identified at least one constraint. These are reported at **Table 7.5**.

TABLE 7.5: CONSTRAINTS ON TRIP-MAKING

Constraint	All That Apply	Most Common
The journey takes too long	53%	54%
Public transport timetable is at the wrong time	39%	25%
Fare levels on public transport are too expensive	16%	11%
Can't make a day trip	17%	10%

Note: Results for "All That Apply" are % of all respondents, including those whose trip making is not constrained

The main and most common factor that restricts the number of trips is travel time. Over half (53%) all respondents (including those who face no constraints) identified this as an issue. It is also the most common constraint that is faced.

The second most significant constraint is the timings of current train and bus services. This is much more of a constraint than the cost of public transport. Existing provision is not an important constraint on the ability to make away trip between the two locations.

Interest In Using an Oban-Glasgow Air Service

Respondents were then asked whether they would be interested in using an air service between Oban and Glasgow with a flight time of around 40 minutes. Their answers are shown at **Table 7.6**.

TABLE 7.6: INTERESTED IN USING AN OBAN-GLASGOW AIR SERVICE?

Response	Number of Respondents	Share of Respondents
Yes	166	82%
No	20	10%
Don't Know	16	8%
Total	**202**	**100%**

The vast majority (over 80%, 166 respondents) stated that they would be interested in using a service. Only one in ten stated that they would not do so.

Some 17 of the "No" respondents provided additional information on why they would not be interested in using the service. By category the most common reasons were:

- No or little journey time saving over surface transport (6 respondents).
- Need to have own vehicle at destination (4).
- Expected cost of air fare (3).

Those interested in using the service were asked how many single trips per year they might make on the service at various fare levels. The results are shown at **Table 7.7**.

TABLE 7.7: POTENTIAL TRIP-MAKING ON THE AIR SERVICE		
One Way Fare	**Number of Respondents Who Would Use The Service**	**Number of Single Trips Per Annum**
£65	149	1,097
£85	49	368
£105	21	72
£125	13	26

At a £65 single fare, the vast majority of the 166 who had expressed interest in using the service (as per **Table 7.6**) would make some trips on the service-at a simple average of between three and four return trips per year.

For each fare band, the majority of respondents would make no more than three return flights per year on the service. Thus, overall demand would be quite reliant on a small core of frequent flyers.

As with the other routes, demand falls very sharply when the fare is increased to £85 or beyond. The proportionate decrease in trips is greater than the proportionate increase in fares. Thus, the operator would lose revenues at the higher fare bands compared to the £65 single fare level.

Respondents were also asked how their use of an Oban-Glasgow flight would vary throughout the year. The results are given at **Table 7.8**.

TABLE 7.8: SEASONAL VARIATION IN NUMBER OF TRIPS ON OBAN-GLASGOW AIR SERVICE	
Variation	**Share of Respondents**
I would make the same number of trips in the summer (April-September) as in the winter (October-March)	74%
Most of the trips would be in the summer (April-September)	16%
Most of the trips would be in the winter (October-March)	5%
All of the trips would be in the summer (April-September)	3%
All of the trips would be in the winter (October-March)	3%
Total	**100%**

A clear majority (74%) would make as many trips in the summer as in the winter. Most of the rest would fly more often in the summer. However, very few people would fly exclusively in either the winter or summer months.

Possible Impact on Overall Trip Making

The service's ability to stimulate new trips between the two areas appears quite limited. Only 13% said that the flights they would make on the new service would be new wholly new trips. A majority (57%) said some of the flights would be new trips, while 30% said that all of them, would be current trips diverted from surface to air travel.

Timetable Preferences

Respondents were asked what would be their preferred departure times for the service. The results are set out at **Table 7.9**.

TABLE 7.9: PREFERRED DEPARTURE TIMES		
	Number of Respondents	
Departure Time	**Flying from Oban**	**Flying from Glasgow**
Between 0700 and 0800	55	5
Between 0801 and 0900	41	7
Between 0901 and 1000	19	10
Between 1001 and 1100	6	9
Between 1101 and 1200	6	7
Between 1201 and 1300	3	2
Between 1301 and 1400	1	4
Between 1401 and 1500	1	4
Between 1501 and 1600	4	9
Between 1601 and 1700	9	15
Between 1701 and 1800	2	19
Between 1801 and 1900	4	57

In contrast to the Oban-Campbeltown route, there is some demand for flights between 1000 and 1500. However, the main demand is for departures from Oban up to 0900 and, to a slightly lesser extent, departures from Glasgow from 1600 onwards-and particularly post-1700. The results also imply that most of the trips-at least among our survey respondents-would originate in Oban rather than Glasgow.

As indicated by **Table 7.10** departure preferences will be influenced, to an extent, by a desire to connect with flights at Glasgow.

TABLE 7.10: ON HOW MANY OCCASIONS WOULD YOU BE LOOKING TO CONNECT WITH ANOTHER FLIGHT AT GLASGOW AIRPORT?	
Response	**Share of Respondents**
None	25%
Up to a third	27%
Around a half	17%
Around three quarters	11%
All	20%
Total	**100%**

Three quarters would be looking to connect over Glasgow on at least some occasions. Some 20% would be doing so for all their Oban-Glasgow flights, while a further 28% would be doing so at least half the time.

The ability to *make a day trip using the service* would influence potential demand for an Oban-Glasgow service.

More than half (60%) of respondents stated that they would still make the same number of flights on the service if only a single rotation was operated. However, around one in five (21%) would reduce the number of flights by up to one half-while around the same amount would make less than half their desired number of flights (13%) or would not use the service at all.

Most (52%) would make fewer flights on the service if it *operated on only three days per week*. Of these a majority (equal to 39% of all respondents) would reduce the number of flights by up to 50%. Only 2% would not use the service at all.

Respondents were asked to indicate which days would be the most useful for their travel if there was a three day per week service. Each of the seven days of the week was to be placed in order where 1="most useful" and 7="least useful". The results are summarised at **Table 7.11**.

TABLE 7.11: DAY OF THE WEEK PREFERENCES UNDER A THREE DAY OPERATION		
Summer		
	First Preference=1 (Number of Respondents)	**Average Score**
Monday	58	2.2
Tuesday	26	3.4
Wednesday	32	3.2
Thursday	25	3.4
Friday	77	1.9
Saturday	50	2.8
Sunday	48	2.7
Winter		
	First Preference=1 (Number of Respondents)	**Average Score**
Monday	49	2.3
Tuesday	22	3.6
Wednesday	27	3.2
Thursday	20	3.5
Friday	64	1.7
Saturday	41	2.8
Sunday	45	2.4

Note: Overall results indicated by Orange=most useful, Blue=second most useful and Green=third most useful

They show, first, the number of respondents making a particular day their first choice (i.e. "most useful"). Second they give an average score for each day. The lower the average then the more useful it would be in general. This is takes into account the expression of second, third, etc., preferences rather than only the first preference.

Table 7.11 shows that Friday is clearly the most preferred day of operation, followed quite closely by Monday. The third preference is for flights at the weekend.

Final Comments

Respondents were also able, on an open-ended basis, to provide any further comments about a possible air service between Oban and Glasgow. Some 85 respondents did so. They provided a wide range of comments which we grouped by theme.

The most popular ones were:

- Importance of air fares being reasonable/comparable to surface travel costs/lower than tested in the survey (20 respondents).
- Need to connect with flights at Glasgow, mostly in relation to London services (20).
- References to visitor use/benefits (8).
- References to business use/benefits (7).
- Time saving benefits (7).
- Would prefer an Oban-Edinburgh route (6).
- Air service needed due to poor surface transport links (6).

A.7.2 Business Responses

Current Trip Making Between The Oban Area and the Glasgow Area

Business respondents were asked if they travel between the Oban area and the Glasgow area (including ultimate origins and destinations beyond) and, if not, whether they would be interested in the possibility of an air service being developed between the two locations. Their answers are given at **Table 7.12.**

TABLE 7.12: CURRENT TRIP MAKING/INTEREST IN AN OBAN-GLASGOW AIR SERVICE

Response	Number of Respondents	Share of Respondents
I travel between the Oban area and the Glasgow area	38	81%
I do not travel between the Oban area and the Glasgow area-but am interested in using flights between Oban and Glasgow	4	9%
I don't presently travel between the Oban area and the Glasgow area-and am not interested flights between Oban and Glasgow	5	11%
Total	**47**	**100%**

A total of 47 respondents answered this question. The vast majority (over 80%) presently make trips between the two areas. A further 9% do not presently travel between the two locations but are interested in using flights if they were operated.

Thus, 90% (42 respondents) have a potential interest in an air service. The remainder do not currently travel between the two locations and are not interested in doing so even if an air route was established.

Some 37 respondents provided information on their current trip making between the two locations, including those with trip ends beyond the Glasgow area.

In total they make 644 return trips per year, which represents a simple average of around 17 trips per person. The actual range is between 3 and 60 return trips per year.

Table 7.13, over, shows the distribution of their trips throughout the year. Most (38%) occur in the winter period. However, the distribution is fairly even across the three periods as a whole.

TABLE 7.13: SEASONALITY OF CURRENT TRIP-MAKING	
Season	**Share of Annual Trips**
Winter (January, February, March, November, December)	38%
Main summer (June, July, August)	31%
Other times of year (April, May, September, October)	31%
Total	**100%**

Current travellers were then asked how long they usually spend their destination before making the return leg of the journey (see **Table 7.14**).

TABLE 7.14: LENGTH OF TIME AT DESTINATION	
Time	**Share of Respondents**
A working day or less	22%
Up to 24 hours	0%
1 day	30%
2 days	24%
3-7 days	22%
More than 7 days	3%
Total	**100%**

Very few trips involve more 7 days at the destination. Around one in five (22%) last a working day or less. The remainder last between 1 and 7 days-although largely towards the lower end of this range.

The vast majority (84%) of respondents usually make the trip by car rather than public transport.

Current travellers also provided information on the purposes of the trips they make between the Oban and Glasgow areas. The main trip types they identified are set out at **Table 7.15**.

TABLE 7.15: PURPOSES OF TRIPS BETWEEN THE OBAN AND GLASGOW AREAS: MOST POPULAR RESPONSES		
Purpose	**All That Apply**	**Most Common Trip Purpose**
Business travel	91%	66%
Visiting friends and relatives	57%	16%
Shopping	49%	6%
Short break/holiday	40%	3%
Health-related	14%	3%
Travel to regular place of work	11%	3%
Education	9%	3%

Among our sample, business travel dominates. Almost all (91%) make some trips for business purposes. For two thirds these are the most common trip types. Other, non-business trips are made between the Oban and Glasgow areas but at a much lower frequency than those for business purposes.

Existing Constraints on Trip Making

Respondents were then asked if there is anything about the current journey between the Oban and Glasgow areas that means that they cannot make as many trips as they would like.

More than half (57%) stated there were no such constraints. Thus, 43% identified at least one constraint. These are reported at **Table 7.16**.

TABLE 7.16: CONSTRAINTS ON TRIP-MAKING

Constraint	All That Apply	Most Common
The journey takes too long	57%	75%
Public transport timetable is at the wrong time	20%	5%
Can't make a day trip	14%	10%
Fare levels on public transport are too expensive	9%	10%

Note: Results for "All That Apply" are % of all respondents, including those whose trip making is not constrained

The main and most common factor that restricts the number of trips is travel time. Over half (57%) all respondents (including those who face no constraints) identified this as an issue. It is also very clearly the most common constraint that is faced.

Public transport timetabling and the inability to make a day trip are seen as broadly similar significant constraints. However, they are much less important than journey time.

Interest In Using an Oban-Glasgow Air Service

Respondents were then asked whether they would be interested in using an air service between Oban and Glasgow with a flight time of around 40 minutes. Their answers are shown at **Table 7.17**.

TABLE 7.17: INTERESTED IN USING AN OBAN-GLASGOW AIR SERVICE?

Response	Number of Respondents	Share of Respondents
Yes	30	73%
No	6	15%
Don't Know	5	12%
Total	**41**	**100%**

Approaching three quarters (30 respondents) stated that they would be interested in using a service. Some 15% stated that they would not do so.

Those interested in using the service were asked how many single trips per year they might make on the service at various fare levels. The results are shown at **Table 7.18**, over.

At a £65 single fare, the vast majority of the 30 respondents who had expressed interest in using the service (as per **Table 7.17**) would make some trips on the service- at a simple average of around six return trips per year.

TABLE 7.18: POTENTIAL TRIP-MAKING ON THE AIR SERVICE		
One Way Fare	**Number of Respondents Who Would Use The Service**	**Number of Single Trips Per Annum**
£65	26	319
£85	16	153
£105	9	70
£125	9	70

For each fare band, the majority of respondents would make no more than three return flights per year on the service. Thus, overall demand would be quite reliant on a small core of frequent flyers.

As with the other routes, demand falls very sharply when the fare is increased to £85 or beyond. The proportionate decrease in trips is greater than the proportionate increase in fares. Thus, the operator would lose revenues at the higher fare bands compared to the £65 single fare level.

Respondents were asked how their use of an Oban-Glasgow flight would vary throughout the year. The results are given at **Table 7.19**.

TABLE 7.19: SEASONAL VARIATION IN NUMBER OF TRIPS ON OBAN-GLASGOW AIR SERVICE	
Variation	**Share of Respondents**
I would make the same number of trips in the summer (April-September) as in the winter (October-March)	78%
All of the trips would be in the summer (April-September)	15%
All of the trips would be in the winter (October-March)	7%
Most of the trips would be in the summer (April-September)	0%
Most of the trips would be in the winter (October-March)	0%
Total	**100%**

More than three quarters (78%) would make as many trips in the summer as in the winter. Most of the rest would fly more often in the summer. None would fly exclusively in either the winter or summer months.

Possible Impact on Overall Trip Making

The service's ability to stimulate new trips between the two areas seems very limited. To an extent, this will reflect that business trips are less discretionary than those for leisure purposes. Only 4% said that the flights they would make on the new service would be new wholly new trips. However, a majority (59%) said *some* of the flights would be new trips, while 37% said that all of them, would be current trips diverted from surface to air travel.

Timetable Preferences

Respondents were asked what would be their preferred departure times for the service. The results are set out at **Table 7.20**, over.

TABLE 7.20: PREFERRED DEPARTURE TIMES		
	Number of Respondents	
Departure Time	**Flying from Oban**	**Flying from Glasgow**
Between 0700 and 0800	18	1
Between 0801 and 0900	2	1
Between 0901 and 1000	2	1
Between 1001 and 1100	0	0
Between 1101 and 1200	1	1
Between 1201 and 1300	0	0
Between 1301 and 1400	1	0
Between 1401 and 1500	0	1
Between 1501 and 1600	1	0
Between 1601 and 1700	0	3
Between 1701 and 1800	2	8
Between 1801 and 1900	0	11

Demand is very strongly for flights to operate outside office hours. Clear preference was expressed for an 0700-0800 departure ex Oban and a flight ex Glasgow between 1700 and 1900. The results also imply that very many of the trips-at least among our survey respondents-would originate in Oban rather than Glasgow.

As indicated by **Table 7.21** departure preferences will be influenced, to an extent, by a desire to connect with flights at Glasgow.

TABLE 7.21: ON HOW MANY OCCASIONS WOULD YOU BE LOOKING TO CONNECT WITH ANOTHER FLIGHT AT GLASGOW AIRPORT?	
Response	**Share of Respondents**
None	30%
Up to a third	30%
Around a half	7%
Around three quarters	15%
All	19%
Total	**100%**

Some 70% would be looking to connect over Glasgow on at least some occasions. Around 20% would be doing so for all their Oban-Glasgow flights, while a further 22% would be doing so at least half the time.

The ability to *make a day trip using the service* would influence potential demand for an Oban-Glasgow service. Slightly more than half (56%) of respondents stated that they would still make the same number of flights on the service if only a single rotation was operated. However, 30% would reduce the number of flights by up to one half-while a further 11% would make less than half their desired number of flights.

Most (56%) would make fewer flights on the service if it *operated on only three days per week*.

Of these, a majority (equal to 37% of all respondents) would reduce their number of flights by up to half. A further 19% would reduce their flights by more than half.

Respondents were asked to indicate which days would be the most useful for their travel if there was a three day per week service. Each of the seven days of the week was to be placed in order where 1="most useful" and 7="least useful". The results are summarised at **Table 7.22.**

TABLE 7.22: DAY OF THE WEEK PREFERENCES UNDER A THREE DAY OPERATION		
Summer		
	First Preference=1 (Number of Respondents)	**Average Score**
Monday	15	2.1
Tuesday	14	2.1
Wednesday	9	2.2
Thursday	9	2.8
Friday	11	2.8
Saturday	3	4.8
Sunday	5	4.1
Winter		
	First Preference=1 (Number of Respondents)	**Average Score**
Monday	15	2.3
Tuesday	14	2.1
Wednesday	9	2.1
Thursday	9	2.8
Friday	10	3.0
Saturday	3	5.0
Sunday	5	4.3

Note: Overall results indicated by Orange=most useful, Blue=second most useful and Green=third most useful

They show, first, the number of respondents making a particular day their first choice (i.e. "most useful"). Second they give an average score for each day. The lower the average then the more useful it would be in general. This is takes into account the expression of second, third, etc., preferences rather than only the first preference.

Table 7.22 shows that demand is focused mainly on the first half of the week- particularly Monday and Tuesday. There is also some, albeit lesser, demand for flights on a Friday. There is relatively little preference for a weekend service.

Final Comments

Respondents were also able, on an open-ended basis, to provide any further comments about a possible air service between Oban and Glasgow. Some 19 respondents did so. They provided a wide range of comments which we grouped by theme.

The most popular ones were:

- The importance of air fares being “reasonable” (5 respondents).
- Need to connect with flights at Glasgow (3).
- References to business use/benefits (3).
- The service would not be effective as part of trips between Barra & Uist and the Glasgow area (3).

Appendix B

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Appendix C

List of Consultees and Contributors

Argyll & Bute Council-Transportation
Comhairle nan Eilean Siar-Technical Services
Highland Council-TEC Services
Orkney Islands Council-Transportation
HIE-Senior Development Manager, Transport
SCDI

DG Move (EU)-Deputy Director

HIAL
Hebridean Airways
Loganair
Loch Lomond Seaplanes

Federation of Small Businesses-West of Scotland, Highland

Argyll and the Isles Tourism Partnership
Oban BID
Oban Airport
Scottish Association for Marine Science, Dunstaffnage
NHS Highland

Machrihanish Dunes Resort

VisitScotland-Outer Hebrides

EMEC Orkney (who also provided feedback from Scotrenewables, Voith, OpenHydro, Scottish Power)

Report Contributors

Basil O'Fee & Chris Cain	– Northpoint Aviation Ltd.
Tom Matthew	– Reference Economic Consultants
Naomi Bremner	– Spyria Partnership and Eyland Skyn
Kevin Wright	– Nineteen Hundred Aviation Ltd.
Capt. Linton Chilcott	– supporting Northpoint Aviation Ltd.

Appendix D

Twin Otter Maintenance Considerations

nineteen100
Regional Airline Solutions

Twin Otters for Scotland

Maintenance considerations

12th July 2013

1.0 EXECUTIVE SUMMARY

1.1 Introduction

- This report investigates maintenance issues relating to the current and future operation of Twin Otter aircraft on the PSO services in Scotland.
- In particular it attempts to determine:
  - the maintenance impact of replacing the existing two Twin Otter 300s operated by Loganair with two brand new Twin Otter 400 aircraft
  - whether having two Twin Otter 400s can lead to an expansion of the services offered to other "high performance" destinations (one option being the addition of services to Skye).
- Given that the Scottish Government's proposed purchase of Twin Otter 400s is intended to open up opportunities for other operators to bid for the PSO services some consideration has also been given to possible maintenance issues for a new Twin Otter operator.

1.2 Fleet redundancy

- Packaging the Barra services with the Campbeltown/Tiree services was a practical solution to the problem of providing fleet redundancy.
- In order to operate two Twin Otters on scheduled services that require their unique performance capability any operator is going to need access to either a third Twin Otter or be willing to accept severe service disruption in the event of an unscheduled failure and reduced service during scheduled maintenance downtime.
- Even with a third aircraft it would be beneficial if this was operated on a service that could be operated with "conventional performance" aircraft when required (i.e. in the same way that the Barra and Campbeltown/Tiree services are packaged today).

1.3 Corrosion

- Scotland and Barra in particular provide one of the world's worst environments for aircraft.
- Operating in to Barra adds a substantial burden of additional washing and lubrication to the existing maintenance schedule for the aircraft.
- Loganair has been required to modify its Twin Otter maintenance program in order to cope with the additional damage that results from regular operations in to the Barra beach landing strip.
- Even with the additional maintenance a new Twin Otter will age prematurely in the harsh environment of Scotland and Barra beach in particular.

1.4 Maintenance

- Discounting many out of phase tasks which are undertaken when required, the maintenance of the Twin Otter essentially boils down to:
  - Daily Service Inspections and washing (of the Barra aircraft)
  - Weekend Routine Inspection and more extensive washing of the engines in particular
  - Weekend Equalized Maintenance for Maximum Availability (EMMA) checks when due
  - Annual corrosion checks
- Increasing the utilisation of the aircraft will <u>not</u> impact the frequency of the daily Service Inspections or weekly Routine Inspections since these are based on calendar intervals.
- A new Twin Otter 400 will not significantly reduce the amount of maintenance required to carry out the daily Service Inspections and weekend Routine Inspections and washing tasks compared with the older Twin Otter 300s.
- Increasing the utilisation of the aircraft <u>will</u> increase the frequency of the EMMA checks and therefore the workload during the weekends when these take place.
- A new Twin Otter 400 should benefit from reduced defect rectification arising from the EMMA checks compared with the older Twin Otter 300s. However this will not increase the availability of the aircraft since these are generally carried out at weekends.
- Increasing the utilisation of the aircraft will <u>not</u> impact the frequency of the Corrosion Inspections since they are based on calendar intervals.
- A new Twin Otter 400 will initially benefit from much lower maintenance relative to the current annual corrosion inspections on the Twin Otter 300. These will not be required immediately and when they are the amount of defect rectification required should be substantially less, at least in the early years. More importantly it will reduce the downtime of the aircraft.

1.5 Maintenance cost

- A survey of the maintenance costs of the Twin Otter 300 has concluded that at a typical annual utilisation of 1,500FH/2,500FC the maintenance cost will be of the order of US$732/FH (GBP472/FH).
- The equivalent cost estimate for a new Twin Otter 400 aircraft is of the order of US$590/FH (GBP381/FH). However the costs of the Twin Otter 400 will rapidly rise to similar levels to the existing Twin Otter 300s as the aircraft suffers from the premature ageing effect of operating in to Barra.

1.6 Other maintenance considerations

- Since leaving the factory many Twin Otters will have been practically rebuilt with new wings, new engines, avionics, propellers, etc. and the major components have been overhauled several times over.
- There is no reason why the Twin Otter cannot go on almost indefinitely (subject to the fatigue life limitations detailed in Sections 6.2 and 6.3). Based upon the experience of the ten first production Twin Otters a life of 50 years is not unreasonable.
- The Twin Otter 300/400 wing box has a fatigue life of 33,000 hours/66,000 cycles. At a utilisation of approximately 1,500 hours/2,500 cycles per year the fatigue life of the Twin Otter wing box will have been consumed within 22 years. At this point the aircraft will still have a future ahead of it but it will require an expensive wing modification after which the aircraft will be good for at least another 22 years.
- The Twin Otter 300/400 fuselage has a fatigue life of 66,000 hours/132,000 cycles. At a utilisation of approximately 1,500 hours/2,500 cycles per year the fatigue life of a new production Twin Otter 400 fuselage box will not be consumed until 44 years have elapsed.
- If the Twin Otter operation is expanded to incorporate more services by increasing the utilisation of the aircraft then its fatigue life will be consumed more quickly and the expense of modification or replacing the wing box will need to be considered along with the downtime for the modification.

1.7 Loganair advantages

- The purchase of two Twin Otters by the Scottish Government opens up opportunities for other operators to bid for the Barra PSO. However several issues make it difficult for any new Twin Otter operator to put forward a credible alternative to Loganair.
- Unless serious consideration is given to how to overcome issues relating to personnel, maintenance, performance standards and spares it is likely that the Twin Otter operation to Barra will remain with Loganair as the only realistic option.

1.8 Floatplane options

- The Twin Otter seaplane/amphibian is simply not a viable option for Barra because the weight impact of the floats reduces the passenger payload from the 13 passengers of the landplane to nine passengers for the seaplane and less than six for the amphibian.
- The Twin Otter seaplane/amphibian is more suitable for Skye where the seaplane is limited to 15 passengers and the amphibian to 12. Assuming that a direct connection with Glasgow Airport would be preferred then the amphibian will be required and its payload of 12 passengers compares unfavourably with the 19 passengers available with a landplane.

1.9 Overall summary

- The existing Loganair Twin Otter operation is a well thought out solution to the problem of ensuring a reliable air service to Barra.
- Replacing the two existing Twin Otter 300 aircraft operated by Loganair with two new production Twin Otter 400s will not in itself open up opportunities to expand the existing network of services. The only immediate benefit will be a reduction in downtime during the aircrafts annual corrosion inspection.
- An attempt to expand the Twin Otter operation to incorporate more “high performance” destinations, Skye for example, is going to impact the reliability of the existing Barra service. There is simply not the fleet redundancy in the system.
- A new Twin Otter operator is going to face a number of challenges which need to be addressed along with the provision of the aircraft.

2.0 FLEET REDUNDANCY

2.1 Back-up capacity

2.1.1 Theory

In order to ensure that scheduled airline services do not suffer service disruption due to either scheduled or unscheduled maintenance events airline operators have to provide for some form of redundancy in their fleets. For example in an ideal world an operator would have a fleet consisting of the number of aircraft required to operate the schedule, the "scheduled fleet", an "operational spare" to cover short term unscheduled failures and a "maintenance spare" to cover for aircraft that are undergoing long term scheduled maintenance.

The requirement for the "operational spare" will be determined by the number of unscheduled failures, in other words the reliability of the aircraft type, but for fleets of up to ten aircraft it is assumed that one aircraft is sufficient. The requirement for a "maintenance spare" depends upon the annual downtime required for long-term scheduled maintenance (i.e. maintenance that cannot be carried out over quiet periods, usually the weekend). The Twin Otter requires a longer downtime than similarly sized/complex aircraft due to the environment that it is operated in. As a rough guide it is assumed that each aircraft will require two months downtime for scheduled maintenance per year (six weeks scheduled and two weeks unscheduled). In other words one "maintenance spare" will cover an overall fleet of six aircraft (four scheduled, one "operational spare" and one "maintenance spare". In this theoretical ideal world the total size of a fleet would vary with the scheduled fleet size as follows:

Scheduled fleet	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**
Operational spare	1	1	1	1	1	1	1	1	1	1
Maintenance spare	1	1	1	1	2	2	2	2	2	3
Total fleet	3	4	5	6	8	9	10	11	12	14
Operational	33%	50%	60%	67%	63%	67%	70%	73%	75%	71%

Clearly the larger the fleet the smaller the "relative" requirement for "spare" capacity and therefore the higher the efficiency of the operation. The larger fleets also benefit from the fact that when one of their aircraft fails it is not always disrupting the lives of the same people on the same routes. Taking Loganair as an example when one of their fleet of 14 passenger Saab 340Bs fails it can be one of many routes that suffers whereas with only two Twin Otters (one of which can be replaced with a Saab 340B anyway) it is usually Barra that would see disruption.

This is not a perfect world and for particularly small fleets it has to be accepted that having both an operational spare and a maintenance spare would be a "utopian provision". Compromises have to be made and alternative solutions found. Most commonly the operational spare and the maintenance spare are either one and the same or do not exist at all. Even with a combined operational/maintenance spare when the scheduled aircraft goes in for heavy maintenance the operational/maintenance spare is lost and a subsequent unscheduled failure will result in a complete loss of the service.

2.1.2 Practice - Loganair experience pre-June 2000

Until June 2000 Loganair operated the services to Barra with a single Twin Otter but the result was complete service disruption in the event of unscheduled failures or even scheduled maintenance.

2.1.3 Practice - Loganair's solution post-June 2000

From June 2000 Loganair introduced a second Twin Otter. The way that Loganair operates the two Twin Otters gets around the issue of back-up capacity by operating one Twin Otter on the Glasgow – Barra services and the other Twin Otter on the Glasgow - Campbeltown – Tiree services. The latter do not require the performance of the Twin Otter, it is more a function of the passenger demand, which for most of the year is better suited to a 19-seat Twin Otter than a 34 seat Saab 340B. Note that during certain busy times of the year the Saab 340B is substituted.

In the event that one of the Twin Otters is not available the remaining Twin Otter operates the Glasgow – Barra services and a Saab 340B is brought in to operate the Glasgow - Campbeltown – Tiree services. In effect Loganair are operating a three aircraft fleet with their spare Saab 340B capacity acting as the "operational spare" and "maintenance spare" for the two aircraft Twin Otter fleet.

2.2 Scheduled maintenance downtime

2.2.1 Background

Scheduled maintenance (not to be confused with unscheduled maintenance see Section 2.3) is essentially the accomplishment of the scheduled inspections called up by the manufacturer's maintenance program and the replacement of components that have reached their fixed life/overhaul interval. The maintenance program for the Twin Otter varies with different operators but the manufacturer's basic program is as follows (see Section 4.0 for more details):

Pre-flight inspection	Prior to each flight (carried out by the flight crew)
Service Inspection	Every two days
Routine Inspection	Every week
EMMA	Every 125FH
Corrosion	Every five years (block) or every year (equalised)

The pre-flight, Service Inspection and Routine Inspection are all line checks which can be accommodated without service disruption. The EMMA check can just about be carried out over a weekend but in the event that significant findings result (particularly those for which replacement components are not immediately available) the aircraft may not be ready to return to service on the following Monday morning.

The most significant inspections are those relating to corrosion. An operator has the choice between a single "block" corrosion inspection every five years or breaking this inspection down in to five annual "equalised" inspections, each one concentrating on a particular area of the aircraft. Loganair carry out annual corrosion inspections but even these require a substantial downtime, measured in months rather than weeks.

2.2.2 Maintenance facilities

Loganair has a complete in-house maintenance capability on the Twin Otter at its main hangar facility at Glasgow Airport. Another operator might have to ferry the aircraft some distance in order to carry out base maintenance. There are only three known maintenance facilities for the Twin Otter in the UK:

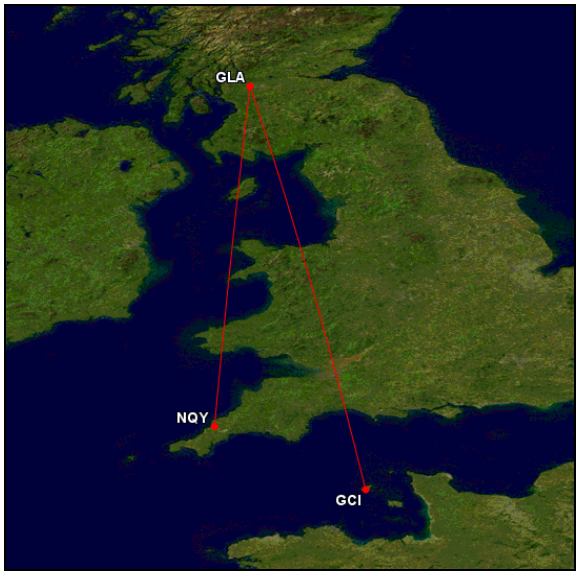
- Anglo Normandy Aeroengineering, Guernsey, Channel Islands
- Isles of Scilly Skybus, Newquay Airport, Cornwall
- Loganair, Glasgow

In the past Cormack Aircraft Services, whose facilities are at Cumbernauld, Scotland has performed maintenance on the Loganair Twin Otters. However this was under Loganair's maintenance approval.

2.2.3 Ferry time

The ferry time to the Loganair facility is obviously zero but the time to ferry the aircraft from Glasgow to either of the other two UK facilities is going to be substantial and have a direct impact on the downtime. This is particularly critical for the EMMA checks which are already difficult to complete over a weekend.

Journey	Airport codes	Distance	Block time
Glasgow - Newquay	GLA-NQY	327nm	2:00
Glasgow - Guernsey	GLA-GCI	392nm	2:21



In addition to the four to five hours total time lost there is the impact on the check interval. For example assuming an EMMA check has an interval of 125FH then four or five of these hours will be lost making the ferry flight i.e. only 120/121FH are available for commercial flying.

One further benefit of having both aircraft at Glasgow, even if one of them is in the hangar undergoing lengthy maintenance, is that there is a ready made spares supply in the event that the remaining "operational" aircraft requires a component.

2.2.4 Block corrosion inspections

In theory the downtime could be reduced by opting to move away from the annual "equalised" corrosion inspection to a "block" corrosion inspection every five years. To cover the period when this intensive workscope is being performed alternative aircraft could possibly be leased in. However although this might be a suitable alternative for some Twin Otter operators, particular those in dry arid climates, it is almost certainly not a suitable option for the highly corrosive environment in Scotland and at Barra in particular.

2.3 Unscheduled maintenance downtime

2.3.1 Background

Unscheduled maintenance is the correction of defects that have arisen during the operation of the aircraft. The schedule disruption caused can vary enormously from a few minutes delay to wholesale cancellations. Many defects can be resolved quickly providing the operator has both experienced engineers to troubleshoot the problem and a good spares stock on site.

2.3.2 Experience

Loganair has been operating the Twin Otter since 1977 (into Barra since 1981) and has clearly built up a great amount of experience rectifying defects on the type. Trouble shooting defects that an experienced operator has seen many times before is clearly easier than it would be for a new operator of the type.

2.3.3 Twin Otter 400

The introduction of new Twin Otter 400 aircraft should have a positive impact on unscheduled maintenance downtime. With all new components, wiring, etc. the number of unscheduled failures in the early "honeymoon" period will hopefully be greatly reduced compared with the two existing Loganair Twin Otter 300s (both of which were manufactured in 1980).

With the exception of the flightdeck and avionics the airframe and most of the systems installed on the Twin Otter 400 are essentially the same as those fitted to the Twin Otter 300. Therefore apart from any quirks with the new avionics systems the Twin Otter 400 should not introduce many new problems for an experienced Twin Otter operator.

However even an experienced Twin Otter operator will need to invest in training for their engineers and additional spares to reflect the new systems. The latter is discussed further in Section 7.8.

2.4 Summary

2.4.1 Pre-June 2000 Twin Otter operation (one Twin Otter)

Prior to June 2000 Loganair operated a single Twin Otter and was not able to accommodate even a single event (scheduled or unscheduled loss of the Twin Otter) without losing the service to Barra.

	Barra	Campbeltown /Tiree
Scheduled operation	Normal service (Twin Otter)	Normal service (Saab 340B)
Single event	No service (Twin Otter)	Normal service (Saab 340B)

2.4.2 Current Twin Otter operation (two Twin Otters)

The current operation is able to accommodate a single event (scheduled or unscheduled loss of one Twin Otter) without disruption to the Barra service. Clearly if a dual event (scheduled or unscheduled loss of both Twin Otters) occurred then there would be no service.

	Barra	Campbeltown /Tiree
Scheduled operation	Normal service (Twin Otter)	Normal service (Twin Otter)
Single event	Normal service (Twin Otter)	Enhanced service (Saab 340B)
Dual event	No service (Twin Otter)	Enhanced service (Saab 340B)

2.4.3 Expanded Twin Otter operation (two Twin Otters)

The suggestion that two new Twin Otters will open up opportunities to serve another "high performance route", e.g. Skye, fails to take account of the need for fleet redundancy. In fact the level of redundancy provided by two Twin Otters on two "high performance routes" would be significantly worse than today's standard, although it would be better than the standard available when Loganair operated a single Twin Otter.

The expanded operation would be able to accommodate a single event (scheduled or unscheduled loss of one Twin Otter) only by operating some form of reduced service to both destinations. Clearly if a dual event (scheduled or unscheduled loss of both Twin Otters) occurred then there would be no service but there would be twice the number of disgruntled passengers as the current operation.

	Barra	Skye	Campbeltown /Tiree
Scheduled operation	Normal service (Twin Otter)	Normal service (Twin Otter)	Normal service (Saab 340B)
Single event	Reduced service (Twin Otter)	Reduced service (Twin Otter)	Normal service (Saab 340B)
Dual event	No service (Twin Otter)	No service (Twin Otter)	Normal service (Saab 340B)

Without the availability of the Twin Otter to operate the Campbeltown/Tiree services Loganair would probably elect to operate them all year round at higher cost with Saab 340Bs. Another operator of "conventional performance" 19 seater aircraft would then be in a strong position to offer a cheaper alternative. Such a scenario would destroy the fleet redundancy benefits of packaging the Barra and Campbeltown/Tiree services for short term economic gain on the Campbeltown/Tiree services.

2.4.4 Expanded Twin Otter operation (three Twin Otters)

In order to provide a reasonable level of service (i.e. not worse than today's service standard) a fleet of three Twin Otters will be required. One way to achieve this would be to retain one of the existing Twin Otter 310s although for commonality reasons a third Twin Otter 400 would be preferred.

	Barra	**Skye**	**Campbeltown /Tiree**
Scheduled operation	Normal service (Twin Otter)	Normal service (Twin Otter)	Normal service (Twin Otter)
Single event	Normal service (Twin Otter)	Normal service (Twin Otter)	Enhanced service (Saab 340B)
Dual event	Reduced service (Twin Otter)	Reduced service (Twin Otter)	Enhanced service (Saab 340B)

2.4.5 Summary

The simple conclusions are that:

- Packaging the Barra services with the Campbeltown/Tiree services was a practical solution to the problem of providing fleet redundancy.
- In order to operate two Twin Otters on scheduled services that require their unique performance capability any operator is going to need access to either a third Twin Otter or be willing to accept severe service disruption in the event of an unscheduled failure and reduced service during scheduled maintenance downtime.
- Even with a third aircraft it would be beneficial if this was operated on a service that could be operated with "conventional performance" aircraft when required (i.e. in the same way that the Barra and Campbeltown/Tiree services are packaged today).

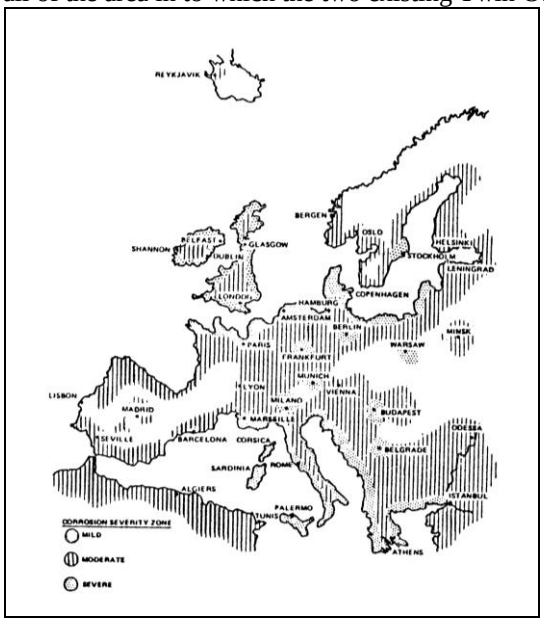
3.0 CORROSION

3.1 Background

All aircraft suffer from corrosion which is why they are subject to regular inspection (see Section 4.3). The resistance of aircraft to corrosion is highly dependent upon the environment in which the aircraft is operated and unfortunately the two Loganair Twin Otters are operated in one of the world's worst environments for corrosion.

3.2 Scotland

Scotland itself is fundamentally a poor environment for aircraft to operate in to. The chart below was taken from the Federal Aviation Administrations Advisory Circular AC43-4A "Corrosion Control for Aircraft". It highlights corrosion severity as either mild, moderate or severe. Fundamentally the areas closest to the sea are generally the worst hit and all of the area in to which the two existing Twin Otters are operated is severe.



3.3 Barra

Even more significantly the two existing aircraft both regularly operate on to the beach airstrip at Barra. This has to be one of the world's most challenging environments for an aircraft to operate in to. Scotland is already severely impacted by the nature of the salt water atmosphere but at Barra the aircraft comes in to direct contact with sea water itself. As well as the long term effects of corrosion this also results in a sand blast effect on the underside of the aircraft as the aircraft lands and is sprayed by the sand laden water.

3.4 Additional maintenance

Corrosion prevention and control requires a constant cycle of cleaning, inspection and lubrication. For more typical operators the emphasis is probably on inspection and the subsequent detection and removal of corrosion to limit the extent of the damage to the aircraft. In the case of the Scottish Twin Otters there is arguably more emphasis on cleaning and lubrication.

3.4.1 Airframe wash

Of all the aircraft in the Loganair fleet, the 16 Saab 340s, six Dornier 328s, two Islanders and the two Twin Otters, only the Twin Otter operating the Barra services is required to undertake daily washing. This is a high volume low pressure wash which takes considerable time and engineering manhours. As well as the washing care must be taken to remove the sand which "gets everywhere".

3.4.2 Engine wash

As well as the airframe the engines are subject to a daily compressor desalination wash whereby water is injected in to the engine intake. Every week a more comprehensive wash is undertaken which includes a compressor turbine desalination wash whereby water is injected through a wash tube inserted through one of the ignitor ports.

3.4.3 Lubrication

Constant washing removes the protective lubrication and therefore additional engineering manhours are required for lubrication. This is usually performed as part of the routine inspection carried out over the weekend.

3.4.4 Nose landing gear

The requirement for additional maintenance that results from the Twin Otter operation in to Barra's beach landing strip was highlighted by an accident that occurred to one of Loganair's Twin Otters. On the 22nd March 2007 Twin Otter G-BZFP suffered a landing gear collapse while taxiing at Glasgow Airport. The synopsis of the report by the Air Accidents Investigation Branch (AAIB) was as follows:

> *Whilst taxiing after landing, the lower section of the nose landing gear, including the wheel, detached from the nose leg. This resulted from corrosion damage to the screw threads of a lock nut used to secure the wheel fork to the lower extremity of the sliding element of the oleo strut. As a result of this incident, the operator has reviewed and amended their maintenance practices for the nose landing gear on the DHC-6.*

Loganair subsequently revised its maintenance procedures as follows:

1. In light of the company's frequent operation of the Twin Otter from beach landing strips:

a. The aircraft's maintenance program has been amended to include disassembly and inspection of the shock strut piston tube and locknut assembly, to check for corrosion, as part of the annual inspection.
c. The interval between inspections of the torque links has been reduced from 2,400 hours to 200 hours.

This demonstrates what can happen and how the Twin Otter operating at Barra requires more frequent inspection compared with a typical Twin Otter operation.

3.4.5 Experience
When considering alternative operators to Loganair care must be taken to ensure that any new or less experienced Twin Otter operator is taking adequate account of the higher costs that result from operating in the harsh environment of Barra.

The Scottish Government has already witnessed the damage that can be caused to aircraft flying in Scotland's corrosive environment. In 2008/2009 the two Marine Scotland owned and Highland Airways operated Reims F406 aircraft were replaced by two new build examples. Subsequent to their return to Marine Scotland the two older aircraft were found to be suffering from extensive corrosion damage.

3.5 Premature ageing

3.5.1 Corrosion resistance
The primary benefit of maintaining new build aircraft is that while the manhours required to perform the scheduled inspections themselves should be essentially similar the inspections should reveal less in the way of defect rectification. To put this in to perspective for a new aircraft there might be little if any defect rectification in the early years of operation. However for older aircraft the ratio of manhours spent on defect rectification resulting from corrosion inspections compared to the inspection manhours alone can be quite high but also highly variable. Detailed data from one operator (which had corrosion inspections performed on eight of its aircraft by the same maintenance centre within the space of eighteen months) highlighted a ratio of rectification manhours to inspection manhours varying between 1.60:1 and 6.40:1. i.e. for every inspection man hour up to 6.40 manhours were spent rectifying defects.

In general the early years of operation of a new aircraft in a benign environment will be relatively corrosion free but the process of escalating defect rectification will accelerate as time moves on. More importantly the process of escalation will move far faster where an aircraft has been operated in a high corrosion environment.

The nearest equivalent to the Barra operations are those of Twin Otter seaplane operators. One of these is Seaborne Airlines of the US Virgin Islands which is also rare as an example of an operator of Twin Otters in both seaplane and landplane configuration. In their operation a seaplane must undergo a major overhaul every three years at a cost of US$1.50 million. In comparison their landplanes operate to a ten year cycle between major overhauls. They have investigated the new Twin Otter 400 but have concluded that they are better served by used examples. "*The (new) aircraft get used up faster than you get money out of them. Once an airplane starts being exposed to salt water, the clock starts ticking*".

3.5.2 Avionics
As stated in Section 2.3.3 the introduction of new Twin Otter 400 aircraft should have a positive impact on unscheduled maintenance downtime. With all new components, wiring, etc. the number of unscheduled failures in the early "honeymoon" period will hopefully be greatly reduced compared with the two existing Loganair Twin Otter 300s (both of which were manufactured in 1980).

One concern however is the new Honeywell Primus Apex integrated avionics. These are reported to be at least four times more reliable than the older generation electromechanical systems used on

the previous Twin Otter generation. By replacing a large number of separate instruments and replacing them with fewer boxes there are fewer connections giving fewer opportunities for corrosion. However the fact remains that there is some concern that modern digital avionics are less able to cope with damp climates. Given the uniquely "damp" operating environment of the Barra beach landing strip it is not inconceivable that the Twin Otter 400s will suffer reliability issues related to the new avionics. The only way that this concern will be resolved is by in-service experience.

3.6 Summary

- Scotland and Barra in particular provide one of the world's worst environments for aircraft.
- Operating in to Barra adds a substantial burden of additional washing and lubrication to the existing maintenance schedule for the aircraft.
- Loganair has been required to modify its Twin Otter maintenance program in order to cope with the additional damage that results from regular operations in to the Barra beach landing strip.
- Even with the additional maintenance a new Twin Otter 400 will age prematurely in the harsh environment of Scotland and Barra beach in particular.

4.0 MAINTENANCE

4.1 Line maintenance

There is variation between operators but a typical line check programme would be:

Pre-flight inspection	Prior to each flight (carried out by the flight crew)*
Service Inspection	Every two days**
Routine Inspection	Every week

* Some operators, particularly those operating to remote areas, have obtained approval for their flight crews to perform the Service and Routine Inspections as well as the pre-flight checks but this is unlikely to be accepted by the UK CAA.

** A daily Service Inspection interval is considered essential for the Loganair operation.

- Increasing the utilisation of the aircraft will <u>not</u> impact the frequency of the daily Service Inspections or the weekly Routine Inspections since they are based on calendar intervals.
- A new Twin Otter 400 will not significantly reduce the amount of maintenance required to carry out the daily Service Inspections and weekend Routine Inspections and washing tasks compared with the older Twin Otter 300s.

4.2 EMMA inspections

<u>4.2.1 Background</u>

The Twin Otter is maintained according to the Equalized Maintenance for Maximum Availability (EMMA) inspection system. This consists of 48 checks of 125 flight hours each, for a complete cycle of 6,000 flight hours. Each numbered check, from 1 to 48, lists the required inspection to be carried out. In this system, a number of individual work cards are specified for every 125 hour inspection, each addressing a separate area of inspection on the aircraft.

Based on their own operational experience some operators have modified the EMMA inspection with either fewer checks and/or longer intervals. Loganair has been able to extend its EMMA interval to 200FH but a new operator of the type would almost certainly be limited to the basic 125FH interval.

<u>4.2.2 Downtime</u>

In order to avoid the aircraft being unavailable during the week the EMMA checks have to be performed over the weekend. The manhours required to perform the EMMA are estimated at 120 manhours which equates to approximately 16 man days or eight men working single shifts over the two day weekend. This is an intensive workload on such a small aircraft.

At a annual utilisation of 1,500FH and an EMMA interval of 200FH Loganair are required to perform an EMMA check approximately every six weeks. With a two aircraft fleet this means that

one aircraft is undergoing an EMMA every three weeks. A new operator of the type limited to an EMMA interval of 125FH will be required to perform an EMMA check approximately every four weeks. With a two aircraft fleet this means that one aircraft is undergoing an EMMA every two weeks. The manhours required to perform the inspection may be less due to the more frequent inspections but this benefit may be largely offset by the new operators lack of experience on the type.

- Increasing the utilisation of the aircraft will increase the frequency of the EMMA checks and therefore the workload during the weekends when these take place.
- A new Twin Otter 400 should benefit from reduced defect rectification arising from the EMMA checks compared with the older Twin Otter 300s. However this will not increase the availability of the aircraft since these are generally carried out at weekends.

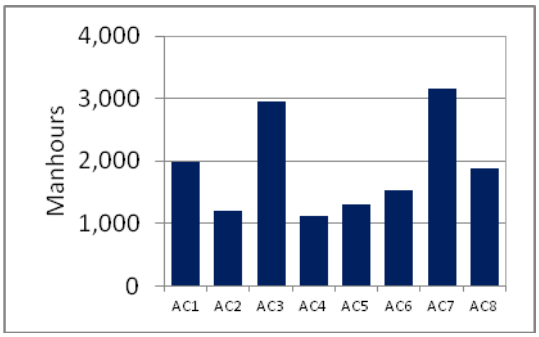
4.3 Corrosion inspections

4.3.1 Background

In 1994 Airworthiness Directive CF-94-12R1 was issued which required all Corrosion Tasks (CTs) to be performed in one visit. In 1999 AD CF-99-11 was issued which required the CTs to be performed on a repetitive basis and provided the option of performing the CTs during several maintenance visits in one year or a specific group of CTs on an annual basis over a five year period. Most operators elected to carry out annual inspections.

4.3.2 Downtime

Detailed data from one operator has highlighted the variability of this particular aspect of Twin Otter maintenance. This operator had corrosion inspections on eight of its aircraft performed by the same maintenance centre within the space of eighteen months. The average number of manhours to accomplish the inspection was approximately 1,900 but the amount varied between 1,100 manhours to 3,200 manhours.



- Increasing the utilisation of the aircraft will not impact the frequency of the Corrosion Inspections since they are based on calendar intervals.
- A new Twin Otter 400 will initially benefit from much lower maintenance relative to the current annual corrosion inspections on the Twin Otter 300. These will not be required immediately and when they are the amount of defect rectification required should be substantially less, at least in the early years. More importantly it will reduce the downtime of the aircraft.

4.4 Summary

- Discounting many out of phase tasks which are undertaken when required, the maintenance of the Twin Otter essentially boils down to:
  - Daily Service Inspections and washing (of the Barra aircraft)
  - Weekend Routine Inspection and more extensive washing of the engines in particular
  - Weekend EMMA checks when due
  - Annual corrosion checks
- Increasing the utilisation of the aircraft will not impact the frequency of the daily Service Inspections or weekly Routine Inspections since these are based on calendar intervals.
- A new Twin Otter 400 will not significantly reduce the amount of maintenance required to carry out the daily Service Inspections and weekend Routine Inspections and washing tasks compared with the older Twin Otter 300s.

- Increasing the utilisation of the aircraft will increase the frequency of the EMMA checks and therefore the workload during the weekends when these take place.
- A new Twin Otter 400 should benefit from reduced defect rectification arising from the EMMA checks compared with the older Twin Otter 300s. However this will not increase the availability of the aircraft since these are generally carried out at weekends.
- Increasing the utilisation of the aircraft will not impact the frequency of the Corrosion Inspections since they are based on calendar intervals.
- A new Twin Otter 400 will initially benefit from much lower maintenance relative to the current annual corrosion inspections on the Twin Otter 300. These will not be required immediately and when they are the amount of defect rectification required should be substantially less, at least in the early years. More importantly it will reduce the downtime of the aircraft.

5.0 MAINTENANCE COST

5.1 Budgetary cost estimates

A survey of the maintenance costs of the Twin Otter 300 has been undertaken with various operators. This has concluded that at a typical annual utilisation of 1,500FH/2,500FC the annual maintenance cost of the Twin Otter 300 will be US$1,098,025 (equivalent to US$732/FH or GBP472/FH).

	Twin Otter 300		Twin Otter 400		Comment
	Cost	Annual cost	Cost	Annual cost	
Service	$4,867/mth	$58,400	$4,867/mth	$58,400	See Note 5.1.1
Washing	$7,300/mth	$87,600	$7,300/mth	$87,600	Unchanged
Routine	$3,467/mth	$41,600	$3,467/mth	$41,600	See Note 5.1.1
EMMA	$76.80/FH	$115,200	$38.40/FH	$57,600	See Note 5.1.2
Corrosion	$5,000/mth	$60,000	$2,500/mth	$30,000	See Note 5.1.3
Consumables	$125/FH	$187,500	$62.50/FH	$93,750	See Note 5.1.4
Rotables	$75/FH	$112,500	$75/FH	$112,500	See Note 5.1.5
Landing gear	$11.43/FC	$28,575	$11.43/FC	$28,575	Unchanged
Propellers	$10.00/FH	$15,000	$10.00/FH	$15,000	Unchanged
Engines	$211.10/FH	$316,650	$190.00/FH	$285,000	See Note 5.1.6
	$30/FC	$75,000	$30/FC	$75,000	
TOTAL	$497.90/FH	$1,098,025	$375.90/FH	$885,025	
	$41.43/FC		$41.43/FC		
	+$20,634/mth		+$18,134/mth		

The comparable annual maintenance cost for the Twin Otter 400 has been estimated as US$885,025 (equivalent to US$590/FH or GBP381/FH). This estimate is based on the Twin Otter 300 survey modified as detailed in the notes below:

5.1.1 Service and Routine Inspections

Engineers have to be available to carry out these inspections whether it is a Twin Otter 300 or a Twin Otter 400. The daily Service Inspection contains visual walk around inspections and servicing (e.g. engine oil checks). The weekly Routine Inspection contains more in depth servicing and inspections requiring panel removal/lowering. The biggest element of Loganair's Routine Inspection relates to the washing and lubrication of the aircraft operating to Barra. Since all of the tasks need to be carried out and have little to do with possible defects there is little opportunity for savings with a new aircraft.

5.1.2 EMMA inspections

The maintenance cost analysis determined that the labour required to carry out an EMMA inspection was of the order of 120 manhours. The introduction of new Twin Otter 400 aircraft should provide some reduction on this since all the systems will be new, devoid of wear, corrosion, etc. But over time this advantage will be lost and given the operating environment it will probably not take very long. For the purposes of this analysis it is assumed that the average inspection manhours for the Twin Otter 400 will be 50% of those for the mature Twin Otter 300 for the first ten to 15 years of operation. Over the lifetime of the Twin Otter 400 this advantage will be lost.

5.1.3 Corrosion inspections

The maintenance cost analysis determined that the labour required to carry out an annual corrosion inspection was between 375-750 manhours with an average around 500 manhours. This applied to a landplane operating in a non-corrosive environment. It is assumed that the higher rate, i.e. 750 manhours would be more applicable for the environment considered here. For the purposes of this analysis it is assumed that the average inspection manhours for the Twin Otter 400 will be 50% of those for the mature Twin Otter 300 for the first ten to 15 years of operation. Over the lifetime of the Twin Otter 400 this advantage will be lost.

5.1.4 Consumables

The maintenance cost analysis determined that a typical allowance for consumables is US$125/FH. Since the Twin Otter 400 will benefit from all new components, structure, etc. the consumables estimate for the Twin Otter 400 is assumed to be 50% of that for the Twin Otter 300.

5.1.5 Rotables

With the exception of the avionics many of the rotable components installed on the Twin Otter will be little different from those on the older generation Twin Otter 300. The primary benefit of the Twin Otter 400 is that all these components will be new and covered by warranty. However this warranty effect will be "used up" during the term of the first PSO contract and subsequent operators will gain no further benefit.

Apart from warranty the biggest potential cost savings will come from the new generation avionics but as discussed in Section 3.5.2 there is some concern about how well modern digital avionics will cope with the "damp" operating environment of Barra and it is therefore somewhat early to attribute cost savings in this area. In fact while the new avionics system massively reduces the number of instruments, and under normal conditions have far higher mean time between failures, when they do fail the cost of repair can be very high. The mature cost for the Twin Otter 400 is therefore assumed to be unchanged from the existing Twin Otter 300.

5.1.6 Engines

The hourly maintenance cost for the engines is driven by the engine Time Between Overhaul (TBO). The basic TBO for the Twin Otter 300s PT6A-27 engines (as published by Pratt & Whitney Canada) is 3,600 hours but individual operators are able to extend the TBO based on in service experience. There figures quoted here are intended to reflect a new operator operating to the 3,600 hour TBO and carrying out a mid-life Hot Section Inspection at 1,800 hours.

The Twin Otter 400 is powered by the PT6A-34 engine which has a higher thermodynamic power than the PT6A-27 but which is operated at the same mechanical power output for the Twin Otter application. Since it is operating with much better temperature margins the overhaul cost of the PT6A-34 should be lower than the PT6A-27. However because there are far more -27s on the market there are a lot of used but serviceable components available which keeps the PT6A-27 overhaul cost down. In comparison the PT6A-34 is a comparatively rare engine and therefore the availability of serviceable components is limited.

The basic TBO of the PT6A-34 is 4,000 hours and the HSI interval is 2,000 hours. For the purposes of this analysis the overhaul costs of the two engines are assumed to be the same but the PT6A-34 is given the credit for the higher TBO. The first overhaul of the PT6A-34 will be comparatively cheap and the mature cost will not be reached until probably the third overhaul. Since this benefit will be exhausted after 8,000 hours or approximately five years of operation it has not been included further in this analysis.

5.2 Twin Otter 400 savings

5.2.1 Twin Otter lease rates

To put the maintenance cost saving in to perspective it is necessary to understand the overall cost benefit of the Twin Otter 400. The major cost drivers are the aircraft lease rate, maintenance, crew, fuel and en-route and airport charges. Since the Twin Otter is essentially identical to the Twin Otter 300 the crew, fuel, en-route and airport charges are going to be unchanged. The only areas that will be different are the aircraft lease rate and the maintenance costs.

5.2.2 Twin Otter lease rates

Availability of Twin Otter 300s for either purchase or lease is quite limited and the only aircraft currently advertised for lease on the internet has a lease rate of US$31,000. Two existing operators, one in Europe and one in the Caribbean are currently paying lease rates for the Twin Otter 300 of US$28,000 and US$30-32,000 respectively. For the purposes of this analysis the current market lease rate for the Twin Otter 300 is assumed to be US$30,000 per month.

Commercially available lease rates for the Twin Otter 400, based upon a purchase price of US$7.00 million, are unlikely to be substantially less than US$60,000 per month unless a lessor was willing to make very aggressive assumptions about the aircraft's residual value.

However if the Scottish Government was willing to structure a 25 year lease based solely on a cost of funds of 3.25% (nominal current 25 year swap rate) combined with a residual value assumption after 25 years of 40% it would be able to achieve a lease rate of approximately US$28,000 per month. However it is stressed that a lease rate calculated in this way is not one that would be available from a commercial organisation. It is only included since the cost to the operator of the aircraft will in turn be reflected in the subsidy required for the operation and therefore this might be an appropriate direction to go.

Under normal commercial circumstances the additional lease cost of the Twin Otter 400 is therefore likely to amount to US$30,000 per month (assuming a lease cost of US$30,000 for the Twin Otter 300 and US$60,000 per month for the Twin Otter 400). Over a year this amounts to US$360,000 which at an annual utilisation of 1,500FH equates to US$240/FH. In other words the Twin Otter 400 has to save US$240/FH from maintenance costs in order to offset the higher lease cost of the aircraft.

5.2.3 Potential Twin Otter 400 maintenance cost savings

The majority of the maintenance costs for the Twin Otter 300 and 400 are unchanged, i.e. Service Inspections, washing, Routine Inspections, rotables, landing gear and propellers. The cost of the PT6A-27 and -34 engines are well understood which means that a saving of only US$20/FH is achievable from the engines. This means that any remaining savings have to come from the EMMA checks, Corrosion Inspections and consumables. The total estimated cost per hour of these three items on the Twin Otter 300 is only US$242/FH! Therefore the cost of these three areas would have to be reduced by 90% to offset the higher lease cost.

5.3 Summary

- A survey of the maintenance costs of the Twin Otter 300 has concluded that at a typical annual utilisation of 1,500FH/2,500FC the maintenance cost will be of the order of US$732/FH (GBP472/FH).
- The equivalent cost estimate for a new Twin Otter 400 aircraft is of the order of US$590/FH (GBP381/FH). However the costs of the Twin Otter 400 will rapidly rise to similar levels to the existing Twin Otter 300s as the aircraft suffers from the premature ageing effect of operating in to Barra.

6.0 OTHER MAINTENANCE CONSIDERATIONS

6.1 Age

The first Twin Otter made its maiden flight back in 1965 and production continued until 1989 when the last of a total of 844 original Twin Otter 100, 200 and 300 series aircraft was delivered. Of these approximately 600 remain in operation and obtaining a Twin Otter of any age or condition is very difficult with high demand and limited availability. A good demonstration of the longevity of the type is provided by the histories of the early production aircraft. The current status of the first ten Twin Otters produced is tabled below.

S/n	First flight	Status	Operator	Comment
1	20/05/65	WFU	n/a	Displayed at the Canada Aviation and Space Museum, Ottowa
2	06/06/66	WFU	n/a	Displayed at the Aero Space Museum, Calgary
3	--/09/65	Current	Peruvian Coast Guard	-
4	13/04/66	Current	NASA	-
5	07/04/66	w/o	n/a	Take-off accident 1973
6	25/07/66	w/o	n/a	Accident 1970
7	10/08/66	w/o	n/a	Accident 1998
8	23/08/66	w/o	n/a	Take-off accident 2009
9	27/08/66	Current	Ikhana Group	-
10	23/09/66	Current	Fuerza Aerea de Chile	-

The first aircraft, s/n 1 was finally withdrawn from use in 1981 and the second, s/n 2, in 1997. The next two aircraft both remain in service, s/n 3 with the Peruvian Coast Guard and s/n 4 with NASA. The next four aircraft have all been written off in accidents but s/n 9 and 10 are both still in operation.

Since leaving the factory many Twin Otters will have been practically rebuilt with new wings, new engines, avionics, propellers, etc. and the major components have been overhauled several times over. The demand for the type has resulted in substantially damaged airframes being completely rebuilt. It is often claimed that provided you can obtain the data plate for a Twin Otter you can rebuild them!

Although this is slightly exaggerated there is no reason why the Twin Otter cannot go on almost indefinitely (subject to the fatigue life limitations detailed in Sections 6.2 and 6.3). Based upon the experience of the ten first production Twin Otters a life of 50 years is not unrealistic.

6.2 Fatigue life of wing box

6.2.1 Background

The Twin Otter 300/400 wing box has a fatigue life of 33,000 hours/66,000 cycles. At a utilisation of approximately 1,500 hours/2,500 cycles per year the fatigue life of the Twin Otter wing box will have been consumed within 22 years. At this point the aircraft will still have a future ahead of it but it will require an expensive wing modification after which the aircraft will be good for at least another 22 years. There are three methods of wing life extension as detailed below.

6.2.2 New wing box

The traditional procedure has been for Twin Otter operators to purchase new wing boxes, stripping the run-out wings of all components such as flight controls, engine nacelles, etc. then re-installing these components, if serviceable, on the new wing boxes. This process may be accomplished only once and is the most expensive option. Once replaced the wing is good for another 33,000 hours/66,000 cycles.

6.2.3 RW Martin (now Ikhana Aircraft Services) Re-Life Wing Box

This Supplemental Type Certificate replaces all the fatigue-critical components on the run-out wings and adds further structural reinforcement at which point the run-out wing becomes zero timed and is good for 45,000 hours/90,000 cycles. It is cheaper than a new replacement wing box and adds more life. It can be applied to the Twin Otter 100, 200 and 300 and can be combined with increased design weights on the Twin Otter 200.

6.2.4 Structural Integrity Engineering Wing Life Extension Program

This Supplemental Type Certificate effectively makes the wing "on-condition". After a detailed inspection and the incorporation of a limited number of modifications the continued integrity of the wing is ensured by performing regular inspections (every 1,000 flight hours or 1,500 cycles) of the fatigue critical wing structure using eddy current and ultra sonic inspection techniques. This is the cheapest of the three options but has the disadvantage of requiring continual inspection and is only applicable to the Twin Otter 300.

6.3 Fatigue life of fuselage

The Twin Otter 300/400 fuselage has a fatigue life of 66,000 hours/132,000 cycles. In November 2011 RW Martin (now Ikhana Aircraft Services) received approval for its "Re-Life Fuselage" modification. This works just the same as the company's Re-Life Wing Box modification in that all the fatigue critical components are replaced after which time the fuselage becomes zero timed and is good for another 66,000 hours/132,000 cycles. At a utilisation of approximately 1,500 hours/2,500 cycles per year the fatigue life of a new production Twin Otter 400 fuselage box will not be consumed until 44 years have elapsed.

6.4 Summary

- Since leaving the factory many Twin Otters will have been practically rebuilt with new wings, new engines, avionics, propellers, etc. and the major components have been overhauled several times over.
- There is no reason why the Twin Otter cannot go on almost indefinitely (subject to the fatigue life limitations detailed in Sections 6.2 and 6.3). Based upon the experience of the ten first production Twin Otters a life of 50 years is not unreasonable.

- The Twin Otter 300/400 wing box has a fatigue life of 33,000 hours/66,000 cycles. At a utilisation of approximately 1,500 hours/2,500 cycles per year the fatigue life of the Twin Otter wing box will have been consumed within 22 years. At this point the aircraft will still have a future ahead of it but it will require an expensive wing modification after which the aircraft will be good for at least another 22 years.
- The Twin Otter 300/400 fuselage has a fatigue life of 66,000 hours/132,000 cycles. At a utilisation of approximately 1,500 hours/2,500 cycles per year the fatigue life of a new production Twin Otter 400 fuselage box will not be consumed until 44 years have elapsed.
- If the Twin Otter operation is expanded to incorporate more services by increasing the utilisation of the aircraft then its fatigue life will be consumed more quickly and the expense of modification or replacing the wing box will need to be considered long with the downtime for the modification.

7.0 LOGANAIR ADVANTAGES

7.1 Background

Loganair has been operating the Glasgow to Barra service since October 1974, initially with Britten-Norman Trislanders and then from 1981 with Twin Otters. For a brief period between March and November 1994 the service was operated by the Shorts 360 but the poor reliability of the service resulted in the return of the Twin Otter. Since Loganair took over the Barra services no other operator has come forward to offer any serious alternative.

7.2 Aircraft

7.2.1 Existing Twin Otter 300s

The two existing Twin Otters are leased to Loganair under operating leases which have been extended continuously in parallel with the PSO contracts. The availability of Twin Otters remains extremely limited and the ability to continue to lease the existing aircraft is a significant advantage to Loganair.

Since Loganair does not own the aircraft there is always the risk that the owner will decide to lease the aircraft elsewhere at the end of the current lease contract. The continued speculation that the Scottish Government is going to order new Twin Otter 400s to replace them only increases the likelihood of this happening.

7.2.2 Spare capacity

As detailed in Section 2.1.3 Loganair is able to substitute one of its Twin Otters with a locally based Saab 340B when necessary. Smaller operators without an extensive local operation will probably not have access to the same level of spare capacity.

7.3 Personnel – Flight crew

In the event that the PSO contracts were awarded to a new operator the existing Twin Otter flight crew could be transferred with them under TUPE (Transfer of Undertakings Protection of Employment) regulations. However there is no guarantee that all of the individuals concerned would want to leave Loganair. Unlike many operators who progress their pilots according to aircraft size Loganair tends to crew the Twin Otters with its more experienced pilots and therefore many of the Twin Otter pilots will already be experienced and type rated on the Saab 340B. Some may want to remain on the Twin Otter but others will probably prefer to remain at Loganair and convert back to the Saab 340B.

7.4 Personnel - Engineers

The same situation will exist with engineers. Since they will generally be experienced on both the Twin Otter and the Saab 340B there is even less likelihood of them wanting to transfer with the aircraft.

7.5 Maintenance capability

As detailed in Section 2.2.2 the number of UK maintenance facilities that are approved for the Twin Otter is very limited. In addition the fact that the Loganair facility is located at the main base of operations for the Twin Otter is a major advantage, see Section 2.2.3.

In the event that the contract to operate the Twin Otters was awarded to another operator it would be beneficial if Loganair were willing to offer their maintenance services to the new operator. Clearly this would need to be on a for profit basis. In addition to cost considerations it is unlikely that the aircraft would receive the same level of priority that they currently do.

7.6 Maintenance cost

7.6.1 EMMA inspections

Based on their long experience with the type Loganair have been able to extend the EMMA inspection interval from 125FH to 200FH. A new Twin Otter operator would have to start at the 125FH interval. As well as the cost impact it means that Loganair only has to ground the aircraft once every six weeks compared with once every four weeks for the new operator.

7.6.2 Engine costs

Engine costs are driven by the time between overhauls or TBO. This is set by the manufacturer at 3,600 hours (for the Twin Otter 300s PT6A-27 engines) but an operator can escalate this based on their own service experience. The escalation comes in 500 hour increments and takes many years since it is based on findings from successive overhauls. In the decades that they have been operating Twin Otters Loganair have been able to extend the time between overhauls on their PT6A-27 engines from 3,600 hours to 9,500 hours. A new operator of the Twin Otter would have to start at the basic TBO of 3,600 hours and it will take decades to achieve the Loganair interval.

7.7 Performance standards

In order to meet the latest EU-OPS standards for calculating airfield performance Loganair were forced to carry out a series of test flights at Barra to establish Twin Otter 300 performance standards. This data remains the intellectual property of Loganair and without it any new operator to Barra would be required to carry out his own test flight programme.

In order to carry out the testing the new operator would need an aircraft on which to carry out the testing. The aircraft would also need to be made available well in advance of the new contract start date since in all likelihood it will take many months for the UK CAA/EASA to approve the data. It is recommended that the Scottish Government carries out its own testing with the Twin Otter 400 once the first new aircraft becomes available. Alternatively it could attempt to purchase the existing data from Loganair since it is assumed that this data will apply equally to the new Twin Otter 400. Apart from cost issues there may also be potential liability issues.

7.8 Spares

7.8.1 Investment in spares

Manufacturers will produce an Initial Provision list of spares that it recommends an operator should have on his shelves to support his aircraft. These are often very extensive lists requiring a large investment in components that may never be used and therefore many operators tend to scale these down. The degree of investment in spares is a function of the desired protection level and fleet size. Larger fleets require less investment per aircraft.

7.8.2 Loganair's advantage

As with the other aircraft in its fleet Loganair has a stock of spare components to support the two existing Twin Otter 300 aircraft. Some of these will continue to be applicable to the Twin Otter 400. However there will be little commonality in two important areas, avionics and the powerplant. The avionic systems on the Twin Otter 400 are completely new and the engine is a different model to that used on the Twin Otter 300 (PT6A-34 versus PT6A-27). In order to support the Twin Otter 400s Loganair will have to invest in a new package of spares to cover the differences. Loganair's investment in spares to support the Twin Otter 400 will be substantially less than that required by a new operator of the type. The latter will have to invest his own capital in spares which he may later have to sell at a significant loss if he doesn't retain the contract next time around.

7.8.3 Solution

One solution to this problem would be for the aircraft to be leased complete with a spares stock that is purchased at the same time as the aircraft.

7.9 Summary

- The purchase of two Twin Otters by the Scottish Government opens up opportunities for other operators to bid for the Barra PSO. However several issues make it difficult for any new Twin Otter operator to put forward a credible alternative to Loganair.
- Unless serious consideration is given to how to overcome issues relating to personnel, maintenance, performance standards and spares it is likely that the Twin Otter operation to Barra will remain with Loganair as the only realistic option.

8.0 FLOATPLANE OPTIONS

8.1 Background

8.1.1 Introduction

As a possible alternative to investment in airport development at Skye this section of the report has taken a very brief look at the practicality of Twin Otter seaplane operations to both Skye and Barra.

8.1.2 Seaplane operations around the world

In parts of the USA (Alaska in particular) and Canada the seaplane continues in use as a regular mode of transportation. Scotland is equally suitable for seaplanes with more than 790 islands (only 120 populated) and over 30,000 freshwater lochs. One Scottish operator, Loch Lomond Seaplanes, operates two amphibians, a Cessna Caravan and a Cessna 208, on charter and sightseeing flights around the west coast.

Canada's Harbour Air operates the world's largest all-seaplane fleet with over 50 aircraft. The route network is extensive but the primary route connects Vancouver with Victoria on Vancouver Island, a distance of approximately 50nm. Two of the world's largest seaplane operators are in the Maldives, Maldivian Air Taxi and Trans Maldivian, which both offer connecting flights from the International Airport at Male to more than 40 resort islands. The majority of these are within an 80nm radius (some as short as 20nm but some are out as far as 170nm).

8.1.3 Twin Otter options

The Twin Otter 400 is offered with floats in either amphibian or seaplane configuration with the amphibian being heavier and more expensive. The floats are provided by American company Wipaire.

Due to the time required to undertake the conversion (at least half a day for two men) it would not be practical to keep changing the aircraft between landplane and seaplane configuration (some operators, particularly in Canada, swap between floats and wheels/skis on a seasonal basis, floats in summer and wheels/skis over the winter). Assuming that the destination airport will always be Glasgow Airport the seaplane is not an option and the amphibian will be required.

8.2 Cost penalties

The list price for the floats and rigging is US$593,500 for the amphibian and US$375,900 for the seaplane. The cost of installation is a further US$38,800 for the seaplane and US$49,400 for the amphibian.

8.3 Weight penalties

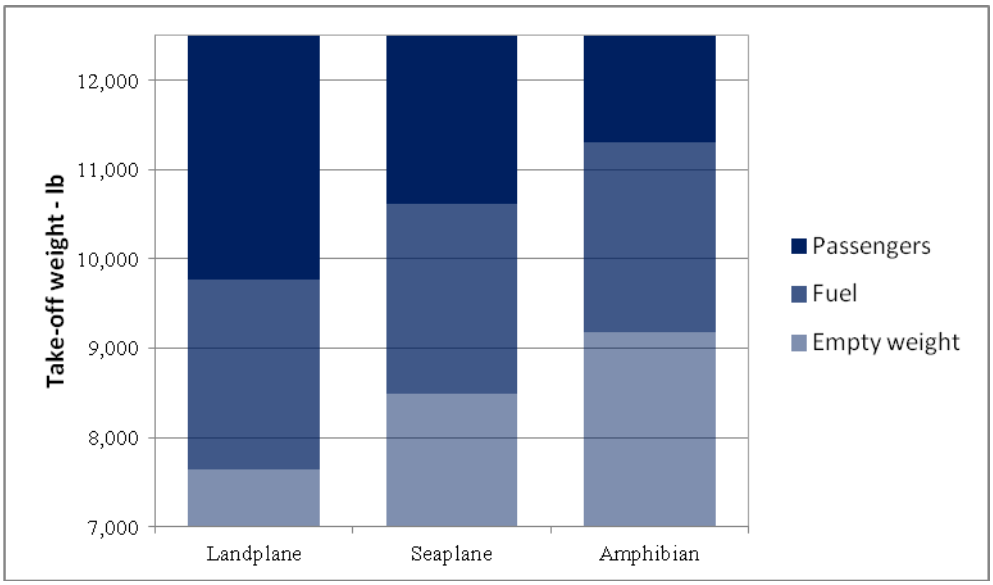
8.3.1 Weight impact of floats

The weight impact of the floats is 849lb for the seaplane configuration and 1,538lb for the amphibian.

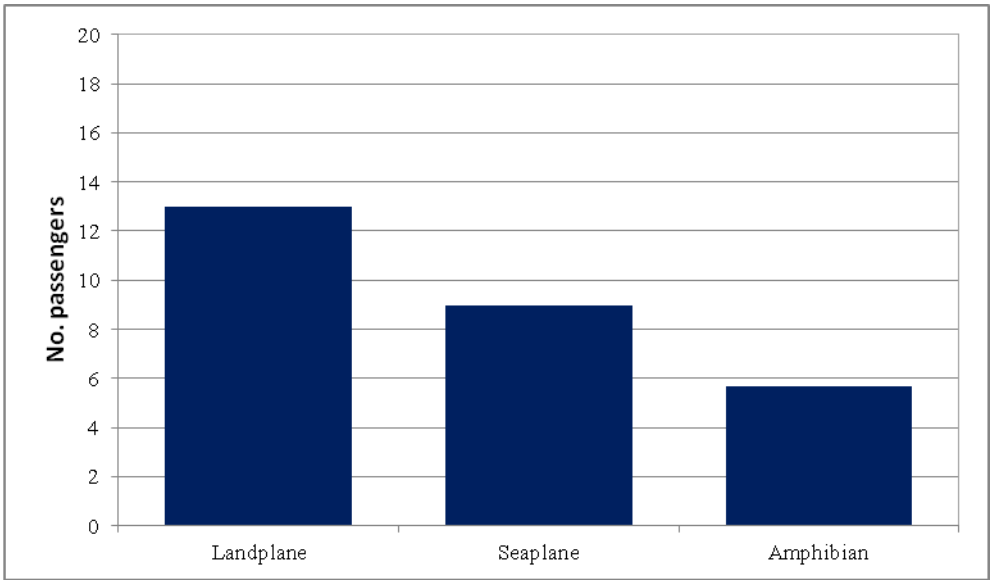
8.3.2 Impact on Barra operation

The Twin Otter landplane is already limited to 13 passengers outbound from Glasgow and 15 inbound from Barra as a result of the existing weight restrictions. These are exacerbated by the need to carry return fuel for the flight back to Glasgow since no option to refuel at Barra exists. Making fuel available at Barra would immediately increase the number of passengers but environmental concerns from the possibility of spillage would need to be overcome.

The weight impact of the floats is significant and the fact that the existing payload is limited by the Maximum Take-off Weight (MTOW) means that any increase in weight for the floats has to be offset by an even lower payload.



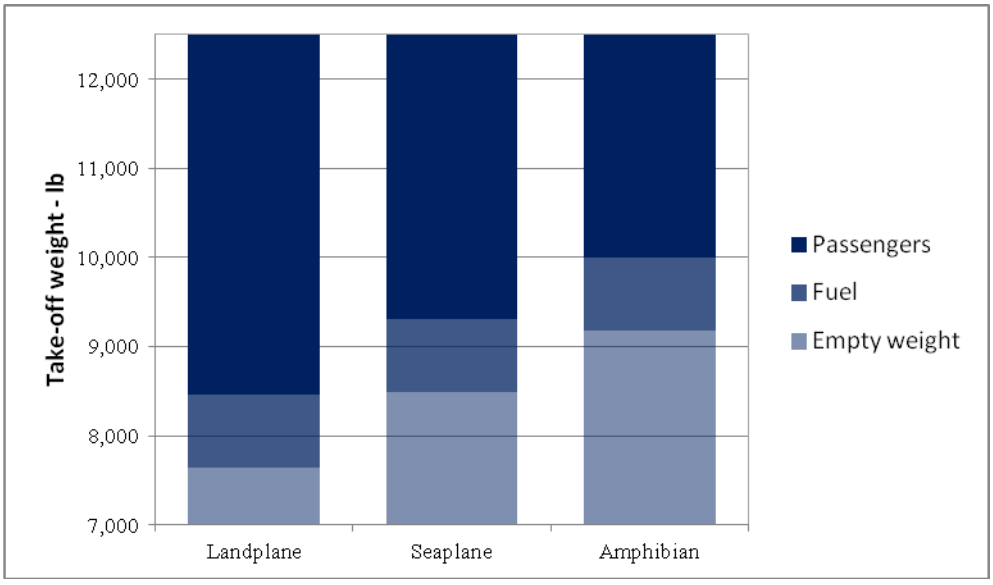
The weight impact of the floats reduces the passenger payload from the 13 passengers of the landplane to nine passengers for the seaplane and less than six for the amphibian.



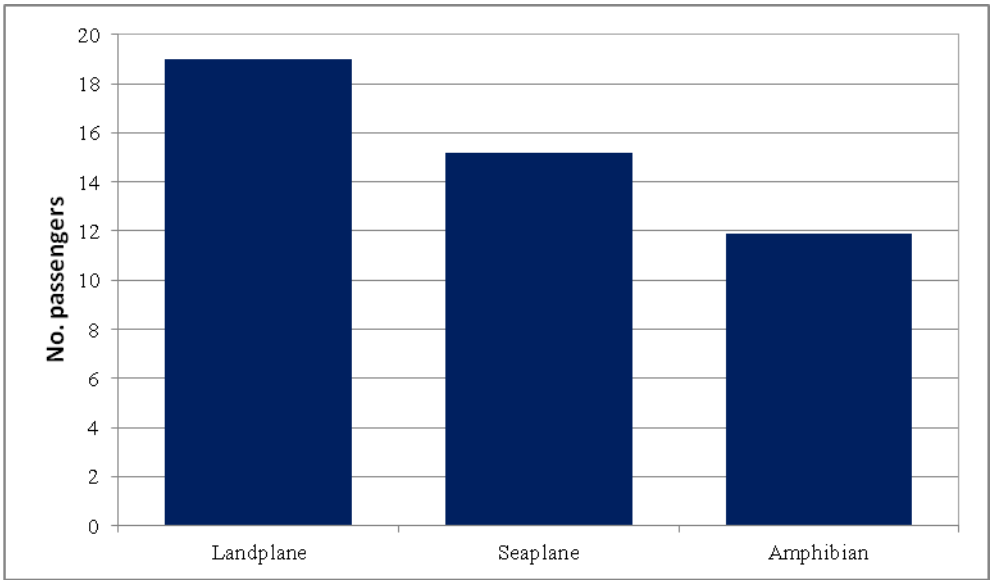
No account has been taken for the extra fuel consumptions that will result from the increased drag of the float equipped aircraft.

8.3.3 Skye operation

Skye benefits from being closer to Glasgow (95nm compared to 122nm) but more importantly it is assumed that fuel could be made more readily available at Skye and thus there would not be the need to carry return fuel. This assumption may be more realistic for the landplane operation than a seaplane option and the same requirement for return fuel may apply to Skye that exists for Barra. However for the purposes of the numbers that follow it is assumed that fuel will be available in Skye for the landplane, seaplane and amphibian options.



It is assumed that a Twin Otter landplane operating from Skye could manage a full 19 passenger payload. The weight impact of the floats reduces the passenger payload to 15 passengers for the seaplane and less than 12 for the amphibian.



8.4 Speed penalties

The in-flight performance of the Twin Otter seaplane is impacted by the additional weight and drag of the floats. The seaplane will be approximately 15 knots slower than the regular landplane increasing journey times by approximately 10%.

8.5 Summary

Although the Twin Otter is extensively used in floatplane operations these are commonly short range operations. In the case of the operations in Canada the distance of these flights is only 50nm and in the Maldives the majority of flights are less than 80nm. Overall because of the lower requirement for fuel the aircraft can operate with a full passenger payload.

In comparison the Twin Otter flight to Barra, over 120nm, requires almost half the available payload to be used for fuel. The Twin Otter seaplane/amphibian is simply not a viable option for Barra because the weight impact of the floats reduces the passenger payload from the 13 passengers of the landplane to nine passengers for the seaplane and less than six for the amphibian.

The Twin Otter seaplane/amphibian is more suitable for Skye where the seaplane is limited to 15 passengers and the amphibian to 12. Assuming that a direct connection with Glasgow Airport would be preferred then the amphibian will be required and its payload of 12 passengers compares unfavourably with the 19 passengers available with a landplane.

APPENDIX E

Oban-based Islander Timetable Elaborations

Current Inner Hebrides Timetable

Winter

MONDAY					TUESDAY					WEDNESDAY					THURSDAY				
FLT	STD	FROM	TO	SAT	FLT	STD	FROM	TO	STA	FLT	STD	FROM	TO	STA	FLT	STD	FROM	TO	STA
201	08:30	OBN	COL	09:00	301	08:30	OBN	CSA	09:00	201	08:30	OBN	COL	09:00	301	08:30	OBN	CSA	09:00
202	09:15	COL	TRE	09:30	302	09:15	CSA	ILY	09:40	202	09:15	COL	TRE	09:30	302	09:15	CSA	ILY	09:40
203	09:45	TRE	OBN	10:20	303	09:55	ILY	OBN	10:35	203	09:45	TRE	OBN	10:20	303	09:55	ILY	OBN	10:35
204	14:00	OBN	TRE	14:35	304	14:00	OBN	ILY	14:40	204	14:00	OBN	TRE	14:35	304	14:00	OBN	ILY	14:40
205	14:50	TRE	COL	15:05	305	14:55	ILY	CSA	15:20	205	14:50	TRE	COL	15:05	305	14:55	ILY	CSA	15:20
206	15:20	COL	OBN	15:50	306	15:35	CSA	OBN	16:05	206	15:20	COL	OBN	15:50	306	15:35	CSA	OBN	16:05

FRIDAY					SATURDAY					SUNDAY				
FLT	STD	FROM	TO	STA	FLT	STD	FROM	TO	STA	FLT	STD	FROM	TO	STA
					209	08:30	OBN	CSA	09:00					
					210	09:15	CSA	OBN	09:45					
					211	10:00	OBN	COL	10:30					
					212	10:45	COL	OBN	11:15					
										211	13:15	OBN	COL	13:45
										212	14:00	COL	OBN	14:30
										213	14:45	OBN	CSA	15:15
										214	15:30	CSA	OBN	16:00

Summer

MONDAY					TUESDAY					WEDNESDAY					THURSDAY				
FLT	STD	FROM	TO	STA	FLT	STD	FROM	TO	STA	FLT	STD	FROM	TO	STA	FLT	STD	FROM	TO	STA
201	08:40	OBN	COL	09:10	301	08:25	OBN	CSA	08:50	201	08:40	OBN	COL	09:10	301	08:25	OBN	CSA	08:50
201	09:20	COL	TRE	09:35	301	09:00	CSA	ILY	09:20	201	09:20	COL	TRE	09:35	301	09:00	CSA	ILY	09:20
202	09:50	TRE	COL	10:05	301	09:30	ILY	OBN	10:05	202	09:50	TRE	COL	10:05	301	09:30	ILY	OBN	10:05
202	10:15	COL	OBN	10:40						202	10:15	COL	OBN	10:40					
204	14:00	OBN	TRE	14:35						204	14:00	OBN	TRE	14:35					
205	14:50	TRE	COL	15:05	307	15:10	OBN	ILY	15:50	205	14:50	TRE	COL	15:05	307	15:10	OBN	ILY	15:50
206	15:20	COL	OBN	15:45	307	16:00	ILY	CSA	16:20	206	15:20	COL	OBN	15:45	307	16:00	ILY	CSA	16:20
					307	16:30	CSA	OBN	16:55						307	16:30	CSA	OBN	16:55

FRIDAY					SATURDAY					SUNDAY				
FLT	STD	FROM	TO	STA	FLT	STD	FROM	TO	STA	FLT	STD	FROM	TO	STA
Scholar flights					No flights					Scholar flights				
211	16:00	OBN	COL	16:30						211	16:00	OBN	COL	16:30
212	16:40	COL	OBN	17:05						212	16:40	COL	OBN	17:05

Option A: With Oban-Barra-Oban

Mon-Fri, or three of these days. New services highlighted in pink

MONDAY					TUESDAY					WEDNESDAY					THURSDAY				
FLT	STD	FROM	TO	STA	FLT	STD	FROM	TO	STA	FLT	STD	FROM	TO	STA	FLT	STD	FROM	TO	STA
201	08:40	OBN	COL	09:10	301	08:25	OBN	CSA	08:50	201	08:40	OBN	COL	09:10	301	08:25	OBN	CSA	08:50
201	09:20	COL	TRE	09:35	301	09:00	CSA	ILY	09:20	201	09:20	COL	TRE	09:35	301	09:00	CSA	ILY	09:20
202	09:50	TRE	COL	10:05	301	09:30	ILY	OBN	10:05	202	09:50	TRE	COL	10:05	301	09:30	ILY	OBN	10:05
202	10:15	COL	OBN	10:40						202	10:15	COL	OBN	10:40					
503	11:00	OBN	BRR	11:45	503	11:00	OBN	BRR	11:45	503	11:00	OBN	BRR	11:45	503	11:00	OBN	BRR	11:45
504	12:00	BRR	OBN	12:45	504	12:00	BRR	OBN	12:45	504	12:00	BRR	OBN	12:45	504	12:00	BRR	OBN	12:45
					307	15:10	OBN	ILY	15:50						307	15:10	OBN	ILY	15:50
206	15:40	OBN	COL	16:10	307	16:00	ILY	CSA	16:20	206	15:40	OBN	COL	16:10	307	16:00	ILY	CSA	16:20
207	16:20	COL	OBN	16:45	307	16:30	CSA	OBN	16:55	207	16:20	COL	OBN	16:45	307	16:30	CSA	OBN	16:55

FRIDAY					SATURDAY					SUNDAY				
FLT	STD	FROM	TO	STA	FLT	STD	FROM	TO	STA	FLT	STD	FROM	TO	STA
503	11:00	OBN	BRR	11:45										
504	12:00	BRR	OBN	12:45										
204	14:00	OBN	TRE	14:35										
205	14:50	TRE	OBN	15:25										
211	15:40	OBN	COL	16:10						211	15:40	OBN	COL	16:10
212	16:20	COL	OBN	16:45						212	16:20	COL	OBN	16:45

Option B: With Oban-Barra-Oban And Oban-Glasgow-Oban

Add Oban-Glasgow-Oban: Double daily Mon-Fri, and single rotation Sun. New services highlighted in pink

MONDAY					TUESDAY					WEDNESDAY					THURSDAY				
FLT	STD	FROM	TO	STA	FLT	STD	FROM	TO	STA	FLT	STD	FROM	TO	STA	FLT	STD	FROM	TO	STA
501	07:00	OBN	GLA	07:30	501	07:00	OBN	GLA	07:30	501	07:00	OBN	GLA	07:30	501	07:00	OBN	GLA	07:30
502	07:55	GLA	OBN	08:25	502	07:55	GLA	OBN	08:25	502	07:55	GLA	OBN	08:25	502	07:55	GLA	OBN	08:25
201	08:40	OBN	COL	09:10	301	08:40	OBN	CSA	09:05	201	08:40	OBN	COL	09:10	301	08:25	OBN	CSA	08:50
202	09:20	COL	TRE	09:35	301	09:15	CSA	ILY	09:35	201	09:20	COL	TRE	09:35	301	09:00	CSA	ILY	09:20
202	09:50	TRE	COL	10:05	301	09:45	ILY	OBN	10:20	202	09:50	TRE	COL	10:05	301	09:30	ILY	OBN	10:05
202	10:15	COL	OBN	10:40						202	10:15	COL	OBN	10:40					
503	11:00	OBN	BRR	11:45	503	11:00	OBN	BRR	11:45	503	11:00	OBN	BRR	11:45	503	11:00	OBN	BRR	11:45
504	12:00	BRR	OBN	12:45	504	12:00	BRR	OBN	12:45	504	12:00	BRR	OBN	12:45	504	12:00	BRR	OBN	12:45
204	14:00	OBN	TRE	14:35						204	14:00	OBN	TRE	14:35					
205	14:50	TRE	OBN	15:25	307	15:00	OBN	ILY	15:40	205	14:50	TRE	OBN	15:25	307	15:00	OBN	ILY	15:40
206	15:40	OBN	COL	16:10	307	15:50	ILY	CSA	16:10	206	15:40	OBN	COL	16:10	307	15:50	ILY	CSA	16:10
207	16:20	COL	OBN	16:45	307	16:20	CSA	OBN	16:45	207	16:20	COL	OBN	16:45	307	16:20	CSA	OBN	16:45
507	17:00	OBN	GLA	17:30	507	17:00	OBN	GLA	17:30	507	17:00	OBN	GLA	17:30	507	17:00	OBN	GLA	17:30
508	17:55	GLA	OBN	18:25	508	17:55	GLA	OBN	18:25	508	17:55	GLA	OBN	18:25	508	17:55	GLA	OBN	18:25

FRIDAY					SATURDAY					SUNDAY				
FLT	STD	FROM	TO	STA	FLT	STD	FROM	TO	STA	FLT	STD	FROM	TO	STA
501	07:00	OBN	GLA	07:30										
502	07:55	GLA	OBN	08:25										
503	11:00	OBN	BRR	11:45										
504	12:00	BRR	OBN	12:45										
204	14:00	OBN	TRE	14:35										
205	14:50	TRE	OBN	15:25										
206	15:40	OBN	COL	16:10						206	15:40	OBN	COL	16:10
207	16:20	COL	OBN	16:45						207	16:20	COL	OBN	16:45
507	17:00	OBN	GLA	17:30						507	17:00	OBN	GLA	17:30
508	17:55	GLA	OBN	18:25						508	17:55	GLA	OBN	18:25