The Highland Council

Planning Development & Infrastructure

2 November 2016

Agenda Item	**14**
Report No	**PDI/ 69/16**

Skye Air Services Business Case 2016

Report by Director of Development and Infrastructure

Summary
This report follows on from an earlier report presented to the Skye and Raasay Committee on 03 October 2016. Subject to the progress of dialogue with Transport Scotland it is intended to circulate a copy of the Final Skye Air Services Business Case 2016 Report to Committee. The focus of this report is on the way forward, working with partners, tackling some of the key development strategy actions identified within the Business Case Report.

1 Background

1.1 The Skye Air Services Business Case Report was commissioned through HITRANS (Regional Transport Partnership) as a collaborative study involving Highland Council and Highlands & Islands Enterprise (HIE).

1.2 The Skye Air Services Business Case Report considers two options for a 771 metre (Code 1C) non-instrument approach airport model using Islander (BN-2B-26) and Twin Otter (DHC-6-300) aircraft.

1.3 The Draft Executive Summary of the report was presented to the Skye and Raasay Committee on 3rd October 2016. The Committee noted the content of the report and gave unanimous support to the development of air services to and from Skye Airport (Ashaig).

1.4 During discussion the local Members highlighted the much broader benefits that would arise from a fully operational airport and have requested that these benefits are highlighted within the report to this Committee.

2 Business Case Summary

2.1 Two significant aspects that influence the potential model for the airport and therefore the overall business case for reintroducing scheduled air services to Skye are worth highlighting:

- Global Navigation Satellite System enables Instrument Approach Procedures (IAP) to be adopted at Skye; and
- new/additional information relating to a broad assessment of the wider socio-economic benefits. This includes four benefit categories: journey time savings; overnight stay savings; Gross Value Added (GVA) impacts; and increased inbound tourist spend.

2.2 The report focuses on two potential options. The key difference between them is the size of the terminal and aprons needed to accommodate the different sized aircraft (Islander and Twin Otter).

2.3 There are comprehensive figures, over a 30 year period, for Costs: Airport Capital Expenditure, Airport Operational Expenditure and Maintenance, Airline Subsidies and Airport Revenue and Benefits: Travel Time Savings, Overnight Stay Savings, GVA Impacts and Tourism Benefits.

2.4 The benefit-cost ratio (BCR) for all benefits for Option A.1 (9-seater aircraft) range from between 1.30 and 1.52 depending on the modelling of high or low capital / operational costs and high or low economic benefits. The BCR (all) for Option A.2 (19-seater) range from 1.87-2.21.

Option	**BCR Range Travel and Overnight Stay**	**BCR Range Wider Benefits**
A1	**0.38 to 0.55**	**1.30 to 1.52**
A2	**0.64 to 0.89**	**1.87 to 2.21**

2.5 A copy of the Executive Summary of the Skye Air Services Business Case 2016 Report is attached at **Appendix 1**. The full report is provided at **Appendix 2**

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3 Broader Benefits

3.1 The earlier Economic and Social Benefits of Proposed Air Services at Skye Airport report commissioned by Highlands & Islands Enterprise (HIE) involved a series of activities including:

- interviewed 20 key businesses in the catchment area;
- analysis of 179 responses from businesses and social enterprises via an online survey;
- consultation with15 stakeholders, including community organisations;
- development of a socio-economic profile of the catchment area; and
- examination of 3 key case study airports, and comparator west of Scotland air services

3.2 The report highlighted a number of socio-economic issues:

- dispersed population, a long distance from the Central Belt, and considerable distance from Inverness;
- long journey times by car and by public transport;
- significant travel constraints, including need for overnight stays over and above long journey times;
- more than half the datazones are designated as Fragile Areas; and
- small business base, and employment decline, although some private sector growth evident, including Creative Industries, Tourism and Food and drink, Professional/Scientific/Technical.

3.3 A summary of the business views was noted as follows:

- many business operating in markets outside Skye and Scotland;
- location of significant importance, especially for key sectors of Creative industries, Tourism and Food & Drink;
- frequent trips to the Central Belt required – nearly 90% make trips, and 40% once a month or more;
- considerable constraints imposed by current transport links – long journey times, overnight stays, driving conditions;
- has wide range of negative consequences for the business, including reduced customer/client contact and reduced sales and investment;
- an air service would address a number of constraints – enabling access to new markets, opportunities, networking, new sales and ways of working; and
- stronger anticipated growth levels with an air service

3.4 The report noted the potential contribution to the economic and tourism strategy that scheduled air services would bring about for Skye and the surrounding area:

Internationalisation: greater access to markets
Investment: increased business confidence
Innovation: support competitiveness
Inclusive growth: increased economic activity
Delivery of health care: potential for improved access, staff training/retention/recruitment
Benefits for Public Transport Users: an alternative form of transport
Impact on Fragile Areas: Less business travel/Reduced isolation/Population attraction/Access to wider range of leisure/culture facilities/ Maintaining family links
Regional Cohesion: Skye one of the most populous parts of Scotland more than 2 hours from an airport

3.5 In addition to the above, there is a potential benefit from the establishment of additional fire-fighting capabilities based at the operational airport. There is already a protocol between Scottish Fire & Rescue and HIAL that involves sharing resources.

3.6 Like most other Scottish airports there would be economic activity in the vicinity of the airport. These businesses can support the airport activities and provide welcome employment opportunities. This could include taxi, car hire, freight and other businesses.

4 Development Strategy

4.1 The Business Case Report sets out a comprehensive series of activities within a 24 month programme to take forward the project.

4.2 What is clearly the most critical activity is that of securing support for the project. Given the existing role of Transport Scotland and HIAL in respect of air services and airports in Scotland it is essential that lobbying with Scottish Government proceeds at the highest level.

4.3 A number of activities have been identified that would unblock the delivery for

air services from Skye Airport. The list of activities, within an ambitious 12-month programme, is set out at **Appendix 3**. They include dialogue and clarification about Air Space requirements, initial airport design works, dialogue with the Planning and Roads authorities, consultation events and submission of a planning application.

4.4 The intention would be that these activities would be taken forward in a continued collaborative approach with HITRANS and HIE. Funding for these activities would be shared in equal proportions. The Committee is requested to approve the proposed activities at **Appendix 3** and a budget allocation of up to £30k as the contribution from Highland Council.

5 Summary

5.1 The Skye Air Services Business Case Report considers two options for a 771 metre (Code 1C) non-instrument approach airport model using Islander (BN-2B-26) and Twin Otter (DHC-6-300) aircraft.

5.2 The BCR (all) values for both options exceed a value of 1.3. Option A2 presents the better BCR (all) values of 1.87 to 2.21.

5.3 The Skye and Raasay Committee requested that the wider benefits from scheduled air services to Skye Airport be highlighted in this report. Members will see from section 3 in this report a broad range of benefits that have already been highlighted through the earlier Economic and Social Benefits of Proposed Air Services at Skye Airport report.

5.4 It is anticipated that dialogue with Hitrans and HIE will continue with a view to engage with Transport Scotland and HIAL.

5.5 A number of activities have been identified that would unblock the delivery for air services from Skye Airport. The list of activities is set out at **Appendix C**. The Committee is requested to approve the proposed development activities and approve allocation of funding of up to £30k as a share of the costs with HITRANS and HIE.

6 Implications

6.1 Resource
Without the funding approval for the proposed development activities there will be delays and difficulties in making progress with the delivery of air services to Skye Airport.

6.2 Legal
No implications at this stage

6.3 Equalities
Provision of air services for Skye and the surrounding area will help to address:

- the need for access to specialist and emergency health services; and
- the fragile area status.

6.4 Climate Change/Carbon Clever
Reducing vehicle journeys will be positive.
The level of additional flights to Skye will be an insignificant proportion of the overall number of flights in Scotland.

6.5 Risk
This project is unaffordable for Highland Council alone. Without Scottish Government intervention there is a substantial risk for the re-introduction of scheduled flights to Skye. Lobbying is essential to gain support for the delivery of scheduled air services.

6.6 Gaelic
The cultural aspect of the area has been recognised as part of the socio-economic benefit. Part of the new upgraded airport could include Gaelic promotion material.

6.7 Rural
The response to the socio-economic study indicated a substantial desire for flights to Skye with wider benefits to Lochalsh and Wester Ross.

Recommendation

Committee is invited to:

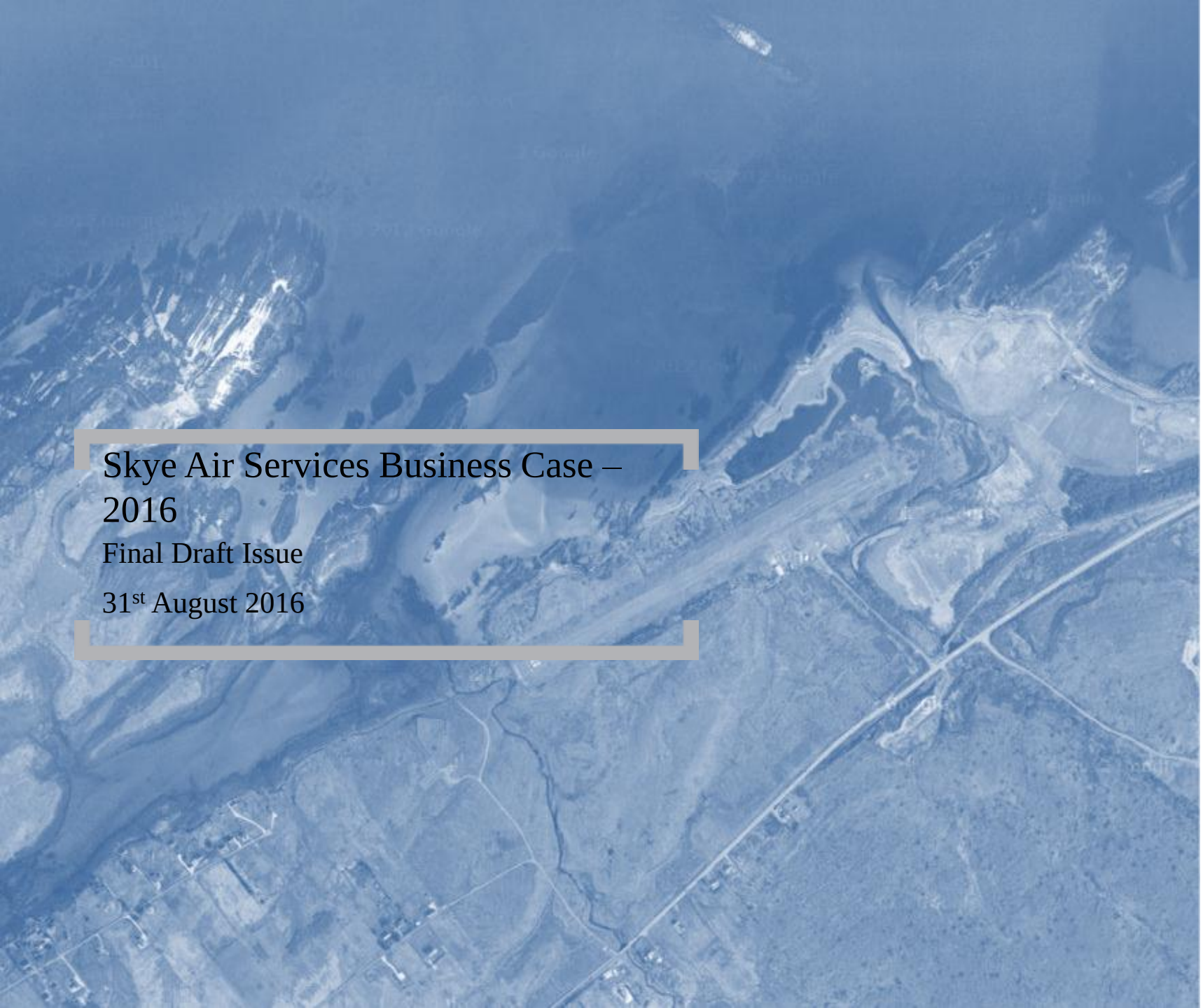
- note the contents of this report;
- note the contents of the Skye Air Services Business Case 2016 Report;
- provide comments on the report findings;
- confirm support for the re-introduction of scheduled air services to Skye Airport;
- agree to the continued lobbying of Scottish Government and its agencies; and
- approve the proposed short-term development activities (Appendix C), through continued collaboration with HITRANS and HIE, with a budget allocation of up to £30k.

Designation:	Director of Development & Infrastructure
Date:	7 October 2016
Author:	Richard Gerring Transport Planning Manager

Background Papers:

3 October 2016 Skye and Raasay Committee (SR/20/16)

http://www.highland.gov.uk/download/meetings/id/70934/item_8_skye_air_services_business_case_2016



Skye Air Services Business Case – 2016

Final Draft Issue

31st August 2016

HITRANS
THE HIGHLANDS AND ISLANDS TRANSPORT PARTNERSHIP

HIE
Highlands and Islands Enterprise
Iomairt na Gàidhealtachd 's nan Eilean

The Highland Council
Comhairle na Gàidhealtachd

RDC
Aviation Economics

ARUP

Limitations of Report

In accordance with the terms of reference set out in our agreement with HITRANS, this report documents our findings in relation to the business case update of operating air services at Broadford Airfield, Skye.

This report takes into account the particular requirements of HITRANS, Highland Council and HIE. It was prepared solely for the purpose of providing supporting data to HITRANS, Highland Council and HIE in assessing the feasibility of operating air services to Skye and should not be relied on for any other purposes.

This report is not intended for, and should not be relied on, by any third party and no responsibility is undertaken to any third party.

Executive Summary

Introduction

- This report assesses the business case for developing air services to Skye using the Skye Airport Services Feasibility Study undertaken in 2013 by Arup and RDC as the bases and incorporating additional newly available data. It builds on the early feasibility work, incorporates impacts of navigation technology advances since the last study and develops BCRs for a range of the most promising infrastructure and operational options.
- The main changes incorporated into this study include:
  - Updating the passenger forecasts using new data from the 2013 CAA survey, more up-to-date demand data from comparator HIAL airports and updated regional economic data.
  - A review of CAP1122 'Application of Instrument Approach Procedures to Aerodromes without an Instrument Runway and/or Approach Control', issued by the CAA in May 2014.
  - Development of further variations of the previous infrastructure options, such that they can support the requirements of RNAV approaches.
  - Update of the CAPEX estimates for the various infrastructure options based on RNAV requirements.
  - Updating the CAPEX and airport OPEX estimates using a 2016 cost baseline and benchmarking with works done at other airports where appropriate.
  - Updating the airline commercial analysis and PSO support requirements, including assessing some additional aircraft types.
  - Updating the wider economic benefits analysis based on the recent work carried out by Ekosgen (Economic and Social Benefits of Proposed Air Services at Skye Airport for Highlands and Islands Enterprise, January 2016).

Infrastructure Review

- The airfield infrastructure review undertaken in this study supports the advice previously given to HITRANS, HIE and the Highland Council that the use of GNSS (Global Navigation Satellite System) technology is likely to be highly appropriate to support new scheduled air services to Broadford Aerodrome and could enable Instrument Approach Procedures (IAP) to be adopted.
- The development of IAPs using GNSS will require risk assessment based arguments to be presented to the CAA and their approval sought. The publication of CAP1122 'Application of Instrument Approach Procedures to Aerodromes without an Instrument Runway and/or Approach Control' by the CAA in May 2014 provides a process for doing this and based on precedents' established at other airports it is considered reasonable to assume that agreement can be gained to adopt this approach at Skye.

Executive Summary

- If this is the case, it is likely that the airstrip could be used in its current configuration and approach procedures developed which might achieve a cloud base minima of approximately 500-600ft. It is considered that this will be suitable to allow an experienced operator to run commercially reliable services.
- Investment would be needed in support facilities, such as terminal facilities, aprons, road access and car parking, and the airfield lighting would need upgrading to allow night-time operations.
- This current study focuses on two variants of the 2013 Study Option A and assess the updated costs and benefits of each. The two variants, referred to as Option A.1 and A.2, are based on the existing 771m runway and facilities to support 9-seater and 19-seater aircraft respectively. Key difference are in the size of the terminal and aprons needed to accommodate the different sized aircraft.
- Option A.1 represents the minimum capital investment needed to the existing airfield to accommodate 9-seater (or with CAA approval a 13 seat) aircraft with RNAV and is estimated to be approximately £3.1m to £4.0m.
- Option A.2 represents the minimum capital investment needed to the existing airfield to accommodate 19-seater aircraft with RNAV and is estimated to be approximately £4.1m to £5.0m.
- The study has also reviewed the other options investigated in the 2013 study and considered if there are other more viable options. This review concluded that 2013 Study Options and the two variants of Option A covered the range of options that were most suitable for consideration at Broadford.
- The costs of Options B, C and D from the 2013 Study have been updated and range from £6.1 to £19.1m in 2016 prices. The differences in the transport-user benefits delivered for these options and the Options A.2 variant is minimal as each of them can support air services which can accommodate the projected passenger demand for a service to Glasgow. For this reason, the Client Steering Group has concluded that Options B-D are not currently affordable and do not deliver sufficient additional benefits to warrant continued investigation at this stage.

Traffic Forecast Update

- Updated forecast analysis estimates that the current unconstrained demand for air services from Skye to Glasgow is of the order of 23,800 passengers per annum. This compares to 21,500 passengers per annum estimated in the 2013 Study.
- Twin Otters, Trislanders and Dornier 228, each having a seat capacity of around 19 seats, and the Cessna Grand Caravan has a capacity of 13 passengers in its maximum seat configuration. Each can operate within the 750m length restrictions of the current airstrip, without significant restrictions to payload.
- The Cessna Grand Caravan is a singled engine aircraft and current European legislation does not allow the use of singled engine aircraft for scheduled services at night or in conditions of poor visibility. This legislation is being reviewed and there are indications that this restriction will be relaxed but no change in policy has yet been announced.
- The Let 410 also has a seat capacity of 19 but payload restrictions would mean it could only carry 8-9 passengers on a service to Glasgow using the existing 750m airstrip.

Executive Summary

- Taking into consideration the likely achievable average aircraft load factors, bottom up estimates indicate that traffic forecasts for a 12x weekly service on a 19-seat aircraft to/from Glasgow would be approximately 15,100 passengers per annum.
- Equivalent forecasts for a 21x weekly service on a 9-seat aircraft to/from Glasgow would be approximately 12,700 passengers per annum
- Irrespective of the aircraft size, demand hits its peak in the summer months and a dedicated aircraft may be able to operate additional frequencies and accommodate more passengers during the summer season.

Commercial Model

- Based on the commercial analysis of airline costs the required break even one-way fare (including 10% profit margin) ranges from £125-£160 for Glasgow services.
- Fares even at the lower end of this range are considered to be slightly higher than the level that passengers might be willing to pay based on benchmark comparisons and the 2013 user survey feedback.
- On this basis, operation of unsubsidised services are likely, at best, to be only marginally viable. It is more likely that assistance, both financially and in terms of marketing and other support, would be needed to attract airlines to establish and maintain regular scheduled air services to Skye.
- Aircraft availability is likely to be an important issue. Operators seek to operate as few different types of aircraft as possible to simplify availability of spares and crew training. There are relatively few operators that have the appropriate equipment for serving Skye Broadford. The potential return (profit) is unlikely to be large enough/attractive enough to warrant obtaining new equipment and therefore the number of potential operators will be limited.
- There is no evidence of substantial willingness to over-pay above the break even fares derived from the airline cost analysis. Therefore there is unlikely to be high potential for 'upside' for airline revenues, limiting the attractiveness for them to invest without a PSO[1] being in place to protect them contractually.
- Whilst PSO is likely to be the preferred model for operators, it's not the only option. Marketing support or some form of risk share may be acceptable to airlines; or the ability to access or apply to some form of centralised funding to support new routes, such as the Regional Air Connectivity Fund. However, the risk of these shorter term funding solutions is that they may not achieve the connectivity objectives, service levels or route frequency guarantees that come with PSO designation.

1. PSO – Public Service Obligation. An arrangement where the cost of providing specific air services are subsidised

Executive Summary

Benefit-Cost Analysis

- A range of Benefit / Cost ratio scenarios has been tested for each of Options A.1 and A.2, based on the data derived in the report.
- Option A.1 has terminal and other facilities sized for an aircraft capacity of 9-seats (or with CAA approval a 13 seat) and therefore traffic forecast, PSO subsidy and landing fee data based on the Islander operating 21x weekly services to Glasgow has been used to derive the BCRs for this option.
- Option A.2 can accommodate aircraft up to 19-seats. The BCR assessment for this option has been based on Twin Otter (DHC-6-300) which is considered the aircraft most operators would choose to use on a Skye-Glasgow service.
- All costs and benefits expressed as a Net Present Value (NPV) use a 3.5% discount rate to 2016 prices with a 30 year evaluation period from start of services assumed to be in 2018. Construction costs are assumed to be incurred in 2017.
- Airline subsidies are based on the range of estimates for Islander and Twin Otter series 300 services to Glasgow and cover requirements to support airline operating costs including airport charges.
- Four categories of benefits have been quantified; journey time savings, overnight stay savings, GVA impacts and increased inbound tourist spend. These four benefits have been used to derive a range of BCRs scenarios, which use Base, Upper and Lower estimates for various cost and benefit elements.
- Two sets of BCR scenarios are presented on the following tables, one including only journey time and overnight stay time benefits and a second set which include all four benefit categories.
- The GVA impact as a result of direct employment, support services/functions and supply chain activity have been estimated to create 31 additional FTE's and GVA benefits of £1.3m annually. This is assumed to be the same for both Options A.1 and A.2 as it is considered likely that the same staffing levels would be required to manage and operate the airport in both configurations.
- Tourism benefits, also derived in Section 4.4, are based on the estimate of stimulated visitor spend which is additional for Scotland as a whole. This is only a proportion of the total stimulated visitor spend within Skye and Lochalsh as discussed in the economic appraisal section of the report.

Executive Summary

Benefit-Cost Analysis Option A.1

- Option A.1 has terminal and other facilities sized for an aircraft capacity of 9-seats and therefore traffic forecast, PSO subsidy and landing fee data based on the Islander operating 21x weekly services to Glasgow has been used to derive the BCRs for this option.

Costs	NPV (Discount rate of 3.5% to 2016 over 30 years)		
	Base	Lower	Upper
Airport CAPEX	(£3.6m)	(£3.3m)	(£4.0m)
Airport OPEX and Maintenance	(£13.8m)	(£12.6m)	(£15.2m)
Airline subsidies	(£15.4m)	As Base	As Base
Airport Revenue	£4.6m	As Base	As Base
Total	**(£28.3m)**	**(£26.7m)**	**(£30.1m)**

Benefits	NPV (Discount rate of 3.5% to 2016 over 30 years)		
	Base	Lower	Upper
Journey time savings benefits	£10.8m	£8.8m	£12.9m
Overnight time savings benefits	£2.3m	£1.9m	£2.7m
GVA impact	£23.6	As Base	As Base
Tourism benefits	£3.2m	£2.6m	£3.8m
Total	**£39.9m**	**£36.8m**	**£43.0m**

Executive Summary

Benefit Cost Analysis – Option A.1

Option A.1 Scenarios	Assumptions	BCR Time Saving Benefits only [1]	BCR All Benefits [2]
Base	All costs and benefits based on BASE values in tables on previous page.	0.46	1.41
1 - Low CAPEX & O&M	As for Base Scenario but with lower values for CAPEX and O&M cost	0.49	1.49
2 - High CAPEX & O&M	As for Base Scenario but with upper values for CAPEX and O&M cost	0.44	1.33
3 - Low Economic Benefits	As for Base Scenario but with lower values for time saving and tourism benefits.	0.38	1.30
4 - High Economic Benefits	As for Base Scenario but with upper values for time saving and tourism benefits.	0.55	1.52

[1] Includes only Journey Time Saving and Overnight Stay Savings tabulated on previous page
[2] Includes all four categories of benefit tabulated on the table on previous page

Executive Summary

Benefit-Cost Analysis Option A.2

- Option A.2 has terminal and other facilities sized for an aircraft capacity of 19-seats and therefore traffic forecast, PSO subsidy and landing fee data based on the Twin Otter operating 12x weekly services to Glasgow has been used to derive the BCRs for this option.

Costs	NPV (Discount rate of 3.5% to 2016 over 30 years)		
	Base	Lower	Upper
Airport CAPEX	(£4.6m)	(£4.1m)	(£5.0m)
Airport OPEX and Maintenance	(£14.4m)	(£13.1m)	(£15.9m)
Airline subsidies	(£7.4m)	As Base	As Base
Airport Revenue	£5.2m	As Base	As Base
Total	**(£21.2m)**	**(£19.4m)**	**(£23.1m)**

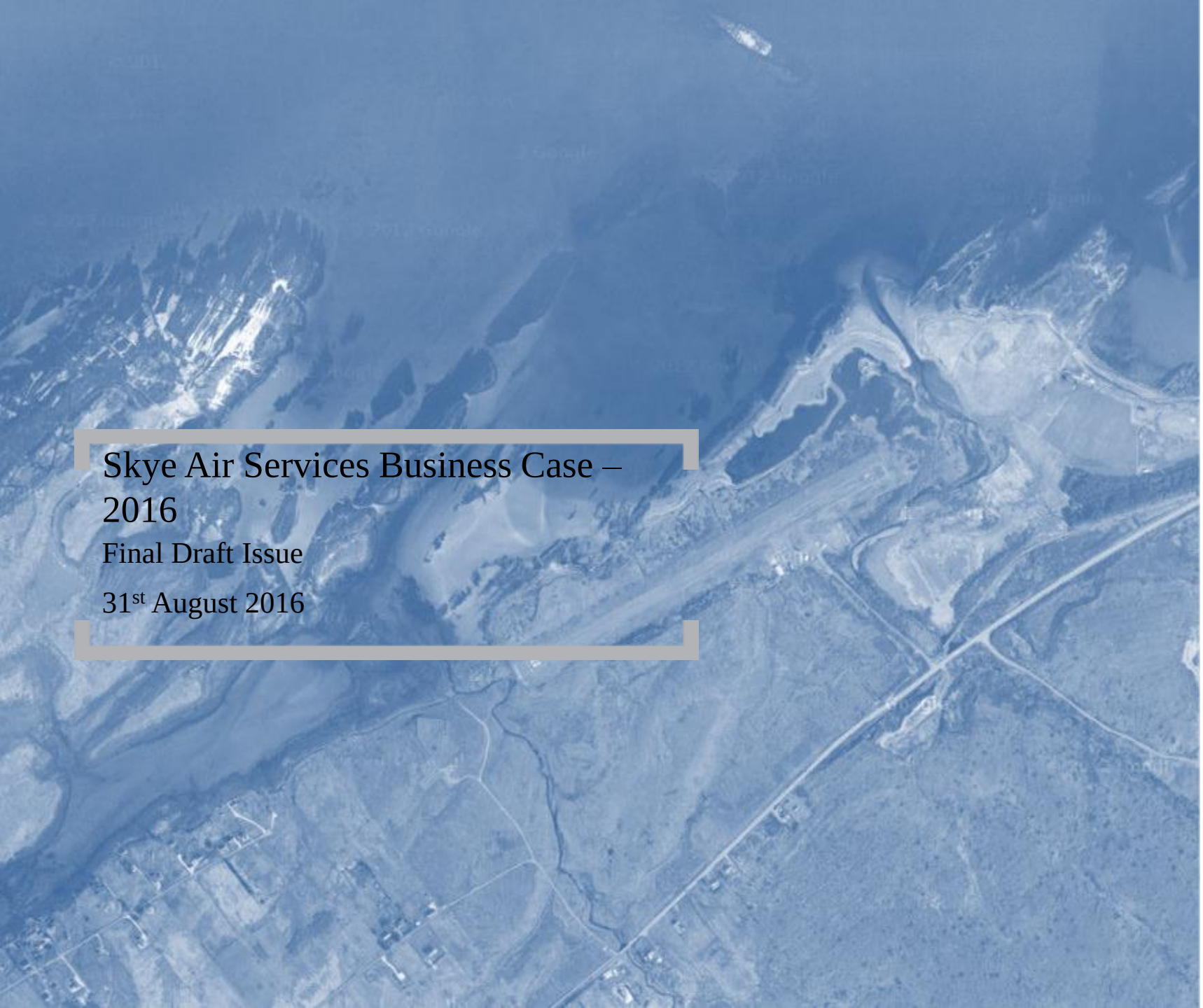
Benefits	NPV (Discount rate of 3.5% to 2016 over 30 years)		
	Base	Lower	Upper
Journey time savings benefits	£13.2m	£10.8m	£15.6m
Overnight time savings benefits	£2.7m	£2.2m	£3.2m
GVA impact	£23.6	As Base	As Base
Tourism benefits	£3.7m	£3.1m	£4.4m
Total	**£43.2m**	**£39.7m**	**£46.8m**

Executive Summary

Benefit Cost Analysis – Option A.2

Option A.2 Scenarios	Assumptions	BCR Time Saving Benefits only [1]	BCR All Benefits [2]
Base	All costs and benefits based on BASE values in tables on previous page.	0.75	2.04
1 - Low CAPEX & O&M	As for Base Scenario but with lower values for CAPEX and O&M cost	0.82	1.87
2 - High CAPEX & O&M	As for Base Scenario but with upper values for CAPEX and O&M cost	0.69	1.87
3 - Low Economic Benefits	As for Base Scenario but with lower values for time saving and tourism benefits.	0.61	1.88
4 - High Economic Benefits	As for Base Scenario but with upper values for time saving and tourism benefits.	0.89	2.21

[1] Includes only Journey Time Saving and Overnight Stay Savings tabulated on previous page
[2] Includes all four categories of benefit tabulated on the table on previous page



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Contents

Glossary

1. Introduction

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- The main changes incorporated into this study include:
  - Updating the passenger forecasts using new data from the 2013 CAA survey, more up-to-date demand data from comparator HIAL airports and updated regional economic data.
  - A review of CAP1122 'Application of Instrument Approach Procedures to Aerodromes without an Instrument Runway and/or Approach Control', issued by the CAA in May 2014.
  - Development of further variations of the previous infrastructure options, such that they can support the requirements of RNAV approaches.
  - Update of the CAPEX estimates for the various infrastructure options based on RNAV requirements.
  - Updating the CAPEX and airport OPEX estimates using a 2016 cost baseline and benchmarking with works done at other airports where appropriate, along with incorporating the runway refurbishment cost estimates prepared by AECOM and included in their August 2106 report 'Isle of Skye (Ashaig/Broadford) Airfield Maintenance Inspections'.
  - Updating the airline commercial analysis and PSO support requirements, including assessing some additional aircraft types.
  - Updating the wider economic benefits analysis based on the recent work carried out by Ekosgen (Economic and Social Benefits of Proposed Air Services at Skye Airport for Highlands and Islands Enterprise, January 2016).

2. Study Background

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2.3 Benchmarking review of other air service routes

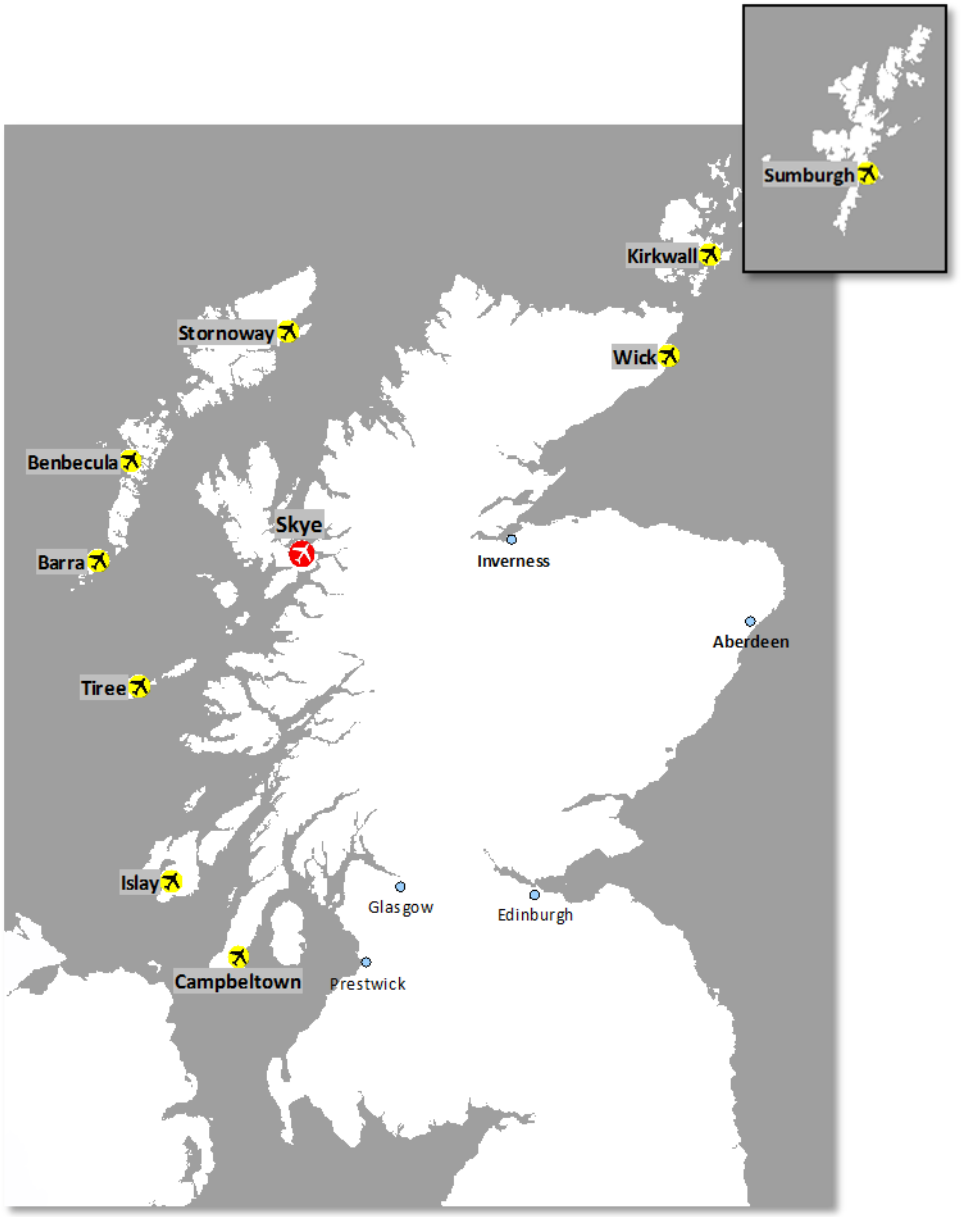
Benchmark Airport Group

- The HIAL Airport group has been chosen as a benchmark group due to their similarities with Skye in terms of serving remote regions and having limited/time-consuming journeys to the main Scottish lowland area.

- In terms of location, only two of the benchmark airports are located on the mainland – Wick and Campbeltown, but again remain remote from the main business/population centres in the lowlands area.

- For comparison, runway lengths and 2015 total passengers at these benchmark airports are shown below. Skye's current runway is smaller than other benchmark airports, being comparable to Barra. Typically, the benchmark airports have a runway length of 1,400m to 1,800m.

- The number of passengers at the benchmark airports range from 8,288 (Campbeltown) through to 159,859 (Kirkwall) – the more remote islands (Stornoway, Sumburgh and Kirkwall) having a greater volume of traffic.



Overview of benchmark airports (Source: Eurocontrol AIP, CAA)

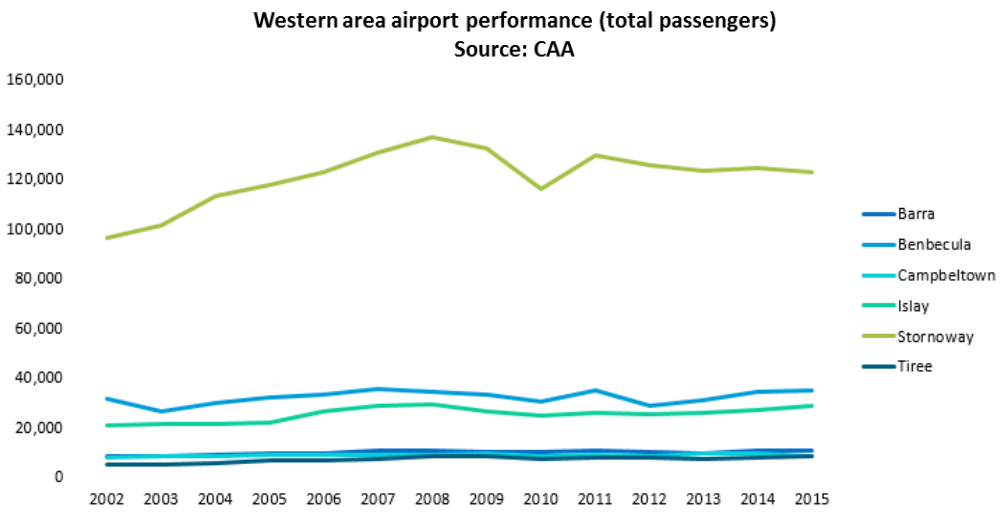
Airport Name	IATA Code	Maximum Runway length (m)	2015 Total Passengers
Barra	BRR	846	10,658
Benbecula	BEB	1,836	35,145
Campbeltown	CAL	1,750	8,288
Islay	ILY	1,545	28,716
Kirkwall	KOI	1,428	159,859
Stornoway	SYY	2,315	122,663
Sumburgh	LSI	1,426	260,890
Tiree	TRE	1,472	8,675
Wick	WIC	1,825	24,993
Skye	**SKL**	**753**	0

2. Study Background

2.3 Benchmarking review of other air service routes

Benchmark Airport Performance – Western airport total passengers

- Passenger traffic at the western area airports within the benchmark group has shown a steady performance over the last 10 years, with all showing flat, or slightly positive, growth.
- Stornoway, the most remote of the western isles, has the largest volume of total passengers and one of the strongest growth, with traffic up from 105,000 passengers in 2002 to 122,600 in 2015 and a CAGR of 1.75%.
- In comparison, other western area airports have seen much lower growth (both in percentage and absolute terms). Both Benbecula and Islay have added 4,000-8,000 passengers over the last 13 years, with CAGRs of 0.8% and 2.3% respectively.
- The smaller airports (Barra, Campbeltown and Tiree) have seen lower absolute growth in passenger traffic (150 -3,400 over the thirteen-year period), but all have remained below 15,000 passengers in total over the period.
- It is worth noting that all UK air services in 2010 were severely impacted by the volcanic ash cloud crisis in April and May and, to a lesser extent, severe weather across the UK in December 2010, leading to an extra-ordinary drop in passenger traffic.



Western area airport performance to 2002 to 2015 (Source: CAA)

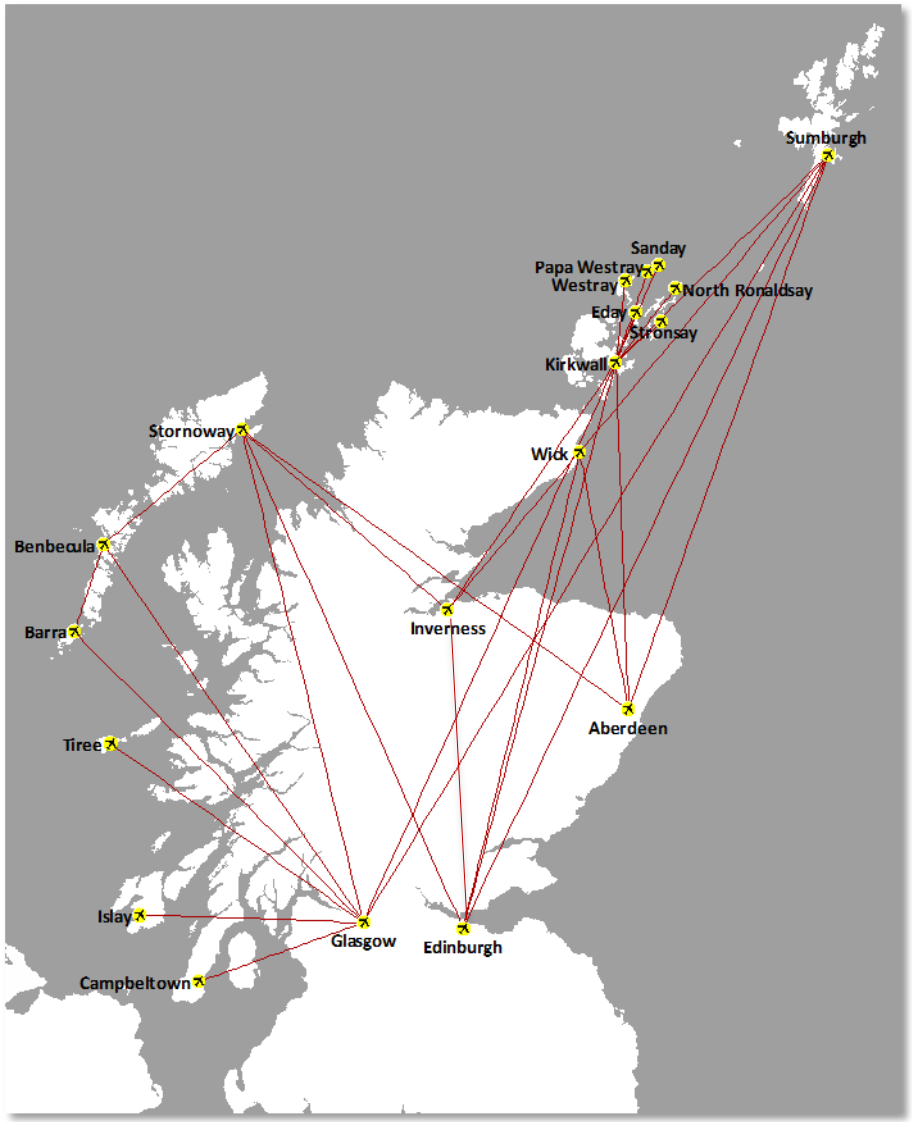
Airport Name	Change in passengers (2002-2015)	2002-2015 CAGR
Stornoway	26,442	1.75%
Benbecula	3,586	0.77%
Islay	7,883	2.32%
Barra	2,344	1.79%
Campbeltown	146	0.13%
Tiree	3,373	3.58%

2. Study Background

2.3 Benchmarking review of other air service routes

Benchmark Airport Network – All Services

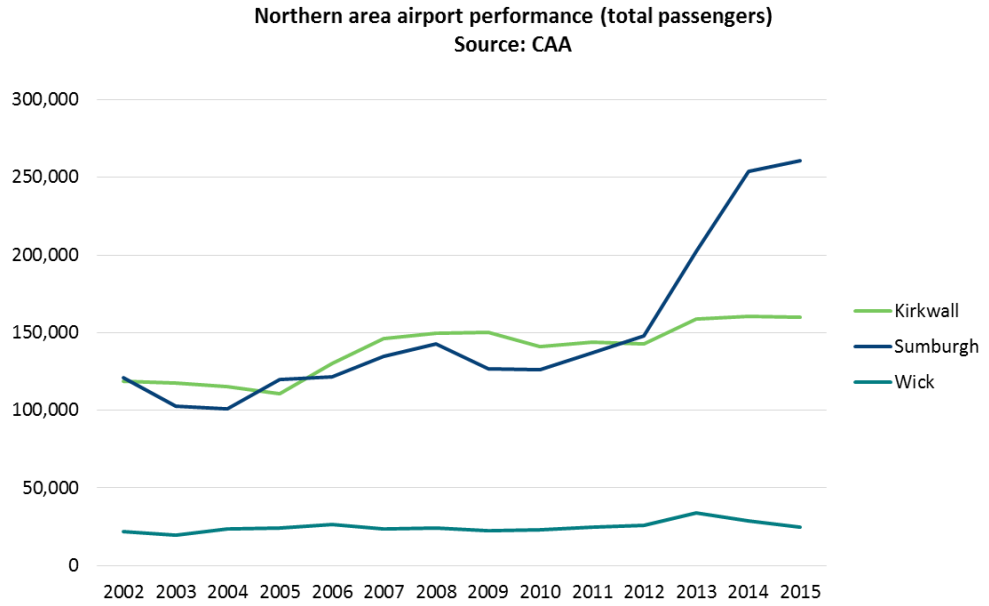
- An overview of the 2016 published route network from the benchmark airport group is shown on the right.
- In general, those airports serving the remote western areas are linked to Glasgow while those to the north are linked to Edinburgh, Inverness and Aberdeen.
- In addition to the mainland services, the western isles are inter-connected (Stornoway-Benbecula-Barra), while the northern isles have a range of intra-islands services, mainly between Kirkwall and the outlying Orkney islands.
- Only Stornoway in the western group of airports has services to mainland airports beyond Glasgow International (Glasgow Prestwick having no services at all to the HIAL group), being linked to Edinburgh, Inverness and Aberdeen.
- This suggests that Glasgow International is the preferred airport for operations from the western areas of Scotland and air services to/from Skye could follow this pattern.



2.3 Benchmarking review of other air service routes

Benchmark Airport Performance – Northern airport total passengers

- Kirkwall and Sumburgh handle similar passenger volumes (152,000 and 145,000 respectively in 2011) but Sumburgh had (since 2011) a CAGR of 14% to reach a traffic figure reaching over 260,000 passengers while Kirkwall had a slower CAGR around the 2%.
- Wick, however, remains significantly smaller than the remote island airports, handling just over 24,000 passengers in 2015. Of all the airports within the benchmark group, Wick is the only one to have seen traffic drop over the last 14 years, with a almost null CAGR of 0.9%.
- Total passenger numbers at Wick fell between 2007 and 2008 when services to Kirkwall Airport were dropped.



Northern area airport performance to 2002 to 2015 (Source: CAA)

Airport Name	Change in passengers (2002-2015)	2002-2015 CAGR
Kirkwall	41,158	2.15%
Sumburgh	139,726	5.63%
Wick	3,116	0.96%

2. Study Background

2.3 Benchmarking review of other air service routes

Benchmark Airport Performance – Mainland routes

- When considering services to mainland airports only, all benchmark airports haver seen growth in passenger traffic (CAGRs of between 0.11% and 4.79%) – slightly stronger than total airport performance (3.07% CAGR on the same period).
- Despite Wick's traffic falling overall, mainland service passenger numbers have grown by 10,500 since 2002, indicating that the drop in overall traffic was due to a reduction in services to island airports.
- While there has been some dips in mainland passengers (such as Kirkwall in 2005 and Stornoway in 2010), traffic has quickly rebounded to pre-dip levels.
- The performance of peers indicates that air services from Skye are likely to grow at a steady rate, with some of the smaller airports (such as Tiree, Campbeltown and Barra) adding an average of 150 passengers per annum in the last 10 years.
- The annual volume of mainland passengers vary, with 100,000+ for Stornoway, 20,000+ for Benbecula and Islay, and smaller volume of less than 10,000 for the rest.
- As a comparison, Donegal Airport in Ireland operates a PSO service to Dublin carrying around 24,000 passengers in 2014, similar level as mainland traffic from Benbecula and Islay. Although Donegal has a larger catchment, the airport profile is similar to Skye, being geographically remote from Dublin (4.5hours) and having large dependence on the tourism sector.

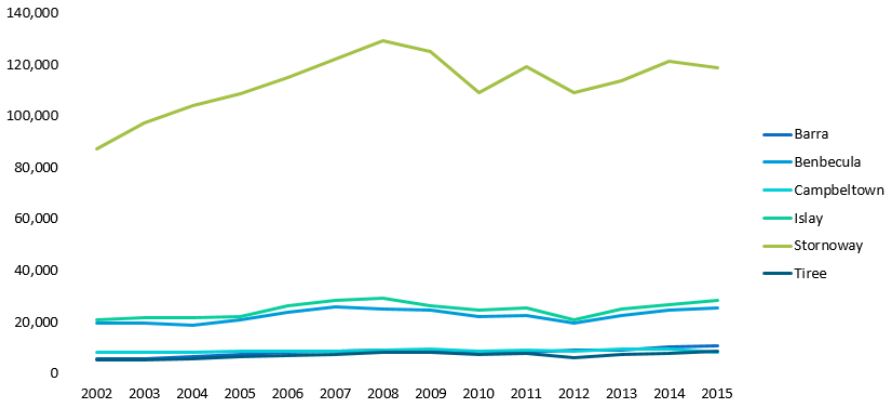
Western area airport performance (Mainland services) 2002 to 2015 (Source: CAA)

Airport Name	Change in passengers (2002-2015)	2002-2015 CAGR
Stornoway	31,558	2.23%
Benbecula	5,957	1.91%
Islay	7,530	2.23%
Barra	5,136	4.79%
Campbeltown	128	0.11%
Tiree	3,194	3.43%

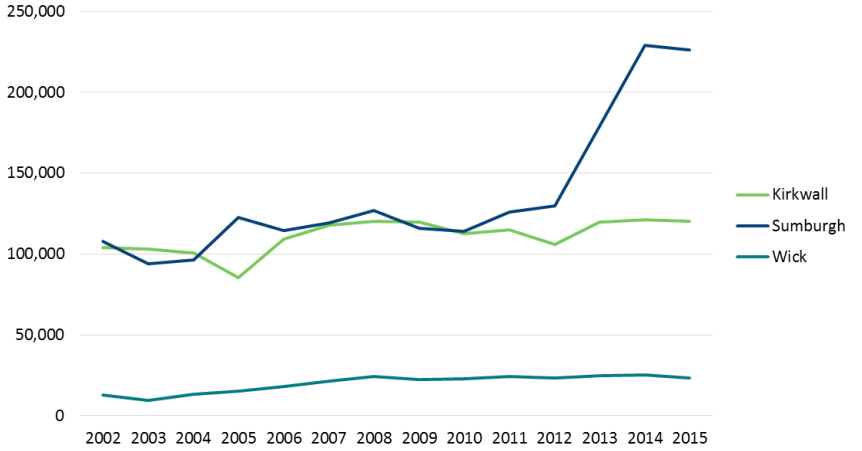
Northern area airport performance (Mainland services) 2002 to 2015 (Source: CAA)

Airport Name	Change in passengers (2002-2015)	2002-2015 CAGR
Kirkwall	15,849	1.02%
Sumburgh	118,540	5.45%
Wick	10,485	4.37%

Western area airport performance (passengers to mainland services) 2002 to 2015 (Source: CAA)



Northern area airport performance (passengers to mainland services) 2002 to 2015 (Source: CAA)



2. Study Background

2.3 Benchmarking review of other air service routes

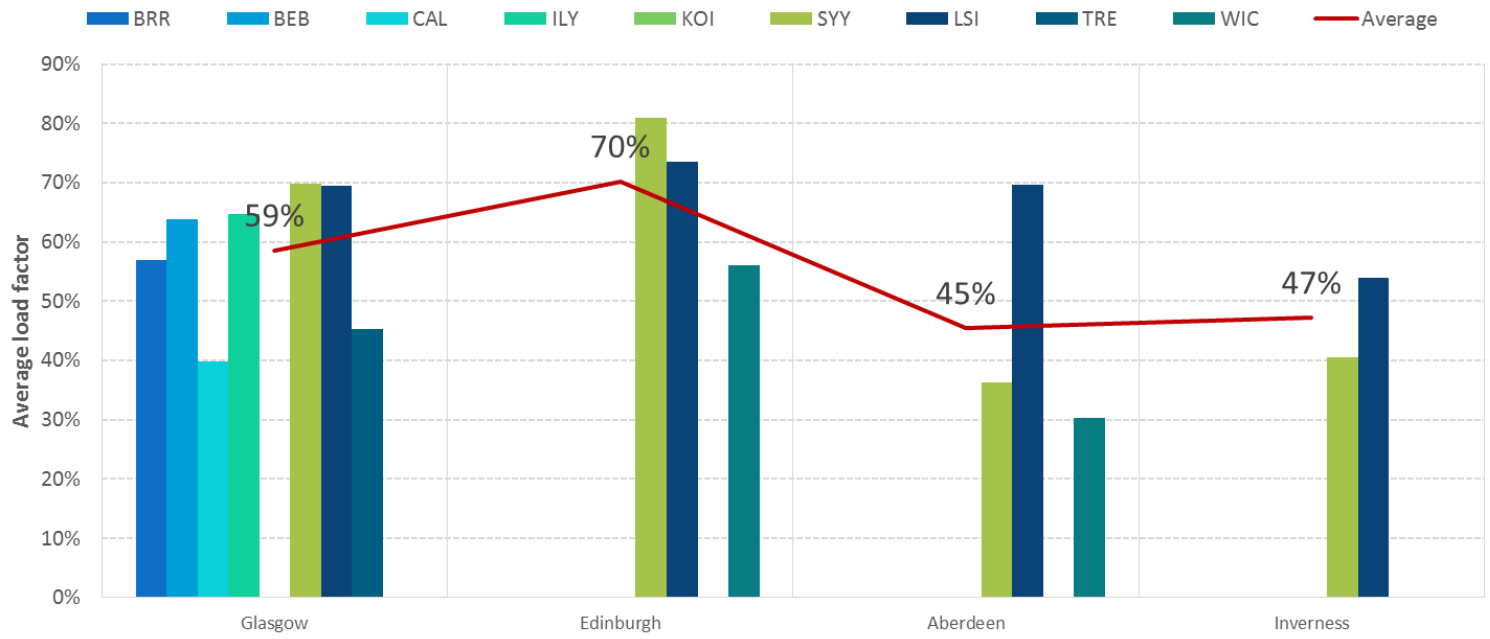
Benchmark Airport Performance – HIAL route load factors to mainland Scottish airports

- The chart below summarises the load factors on HIAL services to mainland Scottish airports for 2015. On average, services to Edinburgh achieved the highest average load factor of 70%, ranging from 56% (Wick) to 86% (Stornoway).

- Services to Glasgow had a similar average load factor (59%), and again had a similar range of route load factors from 40% (Campbeltown) to 69% (Stornoway and Sumburgh).

- Services to Aberdeen and Inverness had lower load factors (45% and 47% respectively), indicating that in general, there is greater demand from HIAL airports to the two largest cities in Scotland – Glasgow and Edinburgh.

2015 Route Load Factors to mainland Scottish Airports
Source: CAA, RDC Apex



2. Study Background

2.3 Benchmarking review of other air service routes

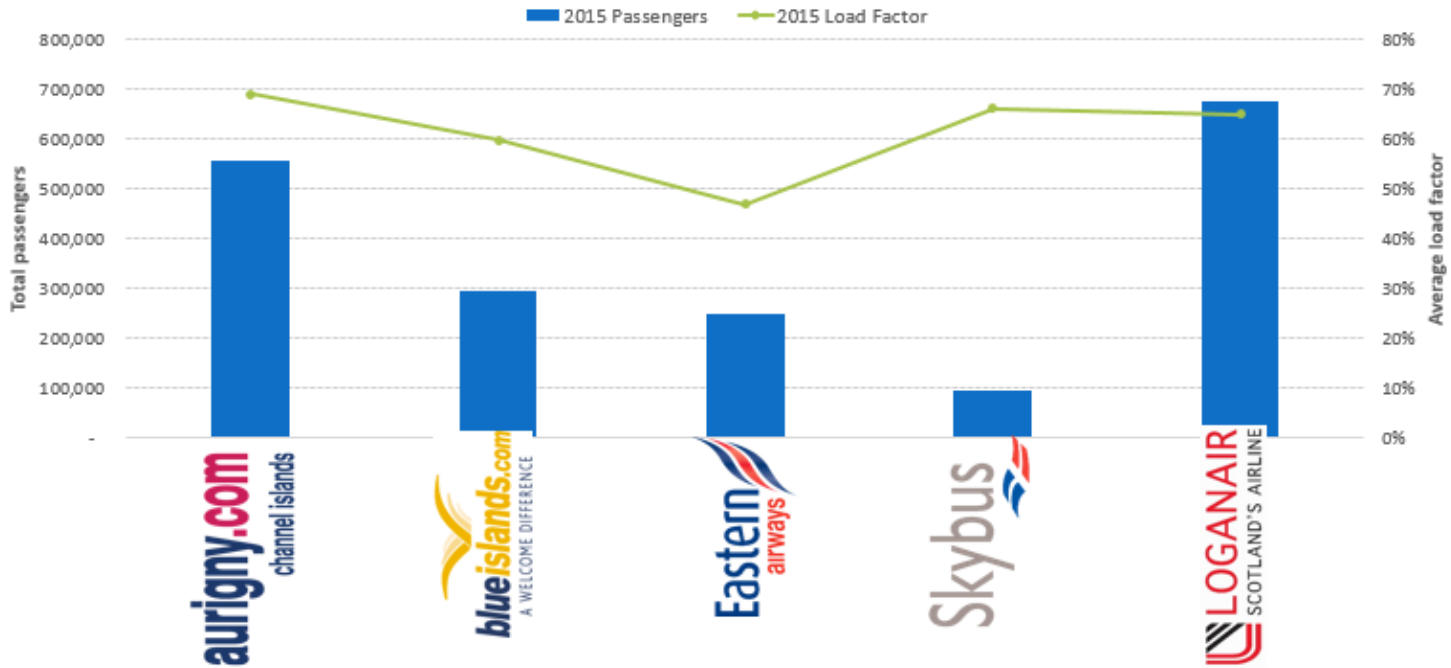
Regional airline performance

- An overview of the performance of the main British regional airlines during 2015 (handling under 1m passengers per annum) is provided below. Of these airlines, Loganair and Eastern Airways are the only ones to operate to/from Scottish airports, with the former being the most dominant, especially for services to/from HIAL airports.

- Loganair's average load factor during 2011 was 65% - one of the highest from the regional airline group – and handled just over 670,000 passengers. While Eastern Airways handled fewer passengers (almost 250,000) its load factor was lower at just over 47%.

- Other regional airlines operated with load factors of between 60% and 69%. It should be noted that operations with Air Southwest, purchased by Eastern Airways in late 2010, were eventually halted in late 2011.

Regional airline overall performance – 2015 (Source: CAA)



3. Airfield Infrastructure

3. Airfield Infrastructure

3.1 Context

Area Navigation Instrument Approach Procedures

- Instrument Approach Procedures (IAPs) provide an instrument approach capability which enhances reliability of service and safety. This is especially relevant in areas of high terrain/relief, changeable weather conditions and long periods of winter darkness as experienced in the vicinity of the Isle of Skye.
- IAPs have previously been reliant on expensive ground based navigational aid installations but Area Navigation (RNAV) procedures that are based on Global Navigation Satellite System (GNSS) technology are now replacing 'conventional' IAPs, especially at smaller and remote aerodromes.
- It is considered that the most viable option to enhancing the operational attractiveness of service to Broadford Aerodrome would be using RNAV Approaches.
- RNAV procedures that provide Localiser Performance with Vertical guidance (LPV) are considered to be 'precision approaches'. These procedures, together with Lateral Navigation (LNAV) non-precision approaches would provide modern and appropriate IAPs.
- However, the instrument approach minima will depend on the airfield infrastructure. To obtain maximum benefit of using RNAV IAP's in terms of low approach minima (i.e. the height limit of base cloud cover which is allowable for the approach procedure), airfield run-off areas and clearances complying with UK CAA CAP168 criteria would still be required.
- CAP1122 provides a Risk-Based methodology for seeking approval for instrument procedures at airfields that are not fully compliant with CAP 168 criteria, with improved night and poor weather performance compared to Visual Approach Procedures. This provides a methodology for optimising instrument approach benefits against infrastructure investment, allowing some of the minima benefits to be realised without providing fully CAP168 instrument approach compliant infrastructure.

IAPs at Aerodromes with no Approach Control and/or Instrument Runway

- The current promulgated UK CAA policy is that IAPs are:

  "only authorised to suitable instrument runways, at appropriately equipped Licensed aerodromes with Air Traffic Control (ATC) services. However, exceptionally, the CAA may approve a procedure to a non-instrument runway, subject to a case by case assessment".
- Broadford has no approach control facility nor is there a nearby unit that could provide such under a local 'joint' arrangement. However, provision of Aerodrome Flight Information Service [AFIS] is likely to be acceptable under CAP1122 for operations at Broadford and would be feasible to implement.
- The CAA policy has moved away from Standards Based policy to a more Risk-Based policy under CAP1122. This provides the opportunity to develop site specific risk based assessments to allow the employment of safe and effective operations under Instrument Flight Rules (IFR) utilising RNAV IAPs.
- This study is therefore undertaken under the auspices of the CAA accepting Broadford Aerodrome as an exceptional case. Case studies for approved procedures at a range of other airports are provided in Appendix A, which supports the view that the CAA would consider this to be the case.
- As the requirements of CAP1122 are non-prescriptive in nature, until a risk assessment analysis is undertake and discussions held with the CAA, it is not possible to predict with complete certainty the procedures and associated required infrastructures that the CAA will be willing to approve.
- In the assessment of infrastructure requirements contained in this report we have used our experience and professional judgement, based on previous projects and previous discussions with the CAA, to provide an informed view of the likely position taken by the CAA. It should be noted that there are relatively few precedent examples of approved RNAV IAPs and consequently clarity of how the standards should be applied are still emerging.

[1] TODA is the declared Take Off Distance Available
[2] ASDA is the Accelerate and Stop Distance Available

3. Airfield Infrastructure

3.1 Context

2013 Study Runway Options

- The runway at Broadford is currently unlicensed. The previous Arup Skye Air Services Feasibility Study presented four runway options which explored infrastructure requirements for different runway lengths and for instrument and non-instrument procedures.

Option	Descriptor	Comments
Option A	771m Code 1C Non-instrument Approach	Complies with CAP168 requirements for Non-Instrument Runway only.
Option B	900m Code 2C Non-instrument Approach	Complies with CAP168 requirements for Non-Instrument Runway only.
Option C	1035m Code 2C Instrument Precision Approach	Complies with CAP168 requirements for a Precision Instrumented Runway but with minimum mandatory RESA's.
Option D	950m Code 2C Instrument Precision Approach	Complies with CAP168 requirements for a Precision Instrumented Runway but with recommended length RESA's.

Table 3.1 – 2013 Study Runway Options

- The Code description for each runway option refers to the runway classification in CAP168. Code 1 runways are where the greater of the TODA[1] or ASDA[2] are less than 800m. A Code 2 runway is where these dimensions are between 800m and 1199m. The letter in the Code reference is primarily a reflection on the maximum wing span of the intended aircraft. A Code C runway is for aircraft with wingspan width less than 36m.
- In practice it is likely that only Code A or B aircraft would operate at Broadford and the sizes of aircraft stands and other facilities in the previous study had been sized for these smaller aircraft only.
- At the time of the 2013 study, which was before the publication of CAP1122, Options A and B were on the basis of being suitable for visual approach procedures only. However, the study did note that it was likely that GNSS advances meant that RNAV IAPs were likely to be adopted in the near to mid-term.
- Given the terrain around Broadford it was considered unlikely that airlines would be prepared to commit to operate into the airfield if the base-cloud was below 1000ft above ground level (AGL) (it should be noted that pilots with first-hand experience operating in the area, and using an over-sea approach routing may be prepared to approach the airfield with cloud cover at significantly lower levels than this, but it is unlikely that operators would be prepared to rely on this in considering the commercial viability of the service).
- Given this, the 2013 study considered that operational reliability would be significantly detrimental to the commercial viability of operating services and to attracting an operator to run services at a competitive market rate.

Impact of CAP1122

- The application of CAP1122 criteria opens up the possibility of further airfield design and procedure options to be explored. These range from 'Minimum Infrastructure Change' to the runway to a fully compliant Precision Instrument Runway and options in between.
- Under the risk-based policy now permitted under CAP1122, a good safety argument should be able to be marshalled for not having to adopt all the prescriptive criteria required for a fully compliant Precision or Non-precision Instrument runway, but still achieve significant benefit in terms of approach minima.

3. Airfield Infrastructure

3.1 Context

- Table 3.2 provides an indication of our view of the likely infrastructure requirements to achieve different minima levels. In broad terms, it is likely that an airfield which is fully compliant with CAP168 requirements for precision instrument approaches and with RNAV including vertical guidance procedures (LPV) might achieve a minima of around 250ft. Whereas an airfield compliant only with the CAP168 requirements for visual approaches might achieve a minima of 500-600ft with RNAV.
- The estimated minima in Table 3.2 are based on our professional judgement. A full risk assessment along with detailed design of the IAP criteria taking into consideration local topographical conditions and discussions with the CAA would be need to confirm these assumptions.
- Data provided by HITRANS based on daily observations indicates that cloud base levels below 500ft were recorded at Skye on 33 days in 2015 (measured as 3/8ths cloud base which is the convention when assessing approach minima). These observations were made at a specific time of day so provide a limited insight, but if this single year data is representative of a long term pattern then it is likely that an experienced operator would consider that, if approved procedures for a 500ft minima were in place, acceptable levels of reliability in the prevailing visibility and cloud cover conditions could be achieved. This opinion would need to be confirmed through discussions with potential operators at a later stage should proposals be progressed at Broadford.

Requirement	Lower	Medium	Full	Remarks
Aerodrome Licence	Yes	Yes	Yes	Mandatory for Commercial Air Transport (CAT) Ops. EASA Licence standard recommended
Safety Management System	Yes	Yes	Yes	Mandatory for CAT Ops.
Runway Code	Non-instrument	Instrument Non-precision	Instrument Non-Precision	
Runway width	≥23m for Code 1 ≥30m for Code 2	≥23m for Code 1 ≥30m for Code 2	≥23m for Code 1 ≥30m for Code 2	In accordance with CAP168
Strip width	±30m for Code 1 ±40m for Code 2	>±30m ≤±75m	±75m for Code 2	Assumes argument can be made for reduced strip width
RESA length	Nil	≤90m	120m	CAA increasingly keen on RESAs.
Aerodrome Flight Information Services (AFIS)	Yes	Yes	Yes	Minimum level of Service Required for Instrument Flight Rules Ops
Possible Achievable Minima with LNAV only	~ ≥5/600ft	~ 350/450ft	~ ≥350ft	Estimate only, subject to Risk based assessment
Possible Achievable Minima with LPV + LNAV	~ ≥5/600ft	~ 350/450ft	~ ≥250ft	Estimate only, subject to Risk based assessment

Table 3.2 Relationship between infrastructure provision and operating minima

3. Airfield Infrastructure

3.2 Runway Options

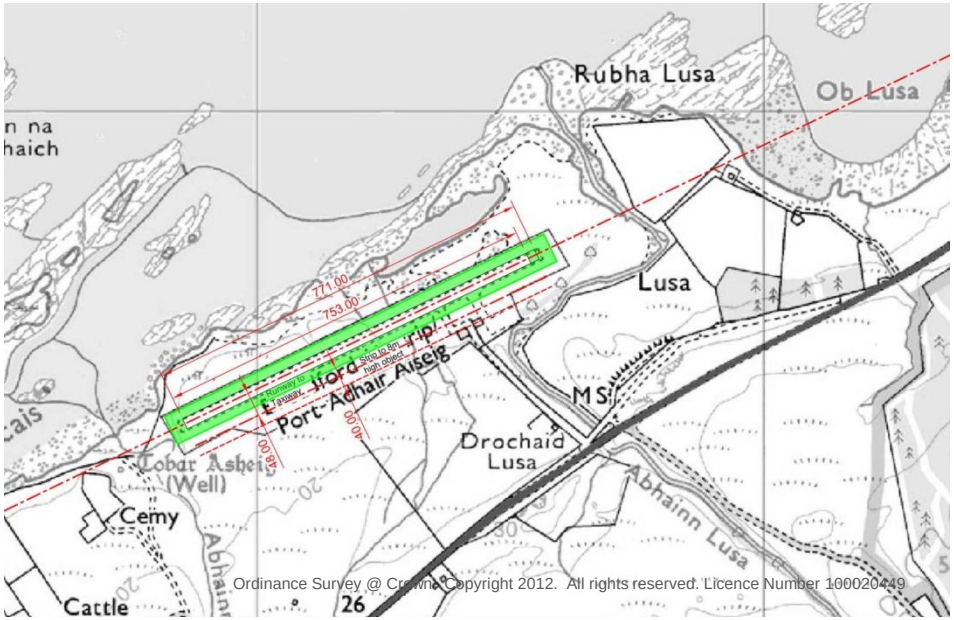
2016 Study Airfield Infrastructure Options

- The four options considered in the 2013 study require a initial Capex investment of between £4.1m - £5.0m for Option A to £15.6m - £19.1m for Option D in 2016 prices. Details of the build up of these costs are included in the Appendix.
- The Client Steering Group has concluded that Options B-D are not currently affordable based on these updated cost estimates and considering the benefits they deliver.
- The focus of this 2016 Business Case Study is therefore two variants of Option A:
  - Option A.1 is based on the same 771m Code 1B airfield layout as considered in the previous study, but the terminal, apron and other associated facilities are sized to accommodate 9-seater (or with CAA approval a 13 seat) aircraft only.
  - Option A.2 is similar to Option A.1 but has facilities sized to accommodate 19-seater aircraft.
- For each of these options we have reviewed the 2013 airfield infrastructure Option A proposal in light of CAP1122 and included associated facilities needed for RNAV procedures. It is anticipated that, with approval of RNAV procedures secured, each might achieve a minima of ~500/600ft, which is considered likely to be sufficient to attract an airline to operate appropriately reliable services to the aerodrome.
- Although the other 2013 options have been discounted for this 2016 study, it is worth noting that both Option A.1 and A.2 could be incrementally expanded at a future year after opening to achieve any of the Options B-D should a supportable business case arise. Careful planning in the detailed development of the plans for the first stage development should ensure that later incremental development can happen without significant abortive costs.

3. Airfield Infrastructure

3.2 Runway Options - Option A.1 and A.2

- Both option variants are based on the existing airstrip with a 771m x 23m paved runway suitable for non-instrument approaches by Code B aircraft.
- The declared distances are:
  - Rwy 07 TORA: 771m LDA 771m
  - Rwy 24 TORA: 771m LDA 753m
- The green shaded area surrounding the runway represents the runway strip which in CAP168 for a Code 1 Non-Instrument runway is 60m wide. This area is graded at the same level as the runway and free from obstructions. It is designed to limit damage to aircraft running off the runway or flying over it during landing or takeoff manoeuvres.
- No RESA's (runway end safety areas) are provided.
- Much of the existing apron would not be available for use due to the transition slope clearance requirements which requires clear zones to be maintained along the length of the runway. New apron areas have therefore assumed to be needed.
- A limited amount of landscape clearance is likely to be required to clear the transition slope obstacle clearance zones.
- No significant earthworks are likely to be needed except for the construction of a new terminal and apron. The terminal will include facilities and equipment for Aerodrome Flight Information Services (AFIS) to be provided at the airport.
- Airfield ground lighting will be upgraded to the standard of a Non-Precision Instrumented runway. This will allow night time operations and safer, more reliable operations in poorer weather conditions down to the minima specified in the RNAV IAP procedures.



- *It is considered that it may be possible for the CAA to permit the use of RNAV IAPs down to cloud-base minima of 500-600ft (LVP and LNAV) agl for an aerodrome of this configuration.*

- Visual inspection of the runway by AECOM in August 2016 indicates that a bituminous overlay will be required to refurbish the existing runway, taxiway and apron areas within the next two years.

3. Airfield Infrastructure

3.3 Aircraft Payload

- Using aircraft manufacturers' data, an analysis of the capability to operate different aircraft on the existing runway has been undertaken.
- An assessment has been made of whether the different aircraft types can carry their maximum payloads on each runway option, or if it is possible with a payload restriction.
- The analysis considers the requirements of aircraft under wet conditions (which is more onerous than dry) and the take-off and landing length requirements calculated separately. The allowable payload is the lowest of the calculated percentages.
- For departing aircraft, it is assumed that only enough fuel is carried for the safe trip with a contingency to Glasgow Airports. Arriving aircraft are assumed to carry sufficient fuel for the return journey so refuelling at Broadford is not necessary.
- The adjacent table summarises this analysis, with the figures relating to the percentage of payload that can be carried by each aircraft type. The results of this analysis are inputs into the traffic forecast analysis and associated operating cost analysis.
- In overall terms, the Islander, Trislander and Grand Caravan can all operate without payload restrictions. The Twin Otter variants both have modest payload constraints but it is likely that the significant majority of the 19 seat capacity could be used depending on other cargo on board.
- The performance of the Let 410 is such that payload will be significantly restricted. The Czech manufacturer of the aircraft have undertaken analysis specifically for this study which assess the maximum payload in wet conditions as approximately 700kg equating to 8-9 passengers. A BCR assessment for this aircraft has therefore not been developed.

Option	Aircraft which can operate to GLA without payload restrictions	Aircraft which can operate to GLA with restrictions to maximum payload (max payload %)
Option A.1 & A.2	Islander BN-2B-20 Islander BN-2B-26 Trislander BN-2A MkIII Cessna 208B (Grand Caravan)	Bombardier DHC-6 300 Twin Otter (80-85%) Bombardier DHC-6 400 Twin Otter (90-95%) Let 410 (40 – 45%)

Table 3.3 Payload Restrictions

3. Airfield Infrastructure

3.4 CAPEX

CAPEX Update.

- The CAPEX estimates for each of the options from the 2013 study have been reviewed and updated to reflect cost inflation. CAPEX estimates for Option A.1 and A.2 are presented in this chapter and Options B-D are included in the Appendix.
- In broad terms, the base costs are approximately 25% higher than those reported in 2013 due to changes in construction costs over the period since the earlier study. The estimates have been based on those derived in 2013 but with unit rates adjusted to align with 2nd Quarter 2016.
- By way of reference, the RICS (Royal Institute of Chartered Surveys) have calculated that on average in Scotland tender prices for construction works have increased by 32% between 4th Quarter 2012 and 1st Quarter 2016. We have reviewed rates against other data from work elsewhere in the UK and considered regional adjustments in order to sense check the 2016 estimates.
- Condition inspections carried out by AECOM have also concluded that an overlay will be required in the near future to refurbish the runway and taxiways surfaces. This has added approximately £700k (+contingencies) to the 2013 costs.

Costs Summary

- Option A.1 represents the minimum capital investment needed to the existing airfield to accommodate 9-seater aircraft with RNAV and is estimated to be approximately £3.3m to £4.0m.
- Option A.2 represents the minimum capital investment needed to the existing airfield to accommodate 19-seater aircraft with RNAV and is estimated to be approximately £4.1m to £5.0m.
- A breakdown of these costs is provided

Option A.1

- This option includes the construction of :
  - 400sqm terminal permanent building fitted out to a basic standard of functionality and quality
  - 1,500 sqm of new apron and taxiway to accommodate two 9-seater aircraft
  - Upgraded airfield ground lighting to meet CAP168 Scale L3
  - 50 space car park, and minor upgrades to access road junction
  - A single Cat 3a standard RFFS vehicle with garaging facility, storage and basic non-residential staff facilities
- Minimum allowances of £20-30k have been included for upgrades to each of the existing airfield instruments and equipment (radio, meteorological equipment etc)
- A small allowance has been included for upgrading the boundary fence to prevent stray animals entering the airfield. It is assumed that full security fencing to protect the airfield from unauthorised persons entering is not required but this will need to be discussed with DfT.
- No hangar has been included. If airlines are to base aircraft overnight at the airfield then they may require this to be provided. A fuel bowser is included in a secure enclosure for unplanned refuelling only.
- This estimate is considered to represent the minimum reasonable level of investment that might be required subject to successful discussions with the CAA, DfT, the potential airline operators and Fire Authorities. If these third parties do not accept the safety risk assessment arguments which will need to be developed to support this, then additional investment would be needed to gain an operating licence with the operating minima assumed.
- It is possible that the terminal costs could be reduces modestly if a temporary or prefabricated modular building is considered as has been used for the recent Inverness Airport extension. Further small cost savings may be possible if used fire equipment is made available from sources such as from one of HIAL's existing airports.

3.4 CAPEX

Option A.2

- This option includes the construction of :
  - 720sqm terminal building fitted out to a basic standard of functionality and quality
  - 2,000sqm of new apron and taxiway to accommodate two Twin Otter aircraft
  - Upgraded airfield ground lighting to meet CAP168 Scale L3
  - 100 space car park, and minor upgrades to access road junction
  - A single Cat 3a standard RFFS vehicle with garaging facility, storage and basic non-residential staff facilities
- Minimum allowances of £20-30k have been included for upgrades to each of the existing runway lighting systems and instruments and equipment (radio, meteorological equipment etc)
- A small allowance has been included for upgrading the boundary fence to prevent stray animals entering the airfield. It is assumed that full security fencing to protect the airfield from unauthorised persons entering is not required but this will need to be discussed with DfT.
- No hangar has been included. If airlines are to base aircraft overnight at the airfield then they may require this to be provided. A fuel bowser is included in a secure enclosure for unplanned refuelling only.
- This estimate is considered to represent the minimum level of investment that might be required subject to successful discussions with the CAA, DfT, the potential airline operators and Fire Authorities. If these third parties do not accept the safety risk assessment arguments which will need to be developed to support this, then significant additional investment would be needed to gain an operating licence with the operating minima assumed.

3. Airfield Infrastructure

3.4 CAPEX

Option A – cost estimated in 2016 prices	Option A.1	Option A.2
Earthworks, drainage and vegetation removal	£5-6k	£5-6k
Runway and existing apron refurbishment	£580-700k	£580-700k
New apron and taxiway (including mixing plant)	£320-390k	£370-450k
Runway extension and widening	-	-
Culverts and structures	-	-
Runway, apron and approach lighting and marking	£385-470k	£385-470k
Upgrade to radio, signage, meteorological equipment and windsock	£30-35k	£30-35k
New terminal building	£540-660k	£970-1,190k
Car parking and road junction upgrade	£125-240k	£155-240k
Rescue and Fire Fighting Service Facilities	£110-135k	£110-135k
Boundary fence upgrade	£30-35k	£30-35k
Hangar, fuel bowser	£30-35k	£30-35k
Preliminaries @ 18%	£380-470k	£480-590k
Sub-total	**£2,510-3,070k**	**£3,160-3,870k**
Contingencies @ 20%	£500-610k	£630-770k
Professional Fees @10%	£250-310k	£320-390k
Total	**£3,270-4,000k**	**£4,110-5,030k**

Table 3.4 CAPEX Costs

3. Airfield Infrastructure

3.5 Operating and Maintenance Costs

- Order of magnitude O&M costs have been estimated for each of the options based on high level benchmarking and rule-of-thumb rates from comparable airports.
- Average annual maintenance costs are based on 2.5% or the asset replacement cost and are deemed to include cleaning, on-going minor repairs and decoration, consumables and airfield maintenance. Replacement costs of equipment, and renovation and upgrades of the airfield and terminal facility are not included.
- Staff related costs cover the airport management, security and fire fighting teams. Baggage handling and aircraft ground servicing arenot included and assumed to be airline cost. Cleaning and estate maintenance staff costs are included in the maintenance costs.
- Staff related costs are based on:
  - 3 FTE airport management staff
  - 5 FTE fire fighting staff
  - 2 FTE security staff
  - An overhead of 60-90% to cover insurances, direct employment cost and other assigned central office overhead costs.
- These staffing levels are considered to be a reasonable minimum based on providing cover only during morning and afternoon operating periods and considered unlikely to be different for the two options.
- This staffing level compares to 9 operational staff at Barra, 12 operational staff at Campbelltown and 11 operational staff at Tiree.
- Power and utilities are based on benchmark rates for similar facilities.

Annual Costs £s In 2016 prices	Maintenance Costs	Staff Related Costs	Power & Utilities	Total Annual Costs
Option A.1	£120-140k	£320-380k	£30-35k	£460-560k
Option A.2	£140-160k	£320-380k	£30-35k	£480-580k

- It is difficult to make direct comparisons with the operating costs at other airports as the assignment of central office overheads and arrangements for part time operations for staff differ between airports.
- Notwithstanding this, in annual financial statements prepared by Highlands and Islands Airports Ltd for the periods between 2006 and 2010, the operating costs for Barra Airport were recorded as being between £650-700k per annum.
- Barra Airport is of a similar size to Option A.1 but has some significant differences, particularly the fact that aircraft land on the beach. However, the operating costs are of a similar order-of-magnitude.

4. Traffic Forecasts

4. Traffic Forecasts

4.1 Forecast background and methodology

Demand Drivers

- As with all air services, there are several main drivers behind demand for air travel at a macro-economic level. These include:
  - The population catchment size of the airport/service (with a larger population generally leading to greater traffic volumes);
  - The wealth of a region (with more wealthy regions generally leading to greater demand due to a higher level of disposable income to spend on air travel);
  - The alternative options for travel (with greater modal competition generally leading to fewer air passengers);
  - The cost of air services (and modal competitors), with cheaper air fares (especially in comparison to modal competitors) leading to greater stimulation in travel demand; and
  - Modal competitor travel times (with longer journeys by other modes generally making air travel a more attractive option, especially for business travel).
  - Medical travel demands, while not necessarily a demand driver from Skye, are considered within the model to account for increased demand from other HIAL airports.
- All these factors are relevant for air traffic demand within the Highlands of Scotland, particularly issues surrounding (the lack of) alternative transport modes and journey times (the two not necessarily being mutually exclusive).
- As always, the benefits to a person's journey from flying often need to be weighed against the disbenefits of (usually higher) cost, less freedom in terms of locality of end airport and actual origin/destination, additional stress of flying (such as security checks and potential delays/cancellations) and so on.

Forecast methodology overview

- As Skye has not had air services for a significant period of time (and over that time, substantial changes have occurred within the aviation industry), the forecast methodology that would normally be employed (in terms of assessing specific route performance from Skye and looking at traffic leakage to competitor airports) is not really appropriate.
- As a result, a bespoke benchmarking model has been constructed for the project, taking HIAL airport service performance, against the key demand drivers discussed left, as a starting point for assessing overall potential demand from Skye.
- This model assumes that, in general, the population on Skye does not act in any different way to the population in other Highland areas (taking into account the availability of other modes of transport and the remoteness of the region) when assessing their options for transport to/from the area. For example, if a resident from elsewhere in the Highlands were presented with the same travel options as someone on Skye, both residents would act in a similar way.
- Other research conducted by RDC Aviation into the travel habits of residents of different regions of the UK compared to others confirms this – essentially, members of the public act in the same way when deciding when, where and how they chose to travel.
- A macro-economic, multivariate model, based on the performance of air services from other benchmark airports and the demographics of these regions has been built. The same data has then been determined for Skye to give a benchmarked demand forecast for air services to/from Skye.

4. Traffic Forecasts

4.1 Forecast background and methodology

Forecast methodology overview – data sources

- The data collected to represent the demand drivers listed on the prior page are as follows:

  - **Population.** The most recent population data identified has been sourced form the Scottish Index of Multiple Deprivation (SIMD) on a Super Output Area (SOA) level. For island airports, the SOAs on that island have been chosen as being representative of the total island population. For mainland airports (Wick, Campbeltown and Skye), a review of drive-times from the airports has been undertaken, with SOAs which fall within these drive times being used as the population of the airport's catchment.

  - **Regional Wealth.** Again, data from the SIMD has been used to give a metric of economic wealth of each airport region. Typically, regional GVA would be used, but no data has been identified on a small island level. Therefore, the number of people within each SOA being classified as 'Income Deprived' has been used as a proxy for economic wealth (or deprivation).

  - **Alternative options for travel and demand on these modes.** To assess the total travel demand from each region, a review has been undertaken of traffic on alternative modes of transport. Passenger demand on ferry services to/from other Highland islands sourced from Transport for Scotland has been reviewed. In addition, traffic count data for vehicles passing over the A87 Skye Bridge have been sourced from Transport for Scotland to give some indication as to current travel demand to/from the Island. In addition, an average of the SIMD 'Geographical Access' index score has been taken as a proxy for how remote a region/island is.

Forecast methodology overview – data sources

  - **The cost of air transport, and cost and time of other modes of transport to/from Glasgow and Edinburgh.** The benchmarking analysis, along with the 2012 Skye Air Service online survey conducted has identified that Glasgow and Edinburgh would be the most likely options for air services to/from Skye. Therefore, travel costs on current air services from benchmark airports to/from Glasgow and Edinburgh (sourced from loganiar.com) have been used. In addition, the drive and ferry costs from each region to Glasgow and Edinburgh have been used (sourced from Google Maps and Calmac/NorthLink websites) as a guide of alternative travel costs.

  - **Outbound passengers.** To assess the origin of demand on current HIAL airport services (i.e. whether it is inbound to or outbound from the island/airport), an analysis has been undertaken on CAA Survey Data of Scottish Airports. This analysis looked at the stated home district of passengers on HIAL services from Glasgow and Edinburgh to give an overall percentage of demand which originates at the HIAL end.

  - **Medical Traffic.** Accurate data on passengers travelling for medical purposes on a route-by-route basis are unknown. However, previous research projects and studies have determined certain route-specific medical passengers, while others have measured approximate percentages too. The most appropriate route-level values for medical traffic have been included to account for the lack of this demand being within Skye traffic.

  - **Air passengers (dependent variable).** To correlate these factors against actual demand, 2015 passenger data from the HIAL benchmark airports has been sourced from the CAA. However, as a mainland service is most likely from Skye, only mainland passengers have been included (i.e. excluding passengers on intra-island routes).

4. Traffic Forecasts

4.1 Forecast background – Population

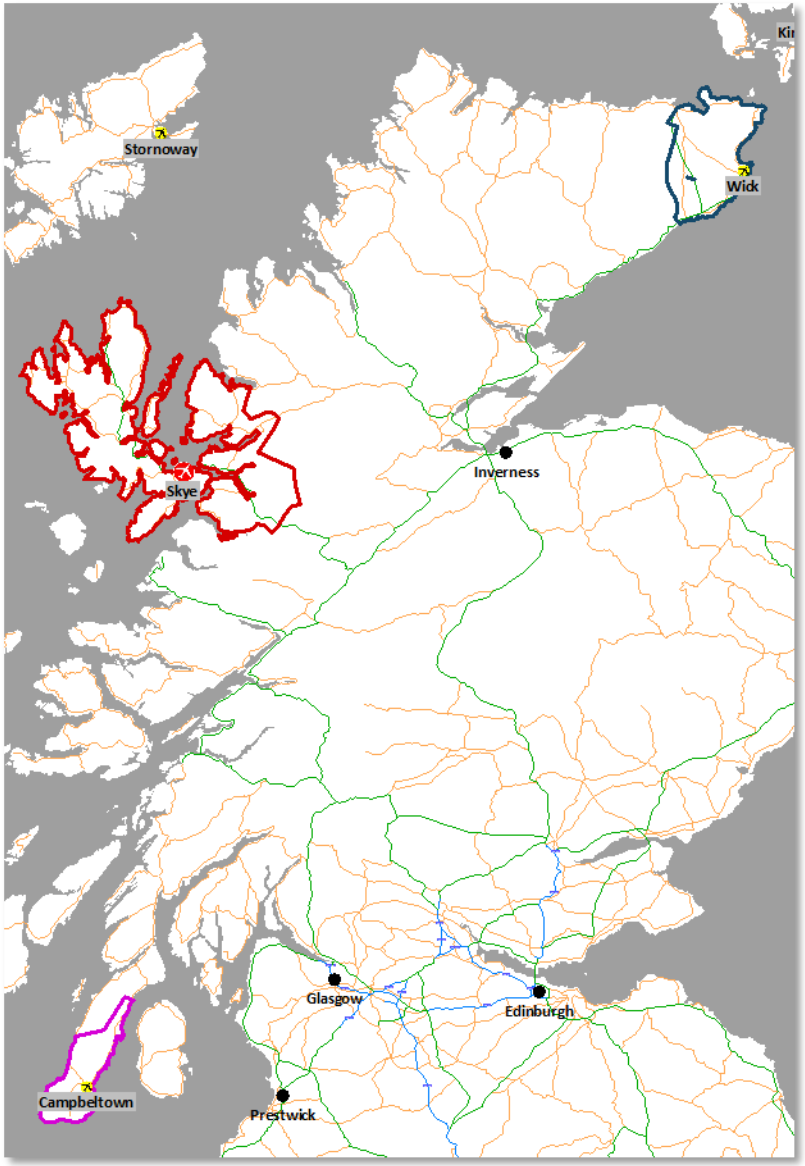
- Population catchments for each benchmark airport (and Skye) are shown below. For the island airports, the island's total population has been used.

- For airports with connections to the mainland (Wick, Campbeltown and Skye), a drive-time analysis has been undertaken, identifying the general area each airport serves. These catchments have then been restricted according to either competitor airports (in terms of Wick vs Inverness) or where driving to the airport would be counter-intuitive (e.g. residents in Argyll and Bute driving down to Campbeltown to catch a flight back north to Glasgow).

- Skye's catchment population sits within the middle of the two extremes of low population

Airport Catchment Populations
(Source: SIMD, 2014 Mid year estimates)

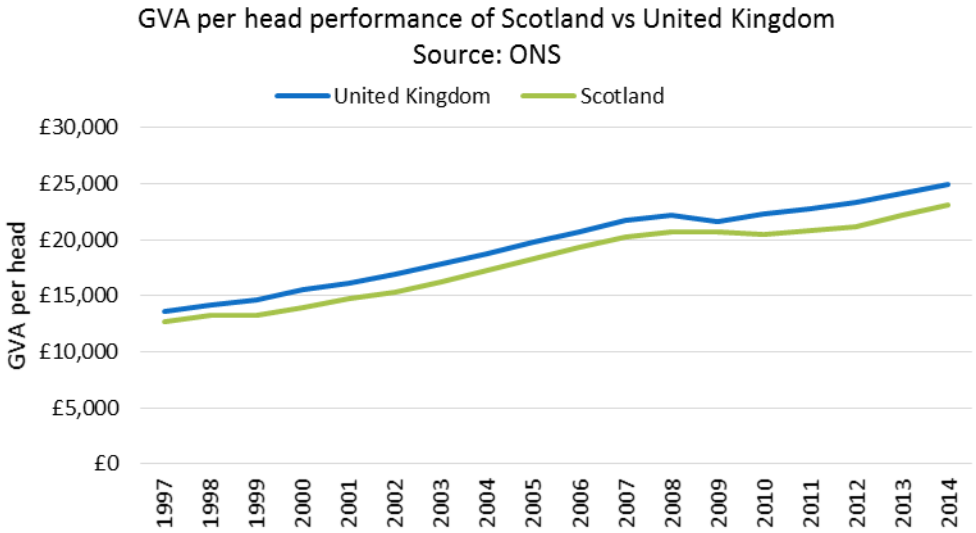
Airport	Population
Benbecula	3449
Barra	2542
Campbeltown	9459
Islay	4215
Kirkwall	21590
Sumburgh	23230
Stornoway	21259
Tiree	1925
Wick	25935
Skye	14527



4. Traffic Forecasts

4.1 Forecast background – Regional Wealth

- Over the last 20 years, the GVA per head of Scotland has performed strongly, being just under that of the UK as a whole (in 2014, Scotland's value stood at £23,102 per capita).
- GVA per head values are available down to a NUTS3 level, but this is insufficient to highlight the economic wealth of specific Highland airports of regions. Therefore, a different approach has been taken to highlight an airport's economic wealth.
- The Scottish Index of Multiple Deprivation dataset breaks Scotland down into over 6,000 Super Output Areas (SOA) with specific analysis provided for each area such as population, the ranking of deprivation for each SOA against others, and the number of income deprived people within each area. It is this latter value which has been taken as a proxy for economic wealth for each airport's catchment.
- Each airport's catchment SOA's have been identified and the number of income deprived people have been totalled. This is then converted into a percentage of the total catchment population.
- The table to the bottom right shows the percentage of people within each airport's catchment as being income deprived. In general, the greater the level of income deprivation, the less money people will have to spend on air fares, especially for discretionary travel, and should in theory result in less demand for air services.
- Skye's catchment has a lower than average level of income deprivation than the surrounding areas and therefore, other things being equal, Syke should have at least a similar demand for air travel, if not greater.



Airport Catchment Income Deprivation
(Source: SIMD, 2014 Mid year estimates)

Airport	% Population Income Deprived
Benbecula	9%
Barra	12%
Campbeltown	14%
Islay	9%
Kirkwall	7%
Sumburgh	6%
Stornoway	13%
Tiree	8%
Wick	12%
Skye	9%

4. Traffic Forecasts

4.1 Forecast background – Cost Elasticities

- As part of this study, an overview is provided of studies which have been conducted into price elasticities to provide some context over the potential impact on demand from increasing, or decreasing fares. Typically, price elasticities come into effect when they represent a change against an existing fare, with an elasticity of -1.5 resulting in a suppression of demand of 1.5% if fares increased by 1% (for example).

- This section looks at two key studies which have looked at cost elasticities in detail:
  - North American studies undertaken on behalf of the Canadian Government by Gillen et al in 2003.
  - A wide-ranging global study carried out for IATA by Intervistas in 2007.

- In addition, a summary of elasticities from two more local studies are provided:
  - UK focused investigations of the elasticity issue reported by the CAA in 2005.
  - Detailed work on the subject underpinning the UK Department for Transport's latest national passenger forecasts published in 2013.

- Each of these independent studies combines its own literature review with econometric analysis of trends in income, fares and passenger numbers, and therefore between them enable a comprehensive overview of the issue. Gillen and Intervistas provide international empirical evidence; the CAA and DfT's work focuses on the UK aviation market.

4. Traffic Forecasts

4.1 Forecast background – Cost Elasticities

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

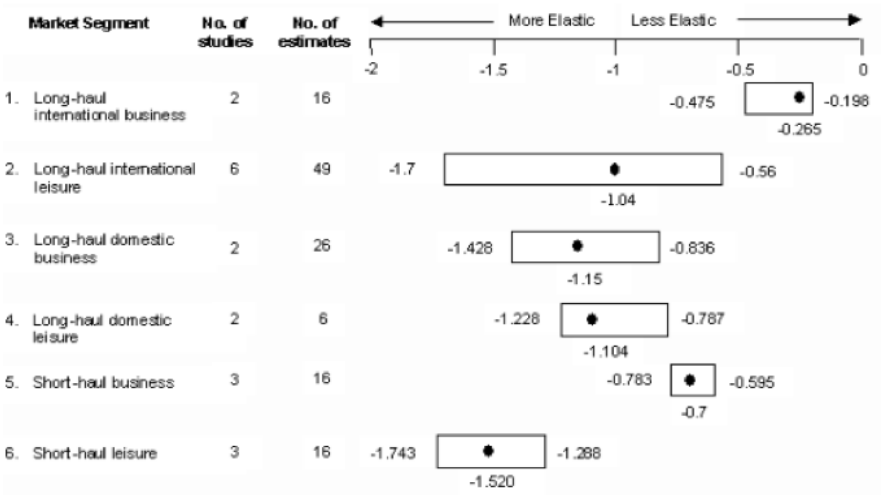
- The comprehensive review of existing studies undertaken by Gillen et al for the Canadian Department of Finance in 2003 provides a seminal comparative evaluation of the elasticity of air travel available from the academic literature. They collected 254 *own-price elasticity* estimates from 21 empirical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

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

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

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

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



4. Traffic Forecasts

4.1 Forecast background – Cost Elasticities

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

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

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

- There is a significant demand response to changes in air fares, with increased air fares leading to lower passenger demand. The uniformity and consistency of this result indicates strongly that any policy action that results in higher fares (e.g. taxes, increased landing fees) will result in a decline in demand. But the scale of this decline in demand will depend on a number of factors:
  - Business/leisure mix - business travellers are less sensitive to fare changes (less elastic) than leisure travellers because they generally have less flexibility to postpone or cancel their travel than leisure travellers
  - Short-haul vs. long-haul route structure - fare elasticities on short-haul routes are generally higher than on long-haul routes, reflecting the opportunity for inter-modal substitution on short-haul routes (e.g. travellers can switch to rail or car in response to air fare increases)

- Some studies also reviewed by Intervistas supported the idea that the demand elasticity faced by individual air carriers is higher than that faced by the whole market. For example, Oum, Zhang and Zhang (1993) estimated airline network elasticities in the U.S. and found values ranging from -1.24 to -2.34, while studies estimating market or route elasticities ranged from -0.6 to -1.8. In contrast, Alperovich and Machnes (1994) and Njegovan (2006) used national-level measures of air travel in Israel and the UK respectively and produced even lower elasticity values (-0.27 and -0.7, respectively).

- A summary of the potential range of elasticities identified in the Intervistas study is provided in the table below:

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

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

4. Traffic Forecasts

4.1 Forecast background – Cost Elasticities

CAA Elasticities Study 2005

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

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

Elasticities in DfT's 2013 Air Passenger Forecasts

- The table below provides a summary of the estimated long run elasticities (for both income and price) of air passenger demand that were used by the DfT in 2013:

Table 2.1: Long run price and income elasticities of UK terminal passenger demand

		Elasticity of demand with respect to	
Sector	**Share of passenger demand in base**	**Income**	**Air fares**
UK Business	8%	1.2	-0.2
UK Leisure	45%	1.4	-0.7
Foreign Business	7%	1.0	-0.2
Foreign Leisure	14%	1.0	-0.6
International to international interliners	10%	0.5	-0.7
Domestic	15%	1.7	-0.5
Overall	100%	1.3	-0.6

Notes:
Income variable depends on sector.
Price and income elasticities are point estimates.
Results are elasticity of terminal passengers to income or fares.

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

Elasticity summaries

- The studies show a range of cost elasticities according to journey type. DfT values, while the most appropriate, seem significantly lower than other studies and indeed against the CAA's values of -0.5 and -1.3 for business and leisure respectively. The CAA figures match much more closely with those from the Gillen et al study for short-haul services (-0.7 and -1.5 median values).
- Therefore, taking average values of the CAA and Gillen et al studies would be the most robust, giving elasticities of **-0.6 and -1.4 for business and leisure traffic** respectively.
- These elasticities are built into the long-term forecast and are only applicable when considering fare variations from one period to the next.

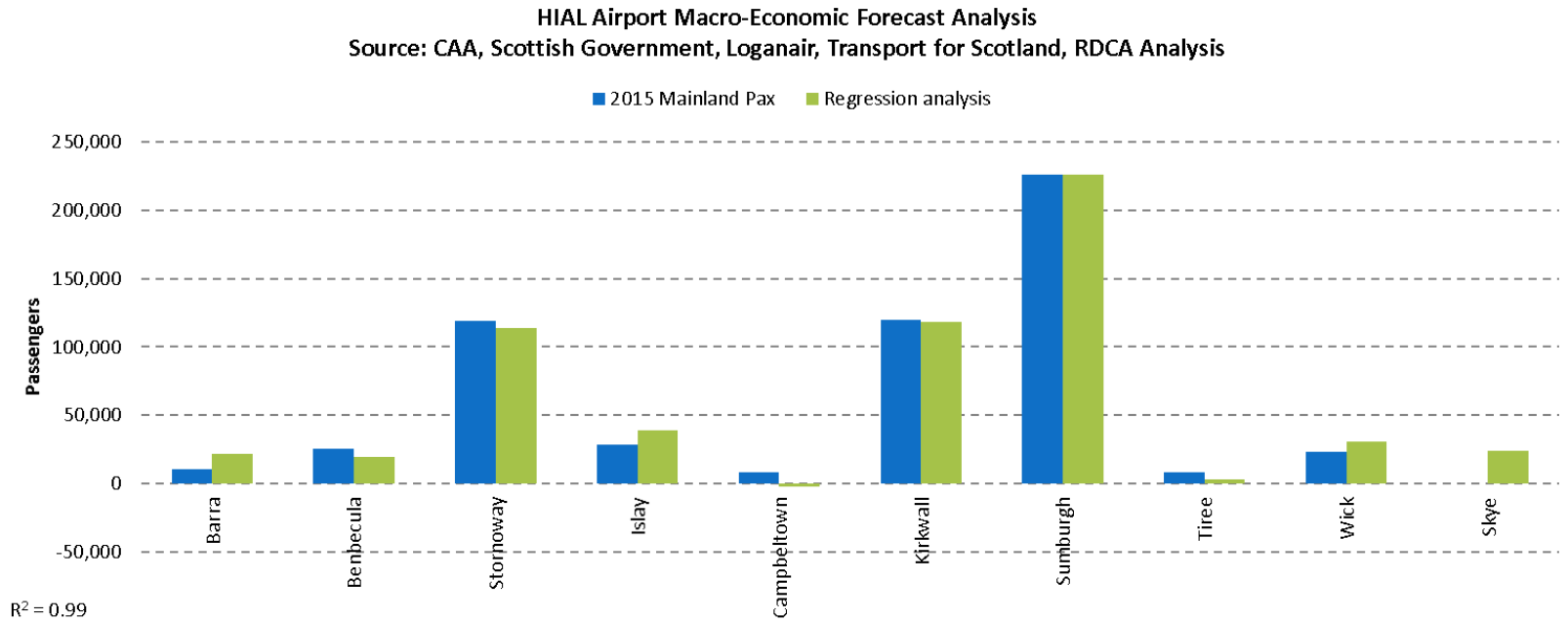
4. Traffic Forecasts

4.2 Forecast outputs and sensitivities

Forecast methodology overview – macroeconomic analysis

- When undertaking a multi-variate regression analysis on the independent variables discussed on the prior page, there is a very strong correlation against total mainland passengers being carried, with an R^2 value of 0.99. The average variance of the regression analysis against actual outturn is ±6%. However, this is skewed to the larger airports with the regression overestimating the smaller airports such as Barra, Islay and Wick by an average of +15%.

- When the independent variables for Skye are input into the model, the regression analysis after adjusting the overestimation shows an overall unconstrained demand of **23,799 passengers**.

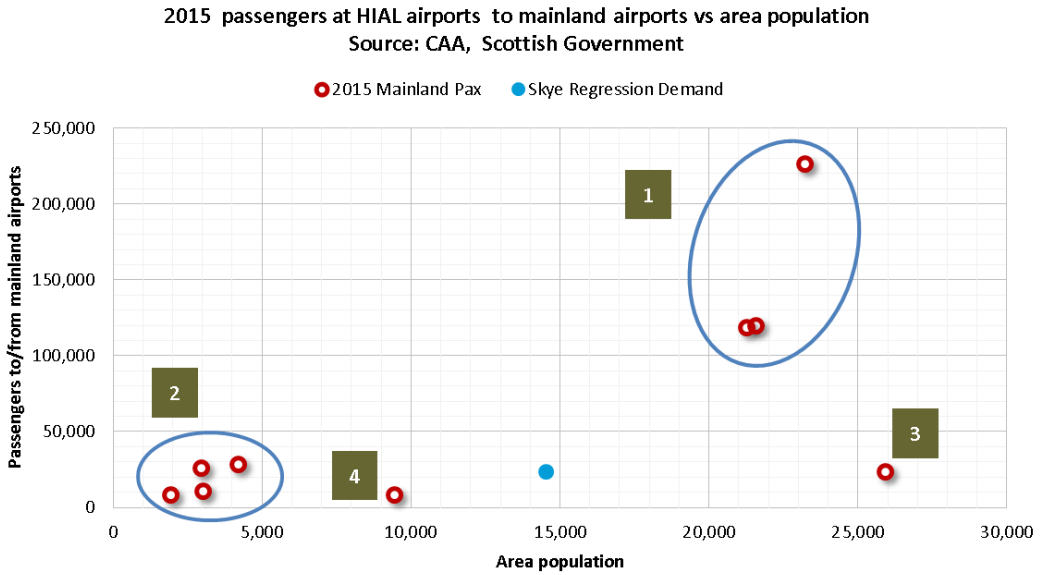


4.2 Forecast outputs

Skye unconstrained demand forecast – comparison against other airports

- Comparing the regression forecast for unconstrained air service demand from Skye against mainland passengers at other airports (and each airport's population), the unconstrained demand fits well in comparison to the mainland demand for airports at the lower end of the population scale.

- Four groups/airports have been highlighted:
  - Group 1: Stornoway, Kirkwall and Sumburgh. These airports serve the most remote island regions from within the benchmark group and residents therefore could be expected to have a significantly higher propensity to fly.
  - Group 2: Tiree, Barra, Benbecula and Islay. These airports are the most comparable to Skye in terms of westerly location in the Highlands.
  - Airport 3: Wick. Wick faces competition from Inverness Airport (the only airport to really have a competitor within the benchmark group). Therefore, traffic could be expected to be lower as a result.
  - Airport 4: Campbeltown. Campbeltown has the shortest drive time and cost to Glasgow airport (being around 3.5 hours). This drive time is typically the point at which driving becomes a competitor against air travel once check-in, security process and journey time at the destination end, are taken into account. Therefore again we could expect Campbeltown to sit lower in terms of demand vs population.



4. Traffic Forecasts

4.2 Forecast outputs and sensitivities

Skye unconstrained demand forecast – propensity to fly (PTF) comparisons

- The percentage of outbound traffic from the benchmark airports group varies according to airport and route. 2013 CAA Survey Data from Edinburgh and Glasgow has been reviewed to identify the home address location of passengers on each HIAL route.

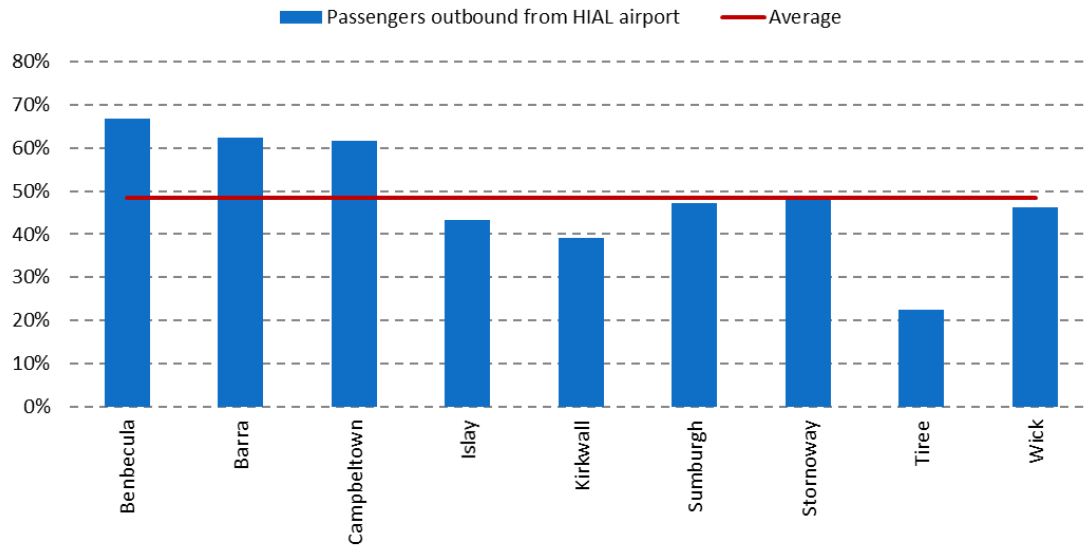
- Mainland airports (Wick and Campbeltown) have between 46% and 62% of traffic outbound from the regions to Edinburgh/Glasgow, while the HIAL group as a whole has an average of 49% outbound. Only Tiree varies from the average significantly (with only 22% of traffic outbound to Glasgow).

- Taking the average of 49% as the potential outbound traffic from Skye, this implies that, of the 23,799 passengers forecast, just over 11,600 would be Skye residents, giving approximately 0.4 trips per capita (with two passengers representing one trip and based on the catchment population of 14,527).

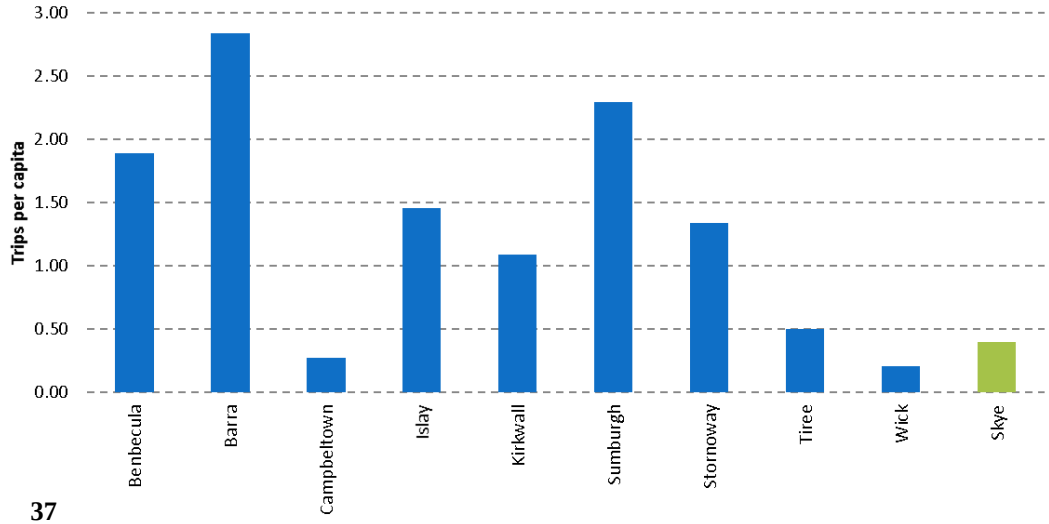
- Compared to the benchmark group, the number of outbound trips per capita from Skye is higher than the other mainland HIAL airports (Wick and Campbeltown). As discussed, Wick and Campbeltown could be expected to have a lower PTF due to competition from Inverness and shorter drive times respectively.

- The island airports have a substantially higher PTF, which would be expected due to the reliance these communities place on air services due to limited alternative travel options.

Percent of traffic outbound from HIAL airports to either Glasgow or Edinburgh
Source: CAA



Outbound trips per capita to Glasgow/Edinbugh airport
Source: CAA, Scottish Government, RDCA Analysis



4.3 Commercial analysis of service

Potential Aircraft Types

- As part of the infrastructure review, a range of turbo-prop aircraft were reviewed as to their operational capability at Skye (across the three potential infrastructure development options). The initial starting position was all commonly (and currently) used turbo-prop aircraft used by airlines in Europe. However, of these aircraft types, some have not been in production for some time and therefore are likely to be phased out of operation. In addition, some aircraft within this list have poor safety records and would therefore not be considered for operation.

- After an initial review of the airlines which operate the aircraft types, 20 aircraft variants were analysed in detail to assess their performance for using Skye. The main aircraft types and manufacturers considered are:
  - Bombardier
    - DHC6-300 (Twin Otter)
    - DHC8-300
  - ATR
    - ATR42-500
  - Saab
    - 340
  - Dornier
    - Do228
    - Do328
  - Britten-Norman
    - BN-2B Islander
    - BN-2A Trislander
  - Beechcraft
    - 1900
  - BAe
    - Jetstream 31/32
    - Jetstream 41

Potential Aircraft Types

- The typical internal configuration of these aircraft types ranges from 9 seats to 50 seats and mainly operating with 2 engines (the exception being the Trislander with 3). Maximum Take Off Weights (MTOWs) of the aircraft range from 2.99 tonnes through to 19.5 tonnes (for the DHC8-300).

- The runway options (including location, runway lengths, typical air temperature etc) have then been assessed against these aircraft variants to see if a) they could actually operate from Skye given the operating environment and b) if so, what payload restrictions (if any) they would be subject to due to landing or take off distances available.

- Through this process of identification and elimination of typical aircraft which could operate from Skye, the following have been identified as being the most probable aircraft which could be used commercially to operate to/from Skye without major payload restrictions or significant improvements having to be made to the airfield:
  - DHC6-300 (Twin Otter)
  - Dornier Do228-212
  - Britten-Norman BN-2B-26 Islander
  - Britten-Norman BN-2A Mk III Trislander

- There are no known aircraft planned for production which would revolutionise the sub-50 seat aircraft market. The most recent development has been the re-introduction of the DHC6-400 – a new version of the Twin Otter, which started production in 2010. The aircraft has the same seat capacity as the older DHC6-300, though different engines may have improved its performance. Being a newer aircraft, ownership costs will be higher than the DHC6-300.

4.3 Commercial analysis of service

Additional Aircraft Types – Let-410

- In updating the forecast for the proposed air services, RDC has added two additional aircraft types, the Let L-410 Turbolet ("Let-410") and Cessna 208B "Grand Caravan".
- The Let-410 is a 19-seat aircraft manufactured by Let Kunovice in the Czech Republic. The type has been popular since the 1970s in operating from challenging airstrips (e.g. short runway, unpaved or high altitude).
- The type is currently in very limited use in Western Europe.
- In the UK, the only commercial passenger operator is a small airline operating under the name "Citywing", flying very limited services from the Isle of Man to Belfast, Blackpool, Glasgow and Gloucester. However Citywing is a "virtual airline" and their aircraft are wholly owned and operated by the Czech airline Van Air Europe. The airline was recently successful in its application for the UK Regional Air Connectivity Fund to operate 12x weekly route between Derry and Dublin.
- There is also a freight and general charter operator, Ben Air headquartered in Denmark operating scheduled mail services within Scotland from Aberdeen and Inverness using Let-410 aircraft on behalf of Royal Mail.
- In late 2017 the improved Let-410NG (Next Generation) is set to enter service. This is due to feature new engines, increased range and luggage space. While it is plausible that the type could be selected by a UK airline, we do not see one single operator as an obvious candidate aside from Citywing/Van Air Europe.
- Let Kunovice has analysed that the aircraft operation from Skye to Glasgow would have payload restriction of a maximum 9 passengers.

Source: jerseyeveningpost.com

4.3 Commercial analysis of service

Cessna Grand Caravan

- The Cessna 208B “Grand Caravan” is an improved and expanded version of the popular Cessna 208 Caravan. It is designed to offer competitive economics on commuter routes where demand is relatively low.
- Currently, the use of single-engine aircraft such as the Grand Caravan on scheduled routes is very challenging under European legislation. This states that single-engine aircraft (such as the Grand Caravan) cannot be flown either at night or in conditions of poor visibility at flying heights (i.e. cloud cover). Given that North-Western Scotland has relatively low daylight hours in winter and an unsettled Atlantic weather system, this makes operating the Grand Caravan from Skye unfeasible without special dispensation.
- In Scotland, Loch Lomond Seaplanes operates non-scheduled scenic lake tour flights using Cessna 208 Caravan aircraft(Amphibian type) out of Loch Lomond and Trossachs National Park. It also offer scenic flight tours around Isle of Skye.
- In November 2015, the European Aviation Safety Agency (EASA) published Opinion 06/2015 in which it advised that such rules be eased to allow regional routes to operate on single-engine aircraft. This was submitted to the European Commission to advance the decision-making process, but no further outputs have yet been seen. The earliest that an approval decision could happen is in June 2016 with implementation possibly by 2017.
- Once such rules were to be relaxed, then it is plausible that the Grand Caravan could be an aircraft type operated on Scottish Highland services. The use of one engine will almost always provide better operating economics than two, and engine reliability has reached such a point that the risk of engine-failure is not a serious concern. However, the Grand Caravan has smaller seating capacity of typically 9-13 passengers compared to 19 passengers for the Twin Otter or Let-410.

- Not many airlines use the maximum configuration of 13 seats since it considerably reduces comfort. Furthermore, in the United States, the only market in which the 208GC has a significant presence, to carry more than nine passengers requires a waiver of ‘FAR (Federal Aviation Regulation) part 23’ – which usually stipulates the maximum capacity of the aircraft as 9 passengers. Considering that passenger single-engine operations would already require an exemption of EASA’s rules, a nine passenger aircraft would more likely to be accepted for this service than a thirteen passenger fully-loaded aircraft. However, a thirteen passenger operation is not beyond the realms of possibility and is used within our commercial analysis given the comparable seat comfort level to 19-seater aircraft.

Source: Loch Lomond Seaplanes

4. Traffic Forecasts

4.3 Commercial analysis of Skye-Glasgow service

Typical aircraft capacity and frequency of operation

- The starting point for assessing the potential constraints of aircraft/runway option is to assess the unconstrained demand forecast against the annual operational capacity.
- The 2012 online survey indicated that if a service was operated less than twice daily, people's use of the service may start to drop. The most common reasons given for a change in usage for a less than double daily service were the inability to complete a day's return for their journey and also the restriction that a single-daily service could place on the number, and range, of connections possible at the end airport.
- In addition, at least 75% of respondents stated they would be likely or very likely to use services on each day of the week. While midweek stated demand was lower than Friday/Monday services, there was still an obvious preference for services to be operated throughout the week.
- As with other HIAL services though, a reduced operation on weekends has been considered, at least initially while the service is immature. Therefore, in terms of overall operational capacity, a minimum double daily weekday service and single daily weekend service has been considered (equivalent to 12x weekly services).
- Of the six main aircraft types (used within the model), all have a typical maximum configuration of 17-19 passenger seats, with the exception of the Islander and Grand Caravan, with maximum 9 and 13 passenger seats respectively. To understand the suitability of these different capacity aircraft based on a fair comparison, we have considered the service specification in addition to minimum 12 weekly frequencies, the service would also need to operate a minimum 20,000 seats. Based on these minimum service requirement, the annual movements and capacity of the different airlines over the course of a year are outlined as per below table.
- In terms of sector time for Glasgow services, the piston-engined islander and Trislander operations would have the slowest sector time of 75 minutes, with the DO228 and Let-410 having sector times of around 1 hour.

Aircraft types, typical configuration and annual capacity

Aircraft	Typical Seat Configuration	Annual Movements	Average Weekly Frequencies	Annual Capacity	Annual Passengers (LF 64%)	Sector Block Hours
DHC-6-300 (Twin Otter)	19	1250	12x	23,750	15,105	1.2
Do228-212	19	1250	12x	23,750	15,105	0.9
BN-2B-26 Islander	9	2223	21x	20,007	12,724	1.3
BN-2A Mk III Trislander	17	1250	12x	21,250	13,515	1.3
Let-410	19	1250	12x	23,750	11,281	1.0
Cessna 208B (Grand Caravan)	13	1539	15x	20,007	12,724	1.1

Note: Let-410 payload restricted to 48% load factor/ 9 passengers per flight

4.3 Commercial analysis of Skye-Glasgow service

Typical aircraft capacity, frequency of operation and payload constraints

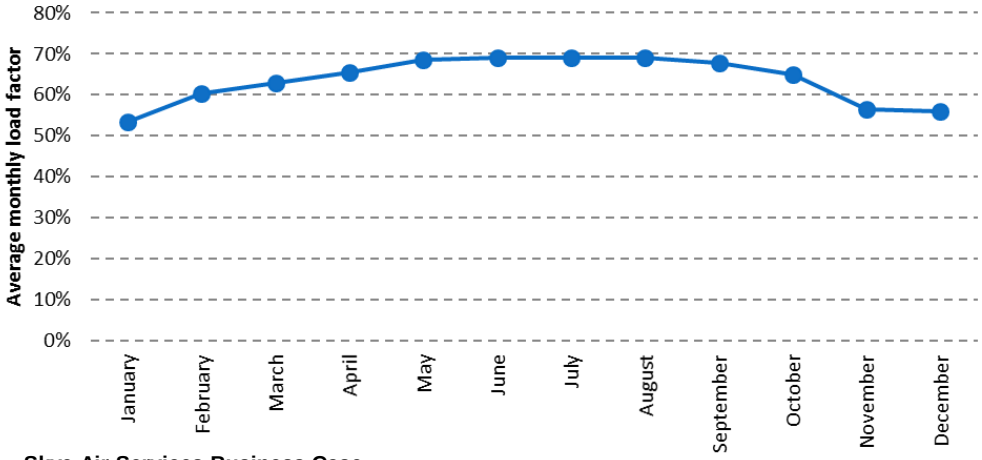
- Given the theoretical unconstrained demand of 23,799 passengers, a 12x weekly service with any of the 19 seat aircraft could almost meet 100% of theoretical demand. The Islander would have insufficient capacity to enable the full demand to be theoretically handled and therefore would constrain the passenger forecast before taking in to account any payload restrictions. In the case of Let-410, the payload restriction will reduce the potential of the operation to meet the full unconstrained demand.

- However, while the benchmark demand forecast shows a high correlation, there will inevitably be specific factors which will reduce the actual overall demand, such as the actual timing of flights being unsuitable for some passengers, or revenue management of fares resulting in more price-sensitive passengers being put off from flying. The unconstrained demand forecast does, however, show there should be demand for air services and gives an indication as to likely service frequency (as discussed, 12x weekly initially).

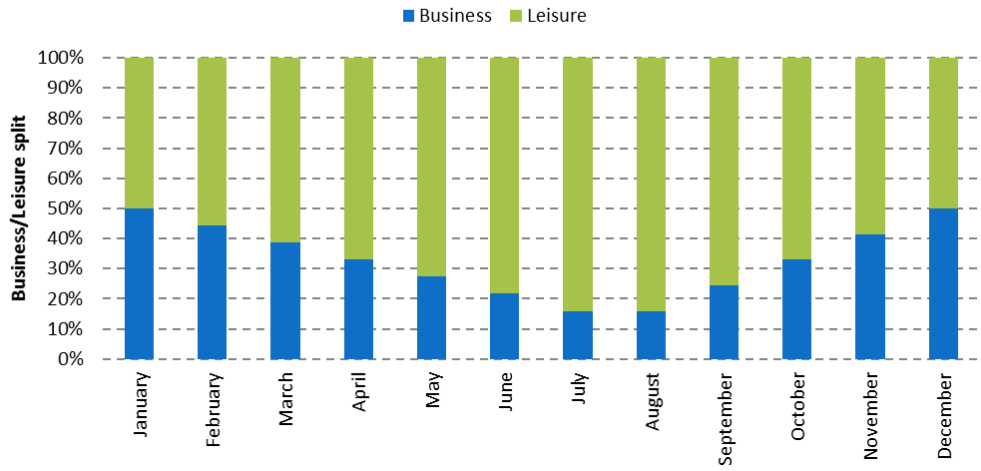
- A more detailed bottom-up forecast for the base year has therefore been constructed, based on a 12x weekly service with a 19-seater aircraft. The potential capacity from this operation has been reviewed on a monthly basis. Demand for services will inevitably vary throughout the year, with summer services typically being busier than winter services (due to such factors as an increase in tourism in summer months).

- Based on the average monthly load factors from benchmark HIAL routes, the likely monthly load factor and business/leisure profiles for the proposed Skye Air Service are shown below:

Typical monthly demand profile for HIAL routes
Source: CAA, RDCApex, RDCA Analysis



Approximate business/leisure seasonality split
Source: CAA, RDCA Analysis



4. Traffic Forecasts

4.3 Commercial analysis of Skye-Glasgow service

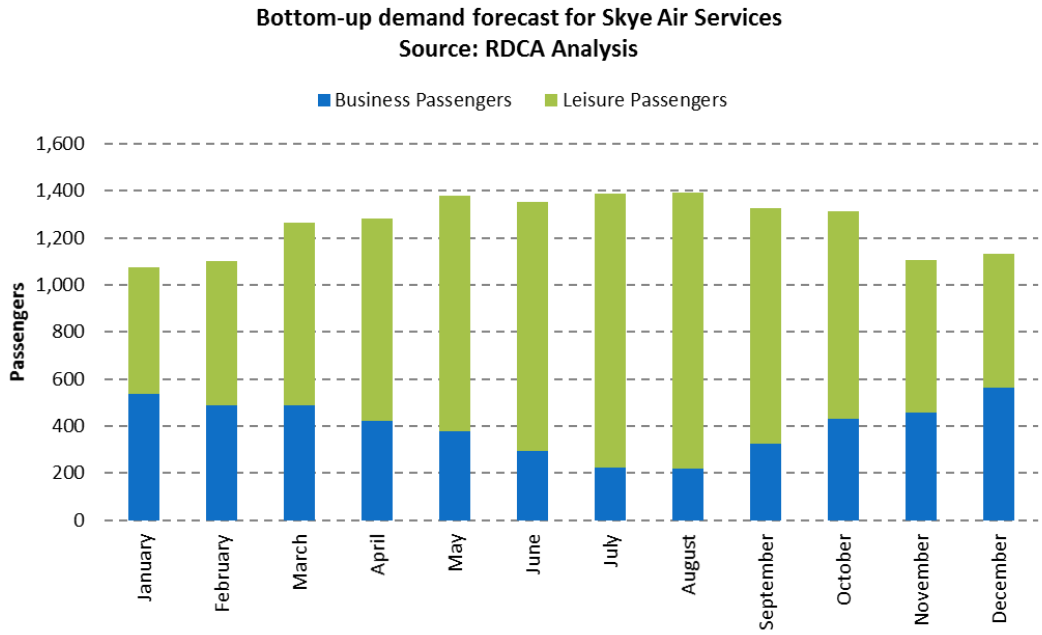
Bottom-up forecast by month and passenger type

- Based on these monthly profiles and an assumed schedule offering 12x weekly rotations, the overall monthly passenger demand if shown top right.

- In total, this bottom-up forecast gives **15,105** for a 19-seater aircraft. While this is lower than the unconstrained benchmark demand forecast, it looks reasonable in the context of other passengers on mainland HIAL services.

- This demand gives an annual average load factor of 64%, which again looks reasonable in the context of the average load factors seem on benchmark routes.

- As discussed, demand in summer months is likely to be greater than in winter months. The typical business/leisure profile by month shows a relatively consistent business demand throughout the year, except during summer months when business traffic falls slightly. Again, this seems reasonable – fewer business trips would be expected during the main holiday season.



4.3 Commercial analysis of Skye-Glasgow service

Annual demand, movements, and airport revenue

- Based on an average load factor of 64%, the following annual revenues would be generated from aeronautical charges (based on those currently levied at HIAL airports) and commercial incomes (based on HIAL average revenue per passenger for 2014/15, reduced slightly to account for a more limited offering at Skye Airport).

- For the 19-seater aircraft, services could generate over £170,000 revenue for the airport per annum. However, if services were operated on the smaller Islander aircraft, revenues would be significantly less due to a lighter MTOW and being able to carry fewer passengers.

Potential airport income (based on 64% load factors and minimum 12x weekly services/20,000 annual capacity)

Annual Airport Income

Aircraft	DHC-6-300 (Twin Otter)	Do228-212	BN-2B-26 Islander	BN-2A Mk III Trislander	Let-410	Cessna 208B
Typical MTOW (kg)	5,700	6,600	2,990	4,500	6,400	3,990
Sectors per annum	1,250	1,250	2,223	1,250	1,410	1,539
Annual Capacity	23,750	23,750	20,007	21,250	26,790	20,007
Typical annual passengers @ 64%[1] Load Factor	15,105	15,105	12,724	13,515	12,724	12,724
Note: Let-410 at maximum 9 passengers/flight						
Airport Fees and Charges (based on HIAL 2016 Published Charges)						
Landing charge (per 1,000kg MTOW)	£11.61	£11.61	£11.61	£11.61	£11.61	£11.61
Passenger Service Charge per departing passenger	£17.04	£17.04	£17.04	£17.04	£17.04	£17.04
PRM Charge per departing passenger	£0.50	£0.50	£0.50	£0.50	£0.50	£0.50
Total aeronautical revenue (assuming no rebates or discounts)	*£173,831*	*£180,362*	*£150,178*	*£151,180*	*£163,973*	*£147,240*

- In addition to any aeronautical revenues from passenger services, there may be some scope to receive revenue from GA/private flights, which assuming they're brought within the HIAL charging structure, are currently charged a flat rate of £20.00 per landing (subject to various terms and conditions). Other comparable HIAL airports (Barra, Benbecula and Campbeltown) have limited GA/Private movements (between 38 and 160 departures per annum), generating between £760 and £3,200 approximately in revenue per annum.

- It is not expected that any significant commercial revenues would be generated, if any. However the opening of the site for operations, may encourage development in adjacent land.

[1]Let-410 payload restricted to 48% load factor/ 9 passengers per flight

4.3 Commercial analysis of Skye-Glasgow service

Per-sector cost assessment of services from Skye to Glasgow

- Given the strong preference for services to Glasgow International or Edinburgh Airport from the 2012 online survey, operational costs to these airports have been assessed based on the previous 6 aircraft types.

- Per sector operating costs from Skye to Glasgow have been determined through RDC Aviation's proprietary software *routepro.net.* Developed over the last 12 years, *routepro.net* is a detailed airline-aircraft operating economics tool, enabling detailed route profitability/operating costs analysis to be conducted.

- The software is being constantly updated with the latest costs, covering items such as lease rates, insurance, variable passenger elements (such as catering and GDS distribution), handling rates and aircraft-engine specific fuel burn (and therefore determining fuel costs). In addition, the most current airport charges are sourced, enabling specific weight and passenger based costs to be determined.

- For the purposes of this assessment, the following has been assumed to determine per-sector costs:
  - The aircraft is fully dedicated for the Skye service (1,500 hours per annum for 12x weekly services using DHC-6-300). For comparison, each Loganair aircraft was utilised for an average of 1,359 hours in 2015, Source: CAA, Loganair)
  - A higher contingency cost (10%) has been used than normal to account for a greater risk of weather disruption and higher overheads due to the remote location of the area;
  - Airport charges for operating from Skye have been based on other HIAL airport charges and services to Glasgow are subject to a weight-based rebate of 26% due to operations being intra-Scotland;
  - Fuel prices of £1.40 per US Gallon have been used for Jet-A1 and £2.80 per US Gallon for Avgas.

Per-sector cost assessment of services from Skye to Glasgow

- Within the cost structure of *routepro.net*, items such as route marketing, airline management costs and other overheads are included in a general 'overheads' section. This is based on published annual accounts be airlines, where these miscellaneous cost items are included.

- Therefore, the *routepro.net* output costs cover all aspects of an airline's operating costs, being calibrated on an annual basis to ensure the most current data is used.

- Aircraft lease costs are sourced from ACAS and are specific to the typical age of the aircraft used in an airline's fleet. For example, an older Twin Otter DHC6-300 aircraft used by UK regional airlines are older, and therefore cheaper to lease, than newer built aircraft of the same type.

- For the purposes of this analysis, typically aged aircraft have been selected based on those leased/owned by UK regional airlines, but if younger (or older) aircraft were used to operate the Skye service, the operating costs would be impacted accordingly.

- The aircraft's utilisation time has been allocated specifically to this service. While there could be options to utilised the aircraft in-between morning and evening rotations (thereby increasing the utilisation and decreasing the allocation of fixed costs on a per-block hour basis), this has not been considered in this analysis. Therefore, there may be an upside of reduced operating costs allocated to the Skye service if the aircraft were used at other times during the day.

- For comparison, however, Loganair's average aircraft utilisation in 2015 was 1,359 hours. A 12x weekly Skye service would result in approximately 1,500 hours of flying time and therefore seems a reasonable time allocation in the context of the main operator at HIAL airports.

4.3 Commercial analysis of Skye-Glasgow service

Average fare calculation

- Based on the *routepro.net* output for each route and aircraft combination, the following per-sector costs are shown in the table below.

- Average one-way airport charges for each airport are included, taking into account any discounts such as those offered at Glasgow on weight-related charges due to the flight being Intra-Scotland.

- The required break-even one-way fare (plus 10% profit margin) ranges from £124 to £160 with the Grand Caravan and Twin Otter having the lowest break-even gross fare per passenger. As mentioned, the 10% profit margin would be in addition to any company overheads, marketing costs etc. It should also be noted that flights from airports in the Highlands and Islands are exempt from Air Passenger Duty (APD) and therefore this eases the pressure slightly on gross fare costs. It is assumed that services from Skye are also subject to this exemption (HMRC Note 550 Air Passenger Duty is explicit in the airports which are exempt from the charge – Skye is not included, but clearly fits within the grouping mentioned). In addition, the aircraft type which are likely to operate this service would be exempt from APD from the mainland airport too (though if policy regarding the exclusion of certain aircraft due to their MTOW were to change, then APD may be applicable for the return flight).

- The break-even fare level would vary according the actual carried load. A greater number of passengers per flight would result in fixed operating costs being allocated to a greater number of people, therefore resulting in a lower cost per passenger (and vice versa).

Gross fare required, at 64% average load factor, to deliver 10% profit margin to airline - Skye to Glasgow

Aircraft	Per sector cost (with 10% profit margin)	Gross fare
DHC-6-300 (Twin Otter)	£1,525	**£126**
Do228-212	£1,770	**£147**
BN-2B-26 Islander	£914	**£160**
BN-2A Mk III Trislander	£1,446	**£134**
Let-410	£1,310	**£145**
Cessna 208B (Grand Caravan)	£1,028	**£124**

Source: Routepro.net, gross fare based on annualised operation

Note: Let-410 payload restricted to 48% load factor/ 9 passengers per flight

4.3 Commercial analysis of Skye-Glasgow service

Willingness to pay

- In the 2012 online survey conducted, respondees were asked "*how likely would you be to use an air service to/from Skye at the following one-way fares?*". Based on those passengers who stated they would use air services to Glasgow or Edinburgh (regardless of how often they would use the service), the chart below summarises percentage of respondents who would be likely or very likely to use air services from Skye at the appropriate fare bracket. Note that, in general, people's willingness to pay for Edinburgh and Glasgow services are approximately the same.

- If fares were priced 'Under £90', 99% of respondents would be likely or very likely to use the air service. Likewise, if priced between £91 and £110, around 85% of passengers would again be likely or very likely to use the air service. However, beyond this point, interest in using the air service at high prices drops off rapidly, with less than 50% likely or very likely to use the service if priced between £111 and £130.

- This indicates that in order to keep passengers using a service, one-way air fares should be within the range of £90-£110 – any higher and demand may start to drop off. In taking the middle ground of £100 for a gross one-way fare, this gives a suitable indication of what people are willing to pay.

- The change in willingness to pay in various price brackets ties in with the wider elasticity studies previously discussed, with elasticity values ranging from -0.53 to -1.98. Taking the mid-point fare of each bracket, and the change in people's willingness to pay for each bracket, the following elasticities are gained:

	£91 to £110	£111 to £130	£131 to £150	Over £150
% change in fare from lower bracket	25%	20%	17%	14%
% change in demand	-13%	-38%	-28%	-12%
Elasticity	-1.98	-0.53	-0.61	-1.15

- Leisure travellers typically pay lower fares than business travellers and therefore the elasticity at the lower fare end (-1.98) could be representative of leisure travellers. Within the middle fare brackets, the higher-spending business traveller may be more willing to accept higher fares due to the time-saving benefits offered by flying, hence lower elasticities. At the far end of the fare scale, the price will be reaching a point where even business travellers will be put off, resulting in an downswing in elasticity again.

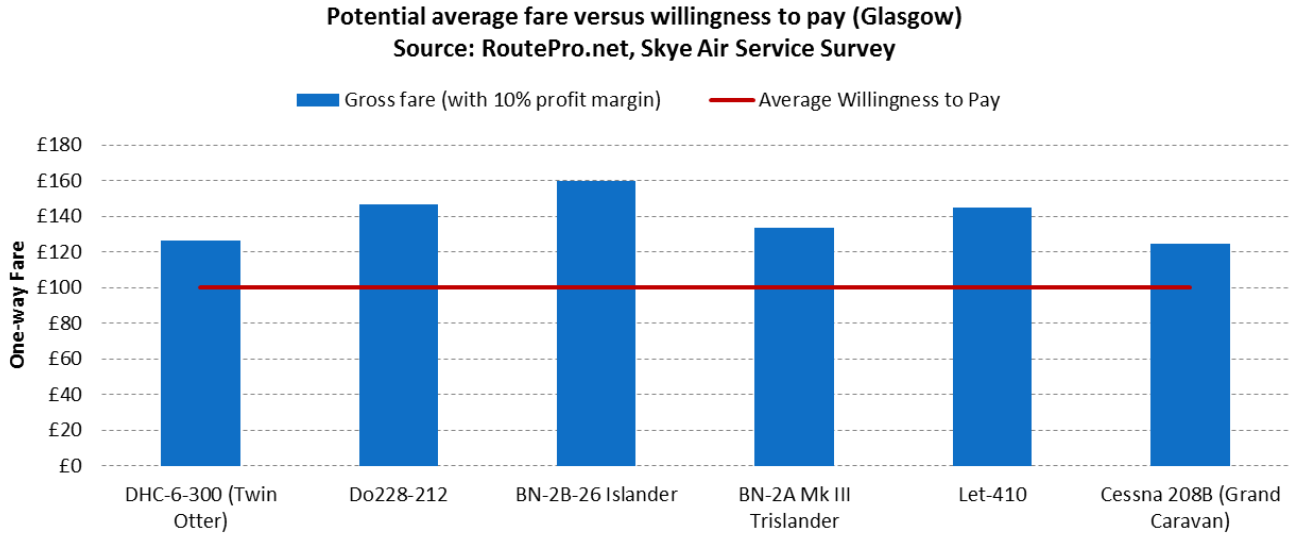
- It should be noted that willingness to pay statements are not necessarily a true indicator of what fare will be achieved. If services are not aligned with people's expectations, they may pay less in reality, or indeed if faced with a 5-6 hour drive, may pay more than they originally indicated they would. Therefore, this is used as guide of potential rather than an absolute figure.

4. Traffic Forecasts

4.3 Commercial analysis of Skye-Glasgow service

Willingness to pay versus required gross fare

- Combining the analysis on gross fares which could be potentially required by an airline to deliver a 10% profit margin at a 64% load factor[1], along with the survey responses for willingness to pay, the charts to the right show how these compare.
- The gross fare for the Twin Otter and the Grand Caravan are higher (by 24-26%). Required fares for the rest of the aircraft are much higher than the stated willingness to pay and therefore indicate that these aircraft types are unlikely to be commercially sustainable.
- As stated, people's willingness to pay will be determined by various other factors. In addition, variations to fare levels will inevitably occur (such as higher fuel prices, different lease rates, demand being lower than forecast and indeed differences in how airlines account for operating costs, especially in relation to PSO type services). Furthermore, comfort and service level of the flights may also affect willingness to pay.
- This analysis, however, indicates that services from Skye to Glasgow are unlikely to be commercially sustainable.
- The analysis on gross fares does not account for the opex/capex costs associated with the Skye airport infrastructure as well as additional cost of new airline base out of Skye. Some of this may, in part, be covered by the airport charges imposed at Skye, but it is assumed that these cost are largely met by the Scottish Government.



[1]Let-410 payload restricted to 48% load factor/ 9 passengers per flight

4. Traffic Forecasts

4.3 Commercial analysis of Skye-Glasgow service

Annual airline operating costs and PSO support

- When aggregated over the course of a year, airline operating costs would vary between £1,600,000 (Grand Caravan) through to over £2,200,000 (Do228).
- The services which have the least loss based on required break-even fare and willingness to pay (Grand Caravan and Twin Otter) would have annual operating costs of between £1.6m and £1.9m per annum respectively, based on the operating/cost assumptions previously discussed.
- Based on revenue of £100 gross fare per passenger, the service could lose between -£310,000 to -£760,000 in the first year.
- As such a PSO type support would be needed to cover the loss of operating the Skye-Glasgow service.

Estimate annual airline operating costs (based on 64%[1] load factors and minimum 20,000 annual seats) - Skye to Glasgow

Aircraft	DHC-6-300 (Twin Otter)	Do228-212	BN-2B-26 Islander	BN-2A Mk III Trislander	Let-410	Cessna 208B (Grand Caravan)
Per sector costs	£1,525	£1,770	£914	£1,446	£1,310	£1,028
No. of Sectors (Minimum 12x week, 20,000 annual seats)	1,250	1,250	2,223	1,250	1,410	1,539
Average Weekly Frequencies	12x	12x	21x	12x	14x	15x
Annual Seats	23,750	23,750	20,007	21,250	26,790	20,007
Annual Passengers	15,105	15,105	12,724	13,515	12,724	12,724
Total airline operating costs (incl. margin & airport charges)	**£1.91 m**	**£2.21 m**	**£2.03 m**	**£1.81 m**	**£1.85 m**	**£1.58 m**
Market Fare Level per passenger	£100	£100	£100	£100	£100	£100
Total airline revenue	**£1.51 m**	**£1.51 m**	**£1.27 m**	**£1.35 m**	**£1.27 m**	**£1.27 m**
Profit/Loss (PSO Subsidised)	**-£0.40 m**	**-£0.70 m**	**-£0.76 m**	**-£0.46 m**	**-£0.57 m**	**-£0.31 m**

[1]Let-410 payload restricted to 48% load factor/ 9 passengers per flight

4.3 Commercial analysis of Skye-Glasgow service

Potential impact of Air Discount Scheme

- The Air Discount Scheme (ADS) provides a 50% discount on air fares for eligible routes and for eligible residents (including those resident in Colonsay, Orkney, Shetland, the Western Isles, Islay, Jura, Caithness and North West Sutherland).

- The ADS does not extend to business-related travel, which would cause a material breach of the terms and conditions of the scheme. In addition, NHS related traffic is also excluded and, therefore, only outbound leisure traffic would be able to claim any form of fare saving through the scheme.

- Therefore, based on the profile of traffic by purpose (in terms of inbound/outbound and business/leisure splits), approximately 4,300 passengers would be eligible to reduce their net fares (i.e. excluding any airport charges/APD if applicable) by 50%.

- A report into the impact of the ADS (*Review of the Air Discount Scheme, Halcrow, 2008*) found that of those people eligible for the ADS, 87% were members. The remaining 13% who were eligible but not members reported they were unlikely to travel anyway (due to issues with mobility), were unaware of the scheme or unaware of the application process.

- It is assumed that a similar picture would emerge in Skye/Lochalsh region and that despite offering cost savings, only 87% of eligible passengers are actually members of the scheme.

- It is also assumed that Skye/Lochalsh residents would actually be made eligible for the ADS (currently it is restricted to specifically residents of those areas mentioned in the first paragraph) and that the service does not receive a PSO (again, those services which are directly subsidised are not eligible).

Potential impact of Air Discount Scheme

- With a leisure cost elasticity of -1.4, a 50% reduction in fare would theoretically lead to an increase in demand of 70% and result in the following:

Assessment of potential impact of ADS on overall demand

	Value	Comments
Base case forecast	15,105	
Base case outbound leisure demand (eligible for ADS)	4,322	Based on leisure and outbound profiles
Eligible members who are actually users of the ADS	87%	Based on Halcrow study into other ADS routes
Base case outbound demand which takes advantage of ADS discount	3,760	
Stimulation impact from lower fares	70%	
Additional demand stimulated from lower fares	2,632	
New outbound leisure demand	*6,392*	
Base case 'other' passengers (ineligible for ADS)	*11,345*	Inbound leisure, business passengers and outbound leisure not taking advantage of ADS
ADS stimulated base case demand	**17,737**	
Overall stimulation effect of ADS	17%	

- Overall, if ADS discounts of 50% were applicable to services from Skye, the overall impact would be a 17% growth in traffic on the base case forecast.

- In comparison, the 2008 Halcrow study found that, in the year after the ADS was implemented, passenger numbers on eligible routes grew 12%, supporting the potential growth in demand for Skye if ADS discounts were offered.

4. Traffic Forecasts

4.3 Commercial analysis of Skye-Glasgow service

Potential impact of Air Discount Scheme

- If the Skye-Glasgow service is to run commercially, the ADS will be applicable to the eligible passengers on the commercial break-even fare level.
- The estimated cost of the ADS will then range between -£175,000 to -£250,000 a year which are lower than the PSO support cost.
- However, it is highly unlikely that a route to Glasgow would be sufficiently attractive for an airline to launch operations on a commercial basis given the high break-even fare level.

Estimate annual ADS costs (based on 64%[1] load factors and minimum 20,000 annual seats) - Skye to Glasgow

Aircraft	DHC-6-300 (Twin Otter)	Do228-212	BN-2B-26 Islander	BN-2A Mk III Trislander	Let-410	Cessna 208B (Grand Caravan)
Commercial Break-even Fare Level	£126	£147	£160	£134	£145	£124
Applicable ADS Fare For Eligible Passengers	£56	£66	£73	£60	£66	£55
ADS Fare Discount (ADS subsidised)	**-£0.21 m**	**-£0.25 m**	**-£0.23 m**	**-£0.20 m**	**-£0.21 m**	**-£0.18 m**

[1]Let-410 payload restricted to 48% load factor/ 9 passengers per flight

4.3 Commercial analysis of Skye-Glasgow service

Base case sensitivities – passenger demand

- The unconstrained, macro-economic demand forecast of 23,799 passengers gives a good sense check against the bottom up, month by month forecast of around 15,105 passengers (with an annual load factor of 64% for 19-seats aircraft).

- Based on other HIAL services to/from Glasgow Airport, the average annual load factor is 60% with a standard deviation of 12%. This gives some boundaries of upper and lower variances from the base case bottom up Skye forecast to consider as demand sensitivities.

- The table to the right summarises the impact these higher and lower average annual load factors would have on the base case demand. At the lower load factor end, around 2,800 fewer passengers per annum would be handled. Likewise, that the higher load factor end, around 2,800 more passengers per annum would be handled.

- A range of demand sensitivities reflects the fact that, despite all due diligence being applied to forecasting methodologies and analysis, the actual operated outcome may be different from the base case. The range presented here gives an idea as to realistic boundaries which could occur if air services were introduced.

- For comparison, the higher load factors (76%) on the 19-seater aircraft would be equivalent to those given if demand were stimulated through lower fares due to the ADS being applicable.

Low, base and high annual demand based on potential variance from base case - Glasgow

Aircraft	Annual Capacity	Annual average load factor		
		52% (Low Case)	64% (Base Case)	76% (High Case)
DHC-6-300 (Twin Otter)	23,750	12,279	15,105	17,979
Do228-212	23,750	12,279	15,105	17,979
BN-2B-26 Islander	20,007	10,344	12,724	15,145
BN-2A Mk III Trislander	21,250	10,986	13,515	16,086
Let-410[1]	26,790	12,724	12,724	12,724
Cessna 208B (Grand Caravan)	20,007	10,344	12,724	15,145

- For comparison, the demand given at the higher end of the range (for the 19-seater aircraft at least) would be comparable to the demand from ADS stimulated demand previously discussed (17,737 passengers per annum)

- The lower end demand could be representative of several factors, such as higher fuel/fare costs supressing demand or fewer people using the service (due to operational times being unsuitable for example).

- In context, the boundaries seem reasonable, especially against the background of performance on other HIAL services.

[1]Let-410 payload restricted to 48% load factor/ 9 passengers per flight

4.3 Commercial analysis of Skye-Glasgow service

Base case sensitivities – route support

- The base case demand of 15,105 passengers per annum (19-seater aircraft) , with the stated willingness to pay indicates that regardless of aircraft type and destination, there will be a shortfall in in fare revenue compared to operating costs. The low case demand would give required fare levels far above the willingness to pay threshold and therefore a large subsidy would be required to make the service feasible.

- If the service was deemed commercially sustainable by an airline without the need for a PSO, but the service was eligible for the ADS, there would be a cost associated with providing the discount to eligible residents.

- Therefore, there are two scenarios with three varying levels of cost: low , base and high demand which would require PSO type subsidy of the route (required fares above willingness to pay threshold and where ADS would be not eligible) and ADS eligible costs (where PSOs would not be required, but costs would be associated with providing the fare discount) which would be representative of the high case sensitivity.

- The levels of potential subsidy in the three scenarios mentioned above are shown below for year one of operation. The Grand Caravan and Twin Otter would have the lowest PSO cost in all scenario. ADS cost in the high demand case would be lowest for Grand Caravan operation as well.

Range of potential subsidy costs in year one - Skye-Glasgow

Aircraft Type	Low demand (PSO Subsidy)	Base demand (PSO Subsidy)	High demand (PSO Subsidy)	High demand (ADS Cost)
DHC-6-300 (Twin Otter)	£0.64 m	£0.40 m	£0.15 m	£0.21 m
Do228-212	£0.95 m	£0.70 m	£0.46 m	£0.25 m
BN-2B-26 Islander	£0.96 m	£0.76 m	£0.55 m	£0.23 m
BN-2A Mk III Trislander	£0.67 m	£0.46 m	£0.23 m	£0.20 m
Let-410	£0.57 m	£0.57 m	£0.57 m	£0.21 m
Cessna 208B (Grand Caravan)	£0.52 m	£0.31 m	£0.10 m	£0.17 m

4.3 Commercial analysis of Skye-Glasgow service

Connection options at Glasgow

- The survey responses indicated that preferred outbound times from Skye would be between 06:00 and 10:00, with 08:00 to 10:00 being most commonly preferred. Inbound flight times were most commonly preferred for 18:00 to 20:00.

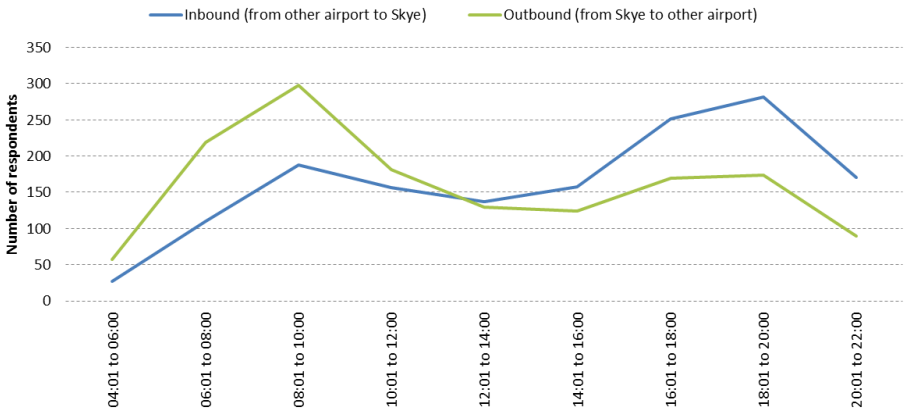
- In terms of connections at Glasgow, the main outbound services to major EU/global destinations depart these airports between 08:20 and 10:00 and therefore any feeder service which wished to connect with these services would need to arrive at between 07:00-07:30 to allow suitable time to catch the connection. Therefore, flights would need to depart Skye at around 06:00.

- However, this would be unlikely to be achieved, especially as the aircraft is likely to be based at the mainland airport. This is primarily due to the provision of spare aircraft (in case of technical fault) and hangar space (which is not available at Skye).

- Glasgow services typically depart other HIAL airports at between 09:05 and 11:50. Of all HIAL services, only Kirkwall and Sumburgh have aircraft based away from the mainland airport. Services to Glasgow are all operated on aircraft based at Glasgow overnight.

- Therefore, despite the benefits of catching early morning connections from Glasgow, it seems unlikely that this would be feasible and therefore connections to other UK, EU and Global destinations would be in early afternoon, assuming Skye services operating on a similar timing as other HIAL services.

If flights were to be introduced between Skye and your preferred airport, which times would best suit your travel habits? (n=488)
Source: Skye Air Service Survey



Typical weekday operating times to Glasgow Airport
Source: Flybe.com

From	Departure Time	Arrival Time	Base?
Barra	11:50	13:00	Glasgow
Benbecula	11:35	12:30	Glasgow
Islay	09:45	10:20	Glasgow
Campbeltown	09:05	09:45	Glasgow
Stornoway	08:25	09:25	Glasgow
Sumburgh	11:50	13:20	Glasgow
Tiree	10:10	11:05	Glasgow

4.3 Commercial analysis of Skye-Glasgow service

Connection options

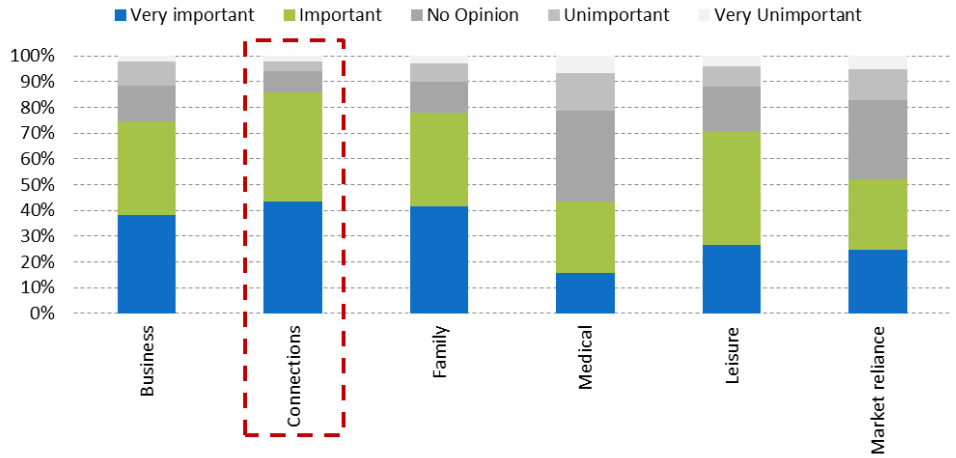
- Despite the difficulties in managing the operation to enable morning connections to be made at Glasgow, the importance of connections was cited by respondees to the online survey, with 85% stating that connections were important or very important in peoples' decisions when deciding whether or not to use an air service.

- However, this sentiment was not necessarily backed up with evidence that people would regularly use the air service for connections. When asked *"How regularly would you use air services from Skye to enable you to catch connecting flights to the following destinations outside Scotland?",* only 35% said they would very regularly or regularly use Skye air services for connections to London, 30% to other UK airports, 20% to other EU airport and 15% to other global destinations.

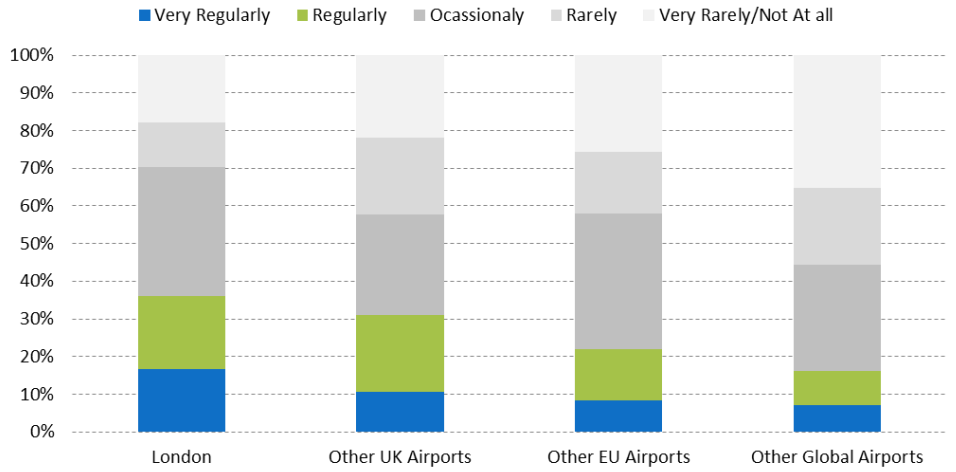
- The statement of connections being very important may be more related to the perception of making Skye less remote and offering connectivity possibilities, rather than being a vital part of demand.

- That said, it is likely that some people would connect onto other services, but may not be the largest factor in determining the timing of services.

Importance of Skye link due to the following factors
Source: Skye Air Service Survey



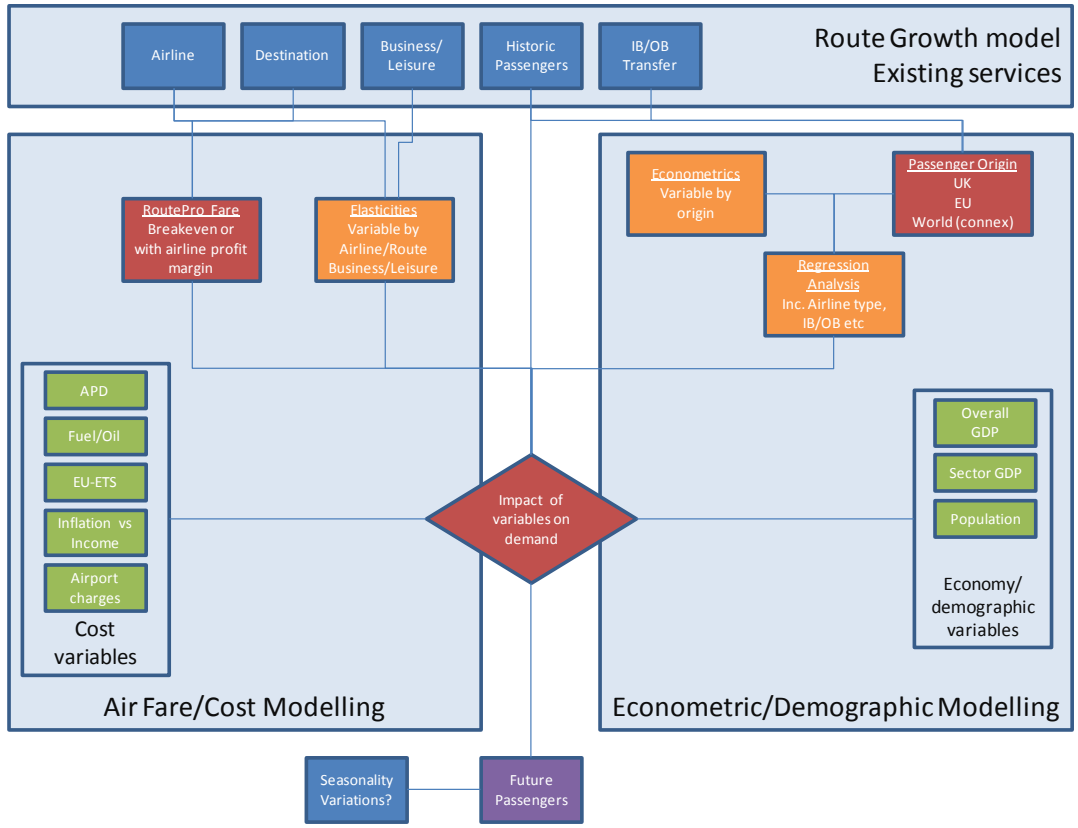
Frequency of using air services from Skye for connections
Source: Skye Air Service Survey



4. Traffic Forecasts

4.3 Long term forecasts

- In order to assess the longer-term potential and benefits of investing in air services to/from Skye, and to assess the potential impact on demand from varying operating costs (such as varying fuel prices), a long-term forecast model has been constructed. The flow diagram below summarises the general approach undertaken as part of the forecast. The top and right hand side sections summarise the demand forecasting, with long-term growth multipliers coming from benchmarked historic performance of other HIAL services. The left hand side of the flowchart summarises the initial RoutePro.net fare calculation which, when combined with cost elasticities on a business and leisure perspective (as discussed in section 2) and assumptions on how operating costs (and therefore fares) could change over the forecast period, enabling demand to be assessed against future air fares.



4. Traffic Forecasts

4.3 Long term forecasts

Data sources and inputs

- The base case bottom up forecast (of around 15,105 passengers per annum on a 12x weekly service with a Twin-Otter style aircraft) has been used as a base year, along with the breakeven fare for the Glasgow service (which seems more appropriate to use given the profile of services from the Western Isles and that these fares are closest to those which people are willing to pay).

- Future operating costs (such as lease rates, maintenance costs etc) have been based on the typical age of a Twin-Otter style aircraft used in the UK at present and how these will change in future years as the aircraft ages. Some operating cost elements (such as insurance) are assumed to increase in line with inflation.

- Future oil/fuel price increase have been sourced from the latest US Energy Information Administration forecast, May 2016.

- Airport charges at both Skye (which are based on the current HIAL charges structure) and Glasgow Airport are assumed to increase in line with inflation.

- EU-ETS charges have been sourced from Point Carbon, a Thomas Reuters company. The EU-ETS charge is levied per tonne of CO_2, per sector emissions being calculated from the typical engines used on a Twin Otter style aircraft.

Data sources and inputs

- Business/leisure splits have been based on the bottom-up analysis by month, giving a split of approximately 32%/68% over the course of the year. This is not assumed to change over time.

- Business users are assumed to pay slightly higher fares than leisure users, based on fare research undertaken by RDC Aviation. This is reasonable – business users are likely to book closer to the time of departure and due to airline revenue management practices, this would lead to them paying a higher fare as a result.

- Business/leisure price elasticities of -0.6 and -1.4 respectively have been used to assess the suppression/stimulation in demand resulting from fare variances. These have been sourced from various studies into price elasticities as discussed in section 2.

- In terms of macro-economic growth, the performance of a comparable HIAL services to Glasgow against historic GDP has been used to give a GDP (income) multiplier.

- GDP forecasts have been sourced from IHS Global Insights. GDP forecasts are only available on a UK level and are not broken down to a regional level. However, as discussed towards the start of this section, Scotland's economy (measured in GVA per head) has generally followed that of the UK as a whole and therefore UK GDP can be used as a reasonable proxy.

- Combining the GDP multiplier with the GDP forecast provides growth factors which, when assessed with the cost/fare modelling, provides a combined perspective of long-term growth potential.

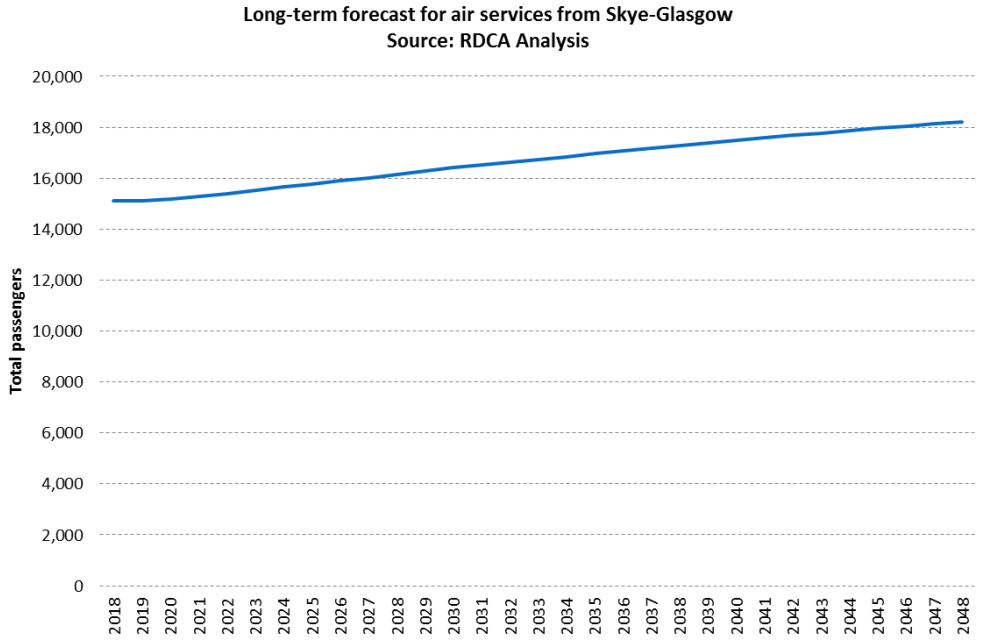
4.3 Long term forecasts – Base Case

Forecast outputs

- The long-term forecast has been extended through to 2048 to give a 30-year indication of potential demand change in the long-run. Over the long-term period. It has been assumed that the aircraft type used remains the same. New aircraft types could potentially be used on this type of service, but more detailed research would be required to assess a more likely entry point for new aircraft for airlines which could potentially operate such a service from Skye.

- Over the long-term period, taking fare variations and general GDP-driven growth into account, demand is forecast to grow from 15,105 passengers in 2018 (as the base year) to 18,200 by 2048. This would give an annual average growth of around 100 passengers, which is comparable to the average annual growth in passengers on other Western Isle-Mainland services discussed in section 2 (with Tiree, Campbeltown and Barra adding an average of 150 passengers per annum).

- If this future demand had a similar monthly profile, summer demand would result in load factors starting to exceed 90-95%. This would likely be managed through the addition of additional frequencies, increasing to 14x weekly and perhaps more in peak summer periods.



4. Traffic Forecasts

4.3 Long term forecasts – Base Case

Forecast and Commercial Analysis Summary

- The unconstrained air traffic demand from Skye has been estimated at 23,799 passengers. This is higher than the previous 2013 study of 21,574. The higher increases are mainly due to the increase travel propensity of the Highlands population.

- The bottom-up forecast of service assumes 12x weekly flights using 19-seat aircraft at 64% load factor (15,105 passengers) based on latest benchmarked load factor of similar routes. This compares to previous assumption of 62% load factor. The long term forecast of bottom-up traffic projects passenger growth of 0.6% p.a.. This is slightly lower than previous study growth projection of 0.8% p.a.

- The aircraft operating cost analysis shows the overall break-even gross fare for Glasgow service to be lowest for Grand Caravan and Twin Otter at £124 and £126 per passenger respectively.

- With a gross fare level of £100 per passenger considered to be a level that passengers might be willing to pay, operation of unsubsidised services are unlikely to be commercially viable. It is more likely that assistance, both financially and in terms of marketing and other support, would be needed to attract airlines to establish and maintain regular scheduled air services to Skye.

- The Year 1 operating cost range from £1.6m for Grand Caravan to £2.2m for Do-228. The lowest per passenger aircraft operations for Grand Caravan and Twin Otter have annual operating cost of £1.6m and £1.9m respectively.

- The potential Year 1 subsidy for Grand Caravan and Twin Otter are estimated to be £309,000 and £400,000 respectively in the base case.

- However, aircraft availability is likely to be an important issue. Operators seek to operate as few different types of aircraft as possible to simplify availability of spares and crew training. There are relatively few operators that have the appropriate equipment for serving Skye Broadford. The potential return (profit) is unlikely to be large enough/attractive enough to warrant obtaining new equipment and therefore the number of potential operators will be limited. In this respect the availability/ familiarity of the Twin Otter operation would be a plus compared to the Grand Caravan operation which as highlighted before has not been done on a scheduled basis . Furthermore, comfort and reliability level would need to be considered comparing the Twin Otter with the Grand Caravan.

- Potential airline candidates for the Twin Otter is Logan Air as it is well experienced in the Scottish Highlands operation, operating a fleet of Twin Otters on its own and on behalf of the Scottish Government on PSO routes. Given the regulatory restriction that had been imposed on the Grand Caravan , there are limited number of scheduled passenger operators within Europe, with Loch Lomond Seaplanes a potential candidate. Conversely, the service could be developed by an independent aircraft charter/management company sourcing the specific aircraft and running the operation on behalf of the Scottish Government.

4. Traffic Forecasts

4.4 Wider economic benefits – Base Case

High level gross economic benefits

- A high-level analysis has been undertaken to assess the gross economic benefits of the proposed service, both initially and over a 30-year forecast period.
- The analysis updates the previous analysis conducted in 2013 and also draws from the comments and conclusion from the 2015 study conducted by Ekosgen titled “Economic and Social Benefits of Proposed Air Services at Skye Airport”.
- The 2015 Ekosgen report identified aside from the direct journey time cost savings, further business constraints and organisational inefficiency cost could be eliminated with the introduction of direct air service from Skye.
- Some of the business inefficiencies identified were the need to overnight /extend stay for current travellers to the Central belt given the long journey time making day trips unfeasible. Additionally morning meetings in the Central Belt and also connecting to morning flights from Glasgow Airport would require overnight stay. For businesses, these current travel constraint and the cost associated to it have a negative impact to business productivity and customer/market reach which in turn would affect business sales. Removing these constraints through development of direct air service from Skye could bring potential economic benefits exceeding the monetised benefits outlined in earlier sections. However, as highlighted by Ekosgen, there is no established methodology for quantifying these positive impacts.

Short Term Wider Economic Benefits	Long Term Wider Economic Benefits
• Improved business confidence and interaction	• Growing key clusters, e.g. Life sciences, Professional
• New markets/opportunities (sales)	services, Food and drink
• Growth of Creative industries and Professional sectors	• More certainty for investors (but other factors important)
• Improved perception of Skye as business location	• Airport-related investment (and also levered public and
• New tourism markets	private investment)

Social Benefits
• Increased numbers in employment in the area, and the associated income generated and retained in Skye
• Greater number of younger, economically active people allows more services, including schools and health facilities
• Certain usage of the air service for personal use, for example related to health, visiting family and friends, leisure
• Contribution to regional cohesion - many other areas in the H&I have an air service that allows them to access the Central Belt more easily than from Skye
• Access to health care provision, notably additional secondary and tertiary care, including greater ease of access inbound to Skye by health care professionals

4.4 Wider economic benefits – Base Case

Components of the wider economic benefit analysis

- Reflecting the view of Ekosgen on the potential wider economic impact of introducing the air service, we have conducted the analysis of the economic benefits of direct air services from Skye broken down by the following:

Transport Economic Efficiency

- Time-saving benefits of passengers flying instead of driving
- Time-saving of reduced overnighting on business day trips

Economic contribution of operating Skye commercial airport and air services

- Direct, indirect and induced GVA impacts from the direct air service operations

Economic contribution of tourism impact

- Direct, indirect and induced GVA impacts from inbound tourism spend

- In order to assess the benefits, the following assumptions have been used:
  - Business/leisure: as discussed, the business/leisure splits have been based on CAA survey data of journey purpose by month for comparable routes, giving approximately 32% of annual demand travelling for business purposes. This is higher compared to the 30% share assumed in the 2013 study which Ekosgen viewed as being conservative.
  - Inbound/outbound: the inbound split (i.e. people living outside of the Skye/Lochalsh region using the service) has been based again on CAA survey data by month for comparable services. It is assumed however that Skye will attract a higher percentage of inbound passengers during summer months (due to the region's attractiveness as a leisure destination) which results in an annual average inbound percentage of 58% (compared to the benchmark average of 51%). This is in line with Ekosgen's finding which see feedback from their survey that suggest a potential increase in short-break visitors.

High level gross economic benefits (cont…)

- Stimulated/diverted: On the whole, it is assumed that the majority of traffic using the proposed air service would be diverted from using other modes of transport. However, based on people's current travel habits (as stated through the online survey), there is likely to be an increase in the frequency of use of the Skye air service versus current modes of transport, as well as the service making Skye more accessible for potential inbound visitors. Based on the increase in trip demand from the online survey, approximately 28% of demand is expected to be stimulated (i.e. new trips – see following page).

Profile of passengers on the Skye air service

Designation	Percentage	Absolute (year 1)
Business	32%	4,828
Leisure	68%	10,277
Inbound to Skye	58%	8,753
Outbound from Skye	42%	6,352
Stimulated	28%	4,207
Diverted	72%	10,898

Note: Based on 19-seats operation

4.4 Wider economic benefits – Base Case

Review of potential stimulation from air services

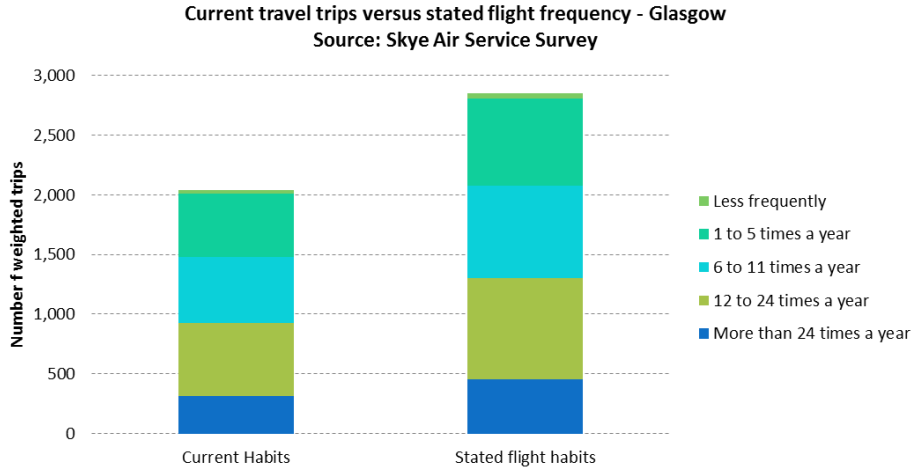
- Within the 2012 Skye Air Service Survey, respondees were asked how many trips they make in a typical year (*regardless of mode of transport)* between Skye and main areas in Scotland and the UK (with Glasgow and Edinburgh being distinct options).

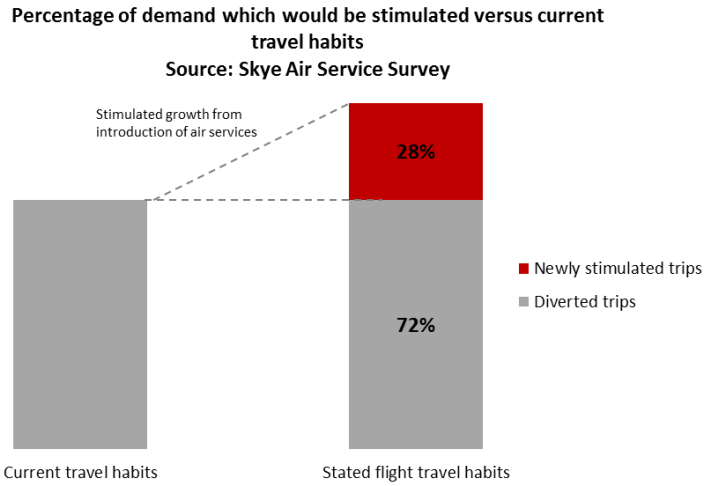
- Respondees were also asked how many return *flights* people would make in a typical year if air services were introduced from Skye to main Scottish airports.

- Based on stated responses of how often respondees currently travel to/from Skye and Glasgow compared to how often they would fly between Skye and Glasgow (weighted by the number of trips per annum made currently versus flying – e.g. if one person stated they travelled to Glasgow 6 to 11 times a year, their response was taken to count for 9 actual trips per annum – the mid-point of the bands), the introduction of air services would see an additional 39% annual trips compared to current.

- This growth in trips being made would be classed as additional (i.e. stimulated) trips which aren't currently taking place. When accounting for this additional growth within the increased total number of trips, the additional stimulated trips account for 28% of passengers.

- For comparison, a study conducted into the impacts of increasing capacity on the Campbeltown-Glasgow service (*Campbeltown Weekend Air Services Market Assessment, Reference Consultants, 2012)* forecast an 11% stimulation from adding 2 additional rotations to an existing service. A new air service would be expected to increase the level more so, so in context of stimulation on Campbeltown-Glasgow service, 28% seems reasonable.





4.4 Wider economic benefits – Base Case

Time-saving benefits of passengers flying instead of driving

- Taking check-in, drive and city centre access times into account, flying between Glasgow and Skye would save 2 hours and 30 mins compared with the equivalent drive (analysis assumes no delays):

Time comparison between driving and flying - Broadford to Glasgow City Centre

Journey sector	Driving	Flying	Comments
Broadford to Glasgow City Centre	**4 hours 45 mins**	**2 hours 15 mins**	**Drive time with 30 minute break after 2 hours**
Flight time saving	**2 hours 30 mins**		

Flight journey breakdown			
Check-in/wait prior to departure	-	45 mins	
Flight time	-	70 mins	Sector time+taxi to Glasgow Airport (DHC-6-300)
Travel to city centre	-	20 mins	Taxi journey

Source: Google Maps, Glasgow Airport, RoutePro.net

- Due to the different values attached to time by business and leisure users, the value of the saving will vary by journey purpose. Values of time (per hour) for business and leisure users have been sourced from DfT webTAG documentation (Unit 3.5.6). For business, it is assumed that business time cost relates to that for car drivers and all leisure time cost relates to non-working time for 'other' (i.e. non-commuting) purposes.
- For those passengers which are stimulated (as opposed to diverted from other modes of transport), 50% of the full value was applied. This reflects the convention of the "rule of half" which is widely used in transport appraisal.
- In total, business time savings for DHC-6 operations would equate to approximately £0.3m and leisure savings of £0.2m in year one of the service. Over a thirty year period, these savings equate to £13.2m in real terms, discounted to 2016.

Time saving benefits - Skye to Glasgow

	Business	Leisure	Comments
Value of Time (per hour)	£34	£8	2016 Prices
Benefits in year one	£0.3 m	£0.2 m	
Present value through to 2048	**£13.2 m**		Discounted to 2016 prices at 3.5% discount rate

Source: webTAG, RDCA

4.4 Wider economic benefits – Base Case

Time-saving benefits of reduced overnighting for outbound business

- In its 2015 report, Ekosgen highlighted benefits of direct air service from Skye allowing potential for business day trip to Glasgow, thus reducing the need for business trips to overnight in Glasgow. The current situation where business trips attending meetings in Glasgow needing to overnight or extend their stay would incur costs and reduce business productivity.

- In our latest assessment, we have reflected the cost-saving of eliminating these inefficiencies for business travellers by assuming the following:
  - 45% of current business travel assumed needing overnight because of the driving distance based on implied Ekosgen Survey which shows 45% of business anticipating positive impact in productivity from the new air service.
  - a saving of a minimum 8 hours of overnight period

- This result in time-saving benefits of almost £2.7 million in real terms, discounted to 2016 over a thirty year period.

Time-saving beenfits of reduced overnighting

Overnight hours	8
Business Value of Time (per hour)	£34
Benefits in year one	**£0.1 m**
Present value through to 2048	**£2.7 m**

Source: webTAG, Ekosgen, RDCA

Note: Based on 19-seats operation

4.4 Wider economic benefits – Base Case

GVA impacts from the direct air service operations

- It is estimated that 10 FTE's would be required to operate and maintain airfield operations at Broadford; 3 FTE management, 5 FTE fire fighter and 2 FTE security staff. Additionally an estimate of 6 additional flight crew position could be created from airline dedicating aircraft for the Skye service.
- Based on average GVA per employment for the transport sector in the Highlands of £43,000, the direct GVA impact associated with the direct employment at Skye Airport is estimated at £0.7m a year.
- In addition to the direct employment and economic impact on site, there would be support services/functions related to operations, supply chain activities related to the on going maintenance of the airfield and so on. In addition, the increase in employment in the area would have further impacts on spend in the region, resulting in further induced employment. Multipliers related to "Air Transport" have been sourced from the 2013 Scottish Government Input-Output Multiplier to assess the indirect and induced impact on GVA. The corresponding indirect/induced employment were then derived from converting GVA per employment figures.
- Overall, 31 additional FTE's would be created within Scotland as a result of this service. This estimate is higher than the 25 FTE's estimated in the previous study which was based on 2007 Input-Output lower multiplier and of which Ekosgen deemed as conservative.
- The direct, indirect and induced GVA associated with the air service is estimated to be £1.3 million annually.
- Over the 30-years period, the GVA benefits are expected to total £24m in real terms, discounted to 2016.

Employment and GVA related todirect air services form Skye

Employment Type	FTEs	GVA
Direct	16	£0.7 m
Indirect	10	£0.4 m
Induced	5	£0.2 m
Total (Year 1)	**31**	**£1.3 m**
Present value through to 2048		**£23.6 m**

Note: Based on 19-seats operation

4.4 Wider economic benefits – Base Case

GVA impacts from inbound tourism spend

- The additional tourism expenditure has been determined at this stage, based on typical expenditure by both business and leisure visitors.
- In our previous study we have assessed visitor spend based on Great Britain visitor spend. The Ekosgen report view this estimate as relatively conservative given the potential for more overseas and higher spending of foreign visitors. We have reflected this view by including both Great Britain and international visitors average spend to Scotland in our assumptions.
- On average, business visitors to Scotland spend an average of £308 per trip, while leisure travellers spend an average of £304 per trip.

Spend per trip by purpose in Scotland

	Business	Leisure
Total spend (£m)	£735	£3,777
Total trips (m)	2.390	12.440
Average spend per trip (£)	£308	£304

Source: Visit Scotland, Leisure include VFR

- Based on the postcodes of respondees to the 2012 Skye Air Service Survey and their current versus stated travel habits, approximately 34% of the inbound stimulated demand would be from outside of Scotland (the remaining being inbound to Skye but still resident in Scotland).
- Based on this additional tourism expenditure, the potential direct, indirect and induced GVA impact from the tourism spend is summarised below, with £0.2m GVA impact supporting 8 FTEs in Year 1. Over the long-term period, the GVA benefits are expected to total £3.7m in real terms, discounted to 2016.

Employment and GVA impact related to increase in inbound tourism

Employment Type	FTEs	GVA
Total (Year 1)	**8**	**£0.2 m**
Present value through to 2048		**£3.7 m**

Note: Based on 19-seats operation

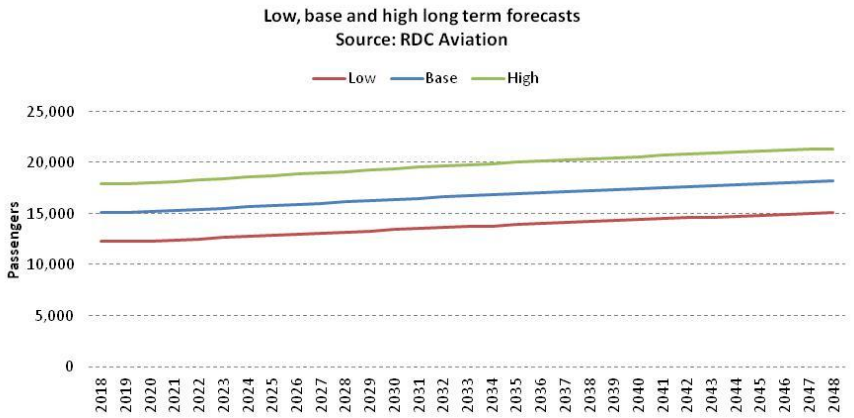
4. Traffic Forecasts

4.3 Long term forecasts – Low and High Case forecasts

Forecast outputs

- As discussed, there are boundaries within which the base case forecast could sit within year one which, if continued, would result in low and high case long term forecasts and economic benefits.

- All other factors being equal (e.g. keeping assumptions regarding operating costs, GDP, inflation etc the same), the chart below summarises the low and high case sensitivities over the long term, compared to the base case forecast. Over the next 30 years, demand would vary by approximately ±3,000 passengers per annum compared to the base case.



Long term forecast comparisons - Low, base and high

Scenario	2018	2023	2028	2033	2038	2043	2048
Low	12,279	12,656	13,201	13,726	14,227	14,681	15,098
Base	15,105	15,525	16,145	16,732	17,285	17,771	18,204
High	17,979	18,442	19,138	19,790	20,394	20,912	21,363

Note: Based on 19-seats operation

Comparison of economic benefits according to scenario

- The economic benefits discussed in detail in the preceding section were calculated on the base case forecast.

- By utilising the same methodology, but for the low and high case forecasts, the following range of economic benefits would be gained according to scenario. It should be noted that these assume similar splits in traffic profile, visitor expenditure etc.

- Benefits are, or course, highest in the 'high case' forecast given the higher passenger volume resulting in increased time saving benefits and greater inbound spend.

Comparison of economic benefits in each forecast scenario

	Low Case	Base Case	High Case
Year one passenger traffic	12,279	15,105	17,979
30 years NPV – Time saving benefits	£10.8 m	£13.2 m	£15.6 m
30 years NPV – Reduce outbound overnight benefits	£2.2 m	£2.7 m	£3.2 m
30 years NPV – Air Service Operation GVA Impact	£23.6 m	£23.6 m	£23.6 m
30 years NPV – Additional Tourism GVA Impact	£3.1 m	£3.7 m	£4.4 m

Note: Based on 19-seats operation

4. Traffic Forecasts

4.3 Wider Economic Benefits-Summary

- The introduction of direct air service from Skye could see monetised journey time cost savings compared to driving of £13.2m NPV over a 30 years period in the base case.
- Time cost-savings from reduced need to overnight in Glasgow by outbound business is estimated to be £2.7m NPV over a 30 years period
- The direct, indirect and induced GVA impact of the air service/airport operation is estimated to be £23.6m NPV over a 30 years period
- GVA impact from additional tourism spending from stimulated inbound trips to Skye is estimated to be £3.7m NPV over a 30 years period in the base case.
- A direct air service from Skye is estimated to create 31 direct, indirect and induced FTE's. In addition , 8 FTE could be supported in Skye from the additional tourism spend.
- In addition to the monetised benefits, additional catalytic and social benefits could be expected from increase business efficiencies, which could lead among others to better business links, inward investments and regional cohesion. Although these positive impacts are not quantifiable, they are important and could contribute significantly towards Skye GVA in the long term.

5. Development Strategy

5. Development Strategy

5.1 Development Approach

- The following table sets out the key steps and activities likely to be needed through to commencement of services along with an approximated timeline for these activities.
- Key uncertainties associated with the delivery and schedule are the time required to gain approval from the CAA for Instrument Flight Procedures (IFP) and the time to secure funding, governance and operational management approvals. As the existing airstrip is currently used for flight operations we have assumed that neither an Environmental Impact Assessment (EIA) or Environmental Scoping document will not be required, and that planning consents can be reasonably achieved in the timescales set out below.
- For the reasons set out above, we consider that a 2-year programme is likely to be the shortest timescale that could be reasonably achieved gain licences and approvals, construct new facilities, set up an aerodrome operating team, sign agreements with airline operators and commence scheduled air services.

Timescales	Activity	Comments
0 – 3 months	• Proposed aerodrome operator to define Operator Requirements and Preliminary Airfield and Operations Concepts defined. • Hold initial discussions with potential airline operators and select a design aircraft. • Hold Initial Development Meeting (IDM) discussion with CAA to discuss options with respect to CAP1122, Aerodrome Licencing and obtain guidance on scope and detail of any Air Space Change Process required under CAP725. • Undertake CP1122 associated Safety Studies and update CAP232 survey (updated as needed). • Hold formal CAP1122 Preliminary Review Meeting (PRM) with CAA and obtain approval to proceed in principal for Instrument Approach Procedure designs • Hold initial meeting with Planning and Highways Authorities.	• Costs for CP1122 associated studies approx. £40k-50k (depending on level of input from proposed aerodrome operator) • No CAA fees at PRM stage for CAP1122 or Aerodrome Licencing • Anticipated that Air Space Change Process should be confined to consultation with local stakeholders.

5. Development Strategy

5.1 Development Approach

Timescales	Activity	Comments
3 - 9 months	• Prepare Full Business Case and secure project funding • Undertake aerodrome works design • Develop IFP designs and submit to CAA. • Prepare Initial Draft Aerodrome Manual • Hold pre-application consultation meetings with Planning Authority and Consultees • Prepare screening/application submission • Develop PSO application, framework and evaluation process • Hold local consultation events associated with Air Space Change Process	• Business case includes governance, operations and updated costs following air strip condition survey • IFP detailed designs should not be commenced until runway configuration is confirmed and fixed. • CAA fees for IFP approval anticipated to be approximately £2-3k and IFP Approval take 24 months (or potentially more). • Assumes EIA and Scoping not required to support planning application
9 - 12 months	• Planning application submission and determination • Tender construction works. • Official Journal invitation for Airline Operators	
12 - 24 months	• Construction of apron, terminal, access roads and supporting infrastructure • Establish aerodrome operating company and staff training • Prepare Final Aerodrome Manual and Chart • Tender Flight Validation programme and prepare Flight Validation Plan for CAA Approval • Submit Aerodrome Licence and Flight Validate IFP designs for CAA Approval • Receive Aerodrome Operating Licence and CAA approval for IAPs following Flight Validation • PSO Tender and award service contract	• CAA fees for Aerodrome Licence anticipated to be approximately £10k. • Fees for Flight Validation programme could be approximately £6k, but CAA have not previously charged for Flight Validation Review and Approval

6. Summary

6. Summary

Key Findings

Forecast outputs

- The updated unconstrained demand for air services from Skye to Glasgow is estimated to be of the order of 23,400 passengers per annum compared to 21,500 derived in the 2013 study.
- Twin Otters, Trislanders and Dornier 228, each having a seat capacity of around 19 seats, can operate within the 750m length restrictions of the current airstrip, without significant restrictions to payload.
- The Let-410 also has a seating capacity of 19 seats but would have a severe payload restriction when operating off a runway of this length which would mean it could carry a maximum of 8 to 9 passengers on a Glasgow service. It is considered that Let-410 is unlikely to be a commercially viable aircraft to serve this route.
- The Cessna Grand Caravan in maximum seating configuration has a capacity of 13 seats and the Islander has a seating capacities 9 seats and both can operate from a 750m length runway without payload restrictions.
- A 12x weekly service for a 19-seat aircraft would have a theoretical capacity of 23,750 seats per annum and a 21x weekly service for a 9-seater aircraft would have an equivalent theoretical capacity of 20,007 seats.
- Bottom-up forecasts for the assumed start of service year of 2018 predict:
  - For 19-seater (Twin Otter) on a 12x weekly service – 15,100 passengers per annum
  - For 13-seater (Grand Caravan) on a 15x weekly service – 12,725 passengers per annum
  - For 9-seater (Islander) on a 12x weekly service – 12,725 passengers per annum
- This compares to the 2013 study equivalent 12x weekly service forecasts of 14,500 passengers per annum.

Infrastructure

- The introduction of instrument navigation approach systems provides the opportunity to significantly increase the reliability of operations in periods of low visibility. Based on experience at other airports, it is estimated that procedure might be approved by the CAA with minima of around 500-600ft based on the existing airstrip infrastructure along with RNAV procedures and associated flight information support.
- If a minima at this level is achieved, it is considered likely that potential airline operators would be able to operate services with acceptable levels of reliability in the prevailing weather conditions at Skye.
- However, further risk assessment based work on the approach procedure minima, a greater understanding of the local weather conditions and discussions with the CAA will be needed to confirm this.
- Based on this approach, modification needed to the basic runway configuration at Broadford in order to accommodate 9 – 19 seater aircraft is limited and expensive earthworks, runway extensions and clearance areas avoided.
- Investment is needed in supporting infrastructure, with largest investments needed in terminal, apron, airfield lighting and car park development.
- Two Options (A.1 and A.2), assessed in this report, identify the development needed to accommodate 9-seater and 19-seater aircraft. With appropriate detailed consideration to phasing, Option A.1 could be designed to be readily expanded at a later year to accommodate the larger aircraft without a significant cost penalty for abortive works.

6. Summary

CAPEX, Operating Costs and Airport Income.

- Capex investment of around £2.6m - £3.1m would be needed to construct additional facilities for a 9-seater aircraft and around £3.4m - £4.1m for 19-seater aircraft.
- The key difference is the increased size of terminal, aircraft apron and car parking needed for the larger aircraft.
- The estimated costs assume that the existing runway condition requires only minor patch repairs to its surface before remarking and that a non-DfT compliant security perimeter fence will be acceptable. Work is due to be carried out in the near future to assess the runway condition and the cost allowances for these items will need to be reviewed following this survey and after discussions have been held with the DfT.
- The operation of both options are likely to be similar. Option A.1, for 9-seater aircraft, has an estimated operational and maintenance cost of £460k to £560k per annum. Option A.2 costs are estimated to be only around £20k per annum higher. These estimates include staff, routine maintenance and utility costs. Of this approximately 70% of the costs are associated with staff related operating costs.
- These could be partially offset by an income of around £150k - £180k per annum from aeronautical revenue.

Commercial Model

- Based on the commercial analysis of airline costs, the required break even one-way fare (including 10% profit margin) ranges between £125-£160.
- Fares even at the lower end of this range are considered higher than the level that passengers might be willing to pay based on benchmark comparisons and the user survey feedback.
- On this basis, operation of unsubsidised services are likely, at best, to be only marginally viable. It is more likely that assistance, both financially and in terms of marketing and other support, would be needed to attract airlines to establish and maintain regular scheduled air services to Skye.
- Aircraft availability is likely to be an important issue. Operators seek to operate as few different types of aircraft as possible to simplify availability of spares and crew training. This is particularly relevant for the Let-410 and 13-set configuration of the Grand Caravan which is not commonly used in Western Europe.
- The potential return (profit) is unlikely to be large enough/attractive enough to warrant obtaining new equipment and therefore the number of potential operators will be limited.
- There is no evidence of substantial willingness to over-pay above the break even fares derived from the airline cost analysis. Therefore there is unlikely to be high potential for 'upside' for airline revenues, limiting the attractiveness for them to invest without a PSO[1] being in place to protect them contractually.
- As it is likely that the airport would require an operating subsidy, there may be an expectation by the airlines that subsidies would also extend to air services.
- Whilst PSO is likely to be the preferred model for operators, it is not the only option. Marketing support or some form of risk share may be acceptable. However, this may not achieve the guaranteed commitment to a fixed period of flying in the same way as a PSO provides.

1. PSO – Public Service Obligation. An arrangement where the cost of providing specific air services are subsidised

6. Summary

Benefit-Cost Analysis

- A range of Benefit / Cost ratio scenarios has been tested for each of Option A.1 and A.2, based on the data derived in the report.
- Option A.1 has terminal and other facilities sized for an aircraft capacity of 9-seats and therefore traffic forecast, PSO subsidy and landing fee data based on the Islander operating 21x weekly services to Glasgow has been used to derive the BCRs for this option.
- Option A.2 can accommodate aircraft up to 19-seats. The BCR assessment for this option has been based on Twin Otter (DHC-6-300) which is considered the aircraft most operators would choose to use on a Skye-Glasgow service.
- All costs and benefits expressed as a Net Present Value (NPV) use a 3.5% discount rate to 2016 prices with a 30 year evaluation period from start of services assumed to be in 2018. Construction costs are assumed to be incurred in 2017.
- CAPEX costs are based on the minimum capital investment as outlined in Section 3.4 and Operational & Maintenance costs are based on those derived in Section 3.5.
- Airline subsidies are based on the range of estimates included in Section 4.3 for Islander and Twin Otter series 300 services to Glasgow and cover requirements to support airline operating costs including airport charges.
- Airport revenues are taken at £150k (Islander) and £175k (Twin Otter) per annum from landing charges and other aeronautical and non-aeronautical revenues as discussed in the same section of the report, and increased each year in proportion to the forecast traffic growth.
- Four categories of benefits have been quantified; journey time savings, overnight stay savings, GVA impacts and increased inbound tourist spend. These four benefits have been used to derive a range of BCRs scenarios, which use Base, Upper and Lower estimates for various cost and benefit elements.
- Two sets of BCR scenarios are presented on the following tables, one including only journey time and overnight stay time benefits and a second set which include all four benefit categories.
- The GVA impact as a result of direct employment, support services/functions and supply chain activity have been estimated to create 31 additional FTE's and GVA benefits of £1.3m annually. This is assumed to be the same for both Options A.1 and A.2 as it is considered likely that the same staffing levels would be required to manage and operate the airport in both configurations.
- Tourism benefits, also derived in Section 4.4, are based on the estimate of stimulated visitor spend which is additional for Scotland as a whole. This is only a proportion of the total stimulated visitor spend within Skye as discussed in the economic appraisal section of the report.
- The net cost of CO_2 emissions for operating air services between Skye and Glasgow has been calculated and is included in the Appendix. Following guidance for the Client Steering Group this has not been included in the BCR calculations but presented separately.

6. Summary

Benefit-Cost Analysis Option A.1

- Option A.1 has terminal and other facilities sized for an aircraft capacity of 9-seats and therefore traffic forecast, PSO subsidy and landing fee data based on the Islander operating 21x weekly services to Glasgow has been used to derive the BCRs for this option.

Costs	NPV (Discount rate of 3.5% to 2016 over 30 years)		
	Base	Lower	Upper
Airport CAPEX	(£3.6m)	(£3.3m)	(£4.0m)
Airport OPEX and Maintenance	(£13.8m)	(£12.6m)	(£15.2m)
Airline subsidies	(£15.4m)	As Base	As Base
Airport Revenue	£4.6m	As Base	As Base
Total	**(£28.3m)**	**(£26.7m)**	**(£30.1m)**

Benefits	NPV (Discount rate of 3.5% to 2016 over 30 years)		
	Base	Lower	Upper
Journey time savings benefits	£10.8m	£8.8m	£12.9m
Overnight time savings benefits	£2.3m	£1.9m	£2.7m
GVA impact	£23.6	As Base	As Base
Tourism benefits	£3.2m	£2.6m	£3.8m
Total	**£39.9m**	**£36.8m**	**£43.0m**

6. Summary

Benefit Cost Analysis – Option A.1

Option A.1 Scenarios	Assumptions	BCR Time Saving Benefits only [1]	BCR All Benefits [2]
Base	All costs and benefits based on BASE values in tables on previous page.	0.46	1.41
1 - Low CAPEX & O&M	As for Base Scenario but with lower values for CAPEX and O&M cost	0.49	1.49
2 - High CAPEX & O&M	As for Base Scenario but with upper values for CAPEX and O&M cost	0.44	1.33
3 - Low Economic Benefits	As for Base Scenario but with lower values for time saving and tourism benefits.	0.38	1.30
4 - High Economic Benefits	As for Base Scenario but with upper values for time saving and tourism benefits.	0.55	1.52

[1] Includes only Journey Time Saving and Overnight Stay Savings tabulated on previous page
[2] Includes all four categories of benefit tabulated on the table on previous page

6. Summary

Benefit-Cost Analysis Option A.2

- Option A.2 has terminal and other facilities sized for an aircraft capacity of 19-seats and therefore traffic forecast, PSO subsidy and landing fee data based on the Twin Otter operating 12x weekly services to Glasgow has been used to derive the BCRs for this option.

Costs	NPV (Discount rate of 3.5% to 2016 over 30 years)		
	Base	Lower	Upper
Airport CAPEX	(£4.6m)	(£4.1m)	(£5.0m)
Airport OPEX and Maintenance	(£14.4m)	(£13.1m)	(£15.9m)
Airline subsidies	(£7.4m)	As Base	As Base
Airport Revenue	£5.2m	As Base	As Base
Total	**(£21.2m)**	**(£19.4m)**	**(£23.1m)**

Benefits	NPV (Discount rate of 3.5% to 2016 over 30 years)		
	Base	Lower	Upper
Journey time savings benefits	£13.2m	£10.8m	£15.6m
Overnight time savings benefits	£2.7m	£2.2m	£3.2m
GVA impact	£23.6	As Base	As Base
Tourism benefits	£3.7m	£3.1m	£4.4m
Total	**£43.2m**	**£39.7m**	**£46.8m**

6. Summary

Benefit Cost Analysis – Option A.2

Option A.2 Scenarios	Assumptions	BCR Time Saving Benefits only [1]	BCR All Benefits [2]
Base	All costs and benefits based on BASE values in tables on previous page.	0.75	2.04
1 - Low CAPEX & O&M	As for Base Scenario but with lower values for CAPEX and O&M cost	0.82	1.87
2 - High CAPEX & O&M	As for Base Scenario but with upper values for CAPEX and O&M cost	0.69	1.87
3 - Low Economic Benefits	As for Base Scenario but with lower values for time saving and tourism benefits.	0.61	1.88
4 - High Economic Benefits	As for Base Scenario but with upper values for time saving and tourism benefits.	0.89	2.21

[1] Includes only Journey Time Saving and Overnight Stay Savings tabulated on previous page
[2] Includes all four categories of benefit tabulated on the table on previous page

Appendix A – Discounted Airfield Infrastructure Options

Appendix A – Discounted Airfield Infrastructure Options

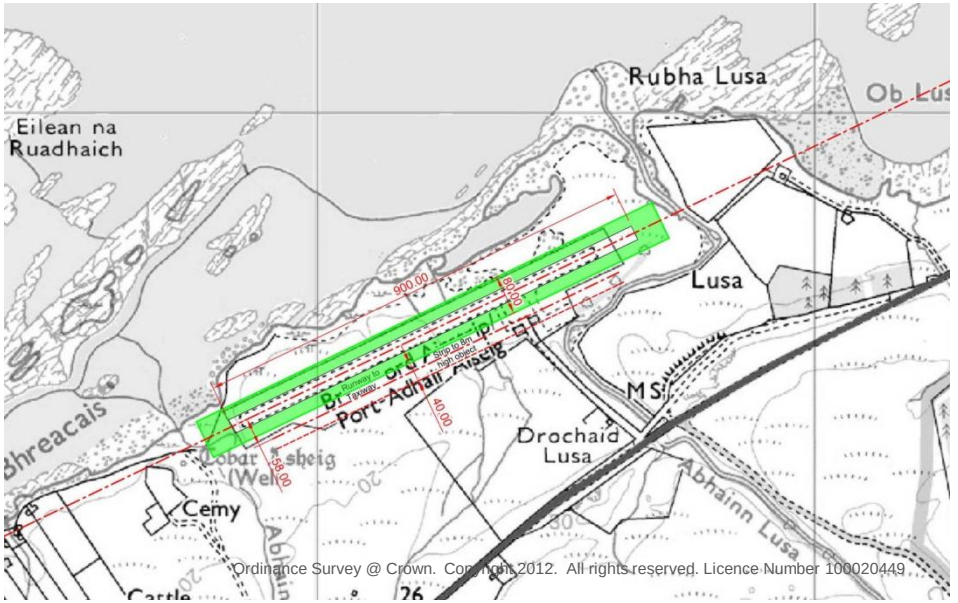
2013 Study Discounted Airfield Infrastructure Options

- The four options considered in the 2013 study require a initial Capex investment of between £4.1m - £5.0m for Option A to £15.6m - £19.1m for Option D in 2016 prices.
- The Client Steering Group have concluded that Options B-D are not currently affordable based on these updated cost estimates and are not supportable as Options A.1 and A.2 can accommodate the anticipated passenger demand in the short and medium term.
- Details of the airfield infrastructure options and associated Capex costs, updated to 2016 prices, are included in this appendix.

3. Airfield Infrastructure

3.2 Runway Options - Option B

- Option B is a lengthening of the existing airstrip to 900m long with infrastructure based on Non-Instrument requirements for a Code 2 runway as described in CAP168. This will allow larger aircraft (or reduced payload restrictions) to operate at Broadford.
- The declared distances are:
  - Rwy 07 TORA: 900m LDA 900m
  - Rwy 24 TORA: 900m LDA 900m
- No RESA's (runway end safety areas) are provided.
- The lengthening works will require re-grading of the terrain with fill to the east end where the land contours drop and culverting over the Abbhainn Ashik.
- Obstacle clearance requirements will again mean that the existing apron will not be available for parking aircraft so a new apron has been assumed.
- In addition to lengthening of the runway paved area, overlay of the existing runway pavement is assumed.
- New airfield ground lighting will be provided to the standard of a Non-Precision Instrumented runway. This will allow night time operations and safer, more reliable operations in poorer weather conditions down to the minima specified in the RNAV IAP procedures.
- A terminal and apron is included which will include facilities and equipment for Aerodrome Flight Information Services to be provided at the airport.

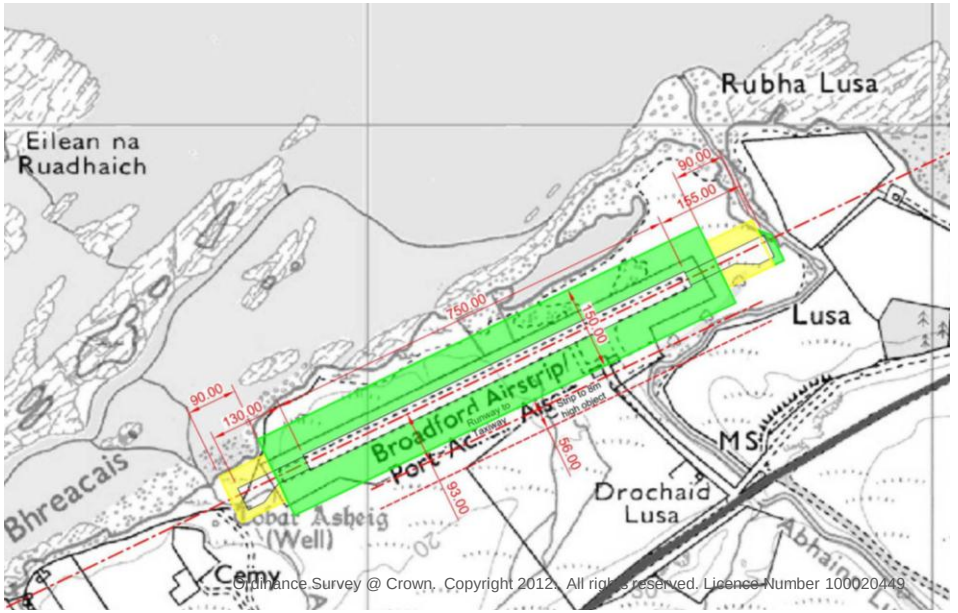


- *Option B is the longest runway (without RESA's) that can be accommodated without encroachment into the graveyard at Tobar Ashik to the east or the Abhainn Lusa watercourse to the west.*
- *It is considered that it may be possible for the CAA to permit the use of RNAV IAPs down to cloud-base minima of 500-600ft (LVP and LNAV) agl for an aerodrome of this configuration.*

3. Airfield Infrastructure

3.2 Runway Options - Option C

- Option C is the maximum length Precision Instrument Runway that can be accommodated between the graveyard site at Tobar Ashik and the Abhainn Lusa watercourse.
- As a CAP168 Instrumented Code 2 runway, RESA's are required at each end which reduces the available length for landing to the central 750m of the paved area. The Take Off Distance Available has been maximised by incorporating starter strips into the RESA's, which results in the overall paved length being 1035m.
- The declared distances are:
  - Rwy 07 TORA: 880m LDA 750m
  - Rwy 24 TORA: 905m LDA 750m
- The runway and runway strip for a Code 2 Instrument Runway is wider than for non-instrument runways with the runway 30m wide and the runway strip 150m wide.
- RESA's of 90m x 90m have been accommodated which is the minimum size required for this category of runway. However, this is smaller than the 120m recommended in CAP168.
- The wider runway strip will mean that there is significantly more earthworks and vegetation clearance needed for this option compared to the two Non-Instrument options.
- The existing runway sections are assumed to be re-surfaced.
- New airfield ground lighting will be provided to the standard of a Non-Precision Instrumented runway. This will allow night time operations and safer, more reliable operations in poorer weather conditions down to the minima specified in the RNAV IAP procedures.
- A terminal and apron is included which will include facilities and equipment for Aerodrome Flight Information Services to be provided at the airport.

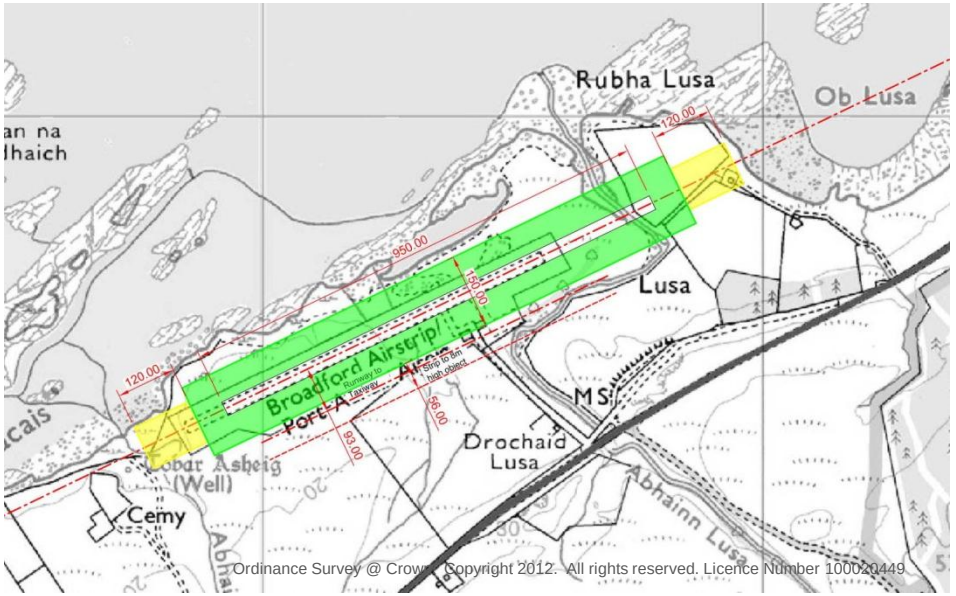


- *Option C is the shortest CAP168 standard Instrument Approach runway that can be accommodated without encroachment into the graveyard at Tobar Ashik to the west or the Abhainn Lusa watercourse to the east.*
- *The runway had the minimum mandatory RESA's required for this category of runway but falls short of the recommended length. Discussions will be needed with the CAA to confirm if these RESA lengths are considered acceptable based on the type of traffic anticipated.*
- *It is considered that it may be possible for the CAA to permit the use of RNAV IAPs down to cloud-base minima of 350-450ft (LVP and LNAV) agl for an aerodrome of this configuration.*

3. Airfield Infrastructure

3.2 Runway Options - Option D

- Option D is a CAP168 compliant Precision Instrument Code 2 runway with the full recommended 120m RESA at each end and a 950m paved runway length.
- The declared distances are:
  - Rwy 07 TORA: 950m LDA 950m
  - Rwy 24 TORA: 950m LDA 950m
- The longer RESA's make it impractical for a Code 2 runway to be accommodated between the graveyard site and the Abhainn Lusa watercourse. The eastern end therefore extends over the top of the culverted stream.
- In this option, starter strips are not included so the TORA and LDA are both the same length.
- The runway strip is similar to Option C at 150m and extends 60m beyond the paved runway. The RESA's extends beyond the end of the runway strip.
- The existing runway sections are assumed to be re-surfaced.
- New airfield ground lighting will be provided to the standard of a Non-Precision Instrumented runway. This will allow night time operations and safer, more reliable operations in poorer weather conditions down to the minima specified in the RNAV IAP procedures.
- A terminal and apron is included which will include facilities and equipment for Aerodrome Flight Information Services to be provided at the airport.



- *Option D utilises all the available land from the graveyard at Tobar Ashik to the east to the beach at Ob Lusa Bay to the west to provide a CAP168 compliant Instrumented Code 2 runway with TORA and ASDA lengths of 950m.*
- *This option is likely to have the greatest environmental impact on the coastal SSSI.*
- *It is considered that it may be possible for the CAA to permit the use of RNAV IAPs down to cloud-base minima of ~250ft (LVP and LNAV) agl for an aerodrome of this configuration.*

3. Airfield Infrastructure

3.4 CAPEX - Option B

- The minimum capital investment needed for Option B to provide an extended 900m long runway and is estimated to be approximately £5.4m to £6.6m.
- The provisions for a new terminal building, apron, car parking, and road access is the same as for Option A.2
- The major additional costs include:
  - Earthworks for lengthening the runway and runway strip.
  - A culvert structure needed for the west end extension of the runway
- As for Option A.2, a minimum allowances of £20-30k has been included for upgrades to instruments and equipment (radio, meteorological equipment etc)
- A small allowance has been included for upgrading the boundary fence to prevent stray animals entering the airfield. It is assumed that a full security fencing to protect the airfield from unauthorised persons entering is not required but this will need to be discussed with the DfT.
- No hangar has been included. If airlines are to base aircraft overnight at the airfield then they may require this to be provided. A fuel bowser is included in a secure enclosure for unplanned refuelling only.
- This estimate is considered to represent the minimum level of investment that might be required subject to successful discussions with the CAA, DfT, the potential airline operators and Fire Authorities.

Option B – cost estimated in 2016 prices	
Earthworks, drainage and vegetation removal	£1,010k-1,230k
Runway and existing apron refurbishment	£580-700k
New apron and taxiway (including mixing plant)	£420-510k
Runway extension and widening	£200-250k
Culverts and structures	£80-100k
Runway, apron and approach lighting and marking	£405-495k
Upgrade to radio, signage, meteorological equipment and windsock	£30-35k
New terminal building	£970-1,190k
Car parking and road junction upgrade	£195-240k
Rescue and Fire Fighting Service Facilities	£110-135k
Boundary fence upgrade	£30-35k
Hangar, fuel bowser	£30-35k
Preliminaries @ 18%	£720-880k
Sub-total	**£4,730-5,780k**
Contingencies @ 20%	£945-1,160k
Professional Fees @10%	£470-580k
Total	**£6,150-7,510k**

3. Airfield Infrastructure

3.4 CAPEX - Option C

- The capital investment needed for Option C to accommodate 19-seater aircraft is estimated to be approximately £11.8m to £14.4m.
- The provisions for a new terminal building, apron, car parking, and road access is the same as for Option A.2.
- The major additional costs include:
  - Earthworks for widening and lengthening the runway strip and increasing the obstacle clearances associated with the wider runway
  - A full resurfacing of the existing runway to be compatible with the new build extensions to the length and width of the runway
  - A culvert structure needed for the west end extension of the runway
- As for Option A.2, a minimum allowance of £20-30k has been included for upgrades to instruments and equipment (radio, meteorological equipment etc).
- A 3m high chain link perimeter fence to DfT standards has been included.
- A hangar to accommodate a single Twin Otter sized aircraft is included.
- Upgraded RFFS facilities is provided which includes a sea rescue RIB, associated garaging and enhanced staff facilities.

Option C – cost estimated in 2016 prices	
Earthworks, drainage and vegetation removal	£2,500-3,050k
Runway and existing apron refurbishment	£610-750k
New apron and taxiway (including mixing plant)	£550-680k
Runway extension and widening	£960-1,170k
Culverts and structures	£90-110k
Runway, apron and approach lighting and marking	£655-800k
Upgrade to radio, signage, meteorological equipment and windsock	£30-35k
New terminal building	£970-1,190k
Car parking and road junction upgrade	£195-240k
Rescue and Fire Fighting Service Facilities	£340-410k
Boundary fence upgrade	£390-480k
Hangar	£365-445k
Preliminaries @ 18%	£1,380-1,690k
Sub-total	**£9,035-11,040k**
Contingencies @ 20%	£1,810-2,210k
Professional Fees @10%	£905-1,105k
Total	**£11,750-14,360k**

3. Airfield Infrastructure

3.4 CAPEX - Option D

- The capital investment needed for Option D to accommodate 19-seater aircraft is estimated to be approximately £15.6m to £19.1m.
- This option has the same facilities as Option C, but has additional earthworks and pavement costs to achieve a full recommended length RESA.
- Additional cost is also included for a culvert over the Abhainn Lusa watercourse.

Option D – cost estimated in 2016 prices	
Earthworks, drainage and vegetation removal	£4,700-5,750k
Runway and existing apron refurbishment	£610-740k
New apron and taxiway (including mixing plant)	£660-800k
Runway extension and widening	£630-770k
Culverts and structures	£600-730k
Runway, apron and approach lighting and marking	£650-800k
Upgrade to radio, signage, meteorological equipment and windsock	£30-35k
New terminal building	£970-1,190k
Car parking and road junction upgrade	£195-240k
Rescue and Fire Fighting Service Facilities	£340-410k
Boundary fence upgrade	£450-540k
Hangar	£365-445k
Preliminaries @ 18%	£1,835-2,240k
Sub-total	**£12,025-14,700k**
Contingencies @ 20%	£2,400-2,940k
Professional Fees @10%	£1,200-1,470k
Total	**£15,600-19,100k**

Proposed Development Activities

Time(Months)	Activity
0 – 2	Discuss with Partners the procurement of a lead agent to co-ordinate and take forward the following activities
2 – 4	Hold discussions with airline operators to clarify design aircraft. Hold discussion with CAA for guidance on scope and detail of any Air Space Change Process required under CAP725. Hold initial meeting with Planning and Road Authority representatives.
4 – 8	Undertake initial airport works design Hold pre-application consultation meetings with Planning Authority and Consultees Prepare screening/application submission Hold local consultation events associated with Air Space Change Process
8 -12	Planning application submission