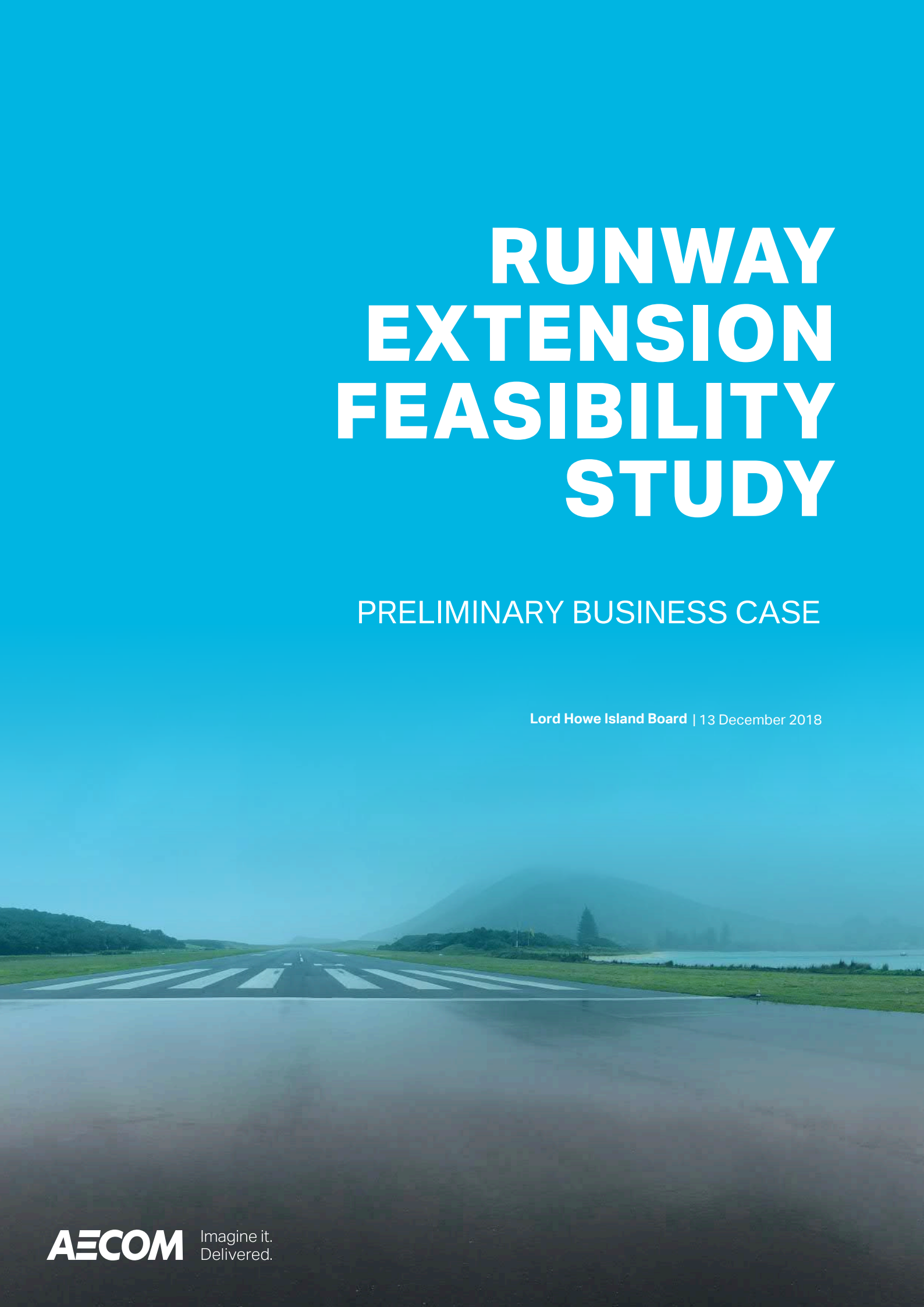
RUNWAY EXTENSION FEASIBILITY STUDY

PRELIMINARY BUSINESS CASE

Lord Howe Island Board | 13 December 2018



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Lord Howe Island Preliminary Business Case

Client: Lord Howe Island Board

Co No.: N/A

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13-Dec-2018

Job No.: 60559990

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Quality Information

Document Lord Howe Island Preliminary Business Case

Ref 60559990

Date 13-Dec-2018

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Reviewed by Ainsley Nigro

Revision History

Rev	Revision Date	Details	Authorised	
			Name/Position	Signature
A	12-Nov-2018	Draft Issue	Jed Mills Project Manager	
B	13-Dec-2018	Final Issue	Jed Mills Project Manager	

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Executive Summary

AECOM has been engaged by the Lord Howe Island Board (LHIB, the Board) to prepare a Preliminary Business Case (PBC) assessment as part of the Lord Howe Island Airport Runway Extension Feasibility Study project. The PBC has been developed consistent with NSW Treasury Guidelines for Capital Business Cases (2008).

The Preliminary Business Case outlines the need to maintain a Regular Passenger Transport (RPT) service to Lord Howe Island (LHI) that is of a sufficient scale (i.e. 30+ seater or similar) to satisfy demand beyond 2022. Securing an RPT service is essential to support tourism (capped at 400 visitors at any time), the economic viability of the Island and the well-being of its residents.

The significance of maintaining an RPT air service has been noted as a priority in a number of NSW State Government Plans and Strategies. Retaining such a service also aligns with the NSW's State Priorities of creating jobs and building infrastructure. This proposal to extend the runway on Lord Howe Island is fully aligned with the LHIB Corporate Plan 2016-2019, which is, in turn, aligned with the Lord Howe Island Act 1953, the Lord Howe Island Community Strategy 2010-2015 and the NSW State Priorities.

Actions undertaken by the Board to date are also detailed to articulate the work done to date. Notably, given the current license expiration in March 2022, time is of the essence to secure a similar or comparable service offering that will continue to support the economy and provide visitor access.

While no stakeholder engagement has been undertaken as part of this PBC, AECOM has undertaken community consultation and discussions with key stakeholders as part of the Feasibility Study. Discussions with key agencies assisted to understand their needs and requirements, and where relevant potential interest and feasibility of various operational arrangements which informed the development of options.

Benefits of maintaining an RPT include:

- Supporting local businesses and jobs
- Retaining residents' access to services, education and social and business connections on the mainland
- Ease and choice of frequency of travel for tourists
- Revenue to support environmental programs through collection of visitor fees and charges

The options below have been considered for the period post-2022.

- Cease RPT services to Sydney and Brisbane, and rely solely on current levels of charter flights from Port Macquarie
- Introduce an RPT service from Port Macquarie and another secondary city using smaller planes.
- Buy or lease the DHC-8-200 aircraft to be operated by a suitable operator to continue RPT services from Sydney and Brisbane. Once the expected 10 year service life is finished, one of the following sub-options would occur;
  - The Island would revert back to relying solely on current levels of charter flight
  - Upgrade to a different aircraft which could use the runway without extension, at present there is no viable aircraft available to do this.
- Extend the runway using the deck on piles design option to enable operation of Code 3 aircraft (such as the ATR72 and DHC8-400) and continue 30+ seat RPT air services to Sydney and Brisbane.

The CBA was undertaken in accordance with Transport for NSW guidance on economic appraisal, as set out in *Principles and Guidelines for Economic Appraisal of Transport Investment and Initiatives*,

(March 2013), Version 1.6, (updated March 2015). It details the general appraisal parameters used in the economic analysis, the capital costs of each option, evaluates the benefits.

The BCR for the project at a discount rate of 7 percent is 0.39 (i.e. 39 cents are returned for every dollar spent). The indicators shows that since the runway extension has a BCR below 1, it is not considered an economically viable project, and that the solution to this problem may better be served through one of the service change options (if possible).

This PBC has concluded that the below options should be investigated further by the Board, prior to undertaking a Full Business Case.

- Option 2: Commercialisation of chartered flights, such as the introduction of an RPT service from Port Macquarie and another secondary city using smaller planes
- Option 3: Continue an RPT commercial air service with Code 2 aircraft, which may require that the DHC-8-200 or ATR be bought or leased and operated by a suitable operator to continue RPT services from Sydney and Brisbane. Post 2028, there are two sub-options:
  - Option 3a: Cease RPT service, reverting to the base case.
  - Option 3b: Replace DHC-8-200s with newer or upgraded Code 2 aircraft.

There are a number of matters that the Board should assess further to determine a preferred option and potentially develop a full business case. All options will require consultation with key stakeholders to refine the feasibility of each option. A full business case should be pursued if it is deemed that the preferred option will require government funding to maintain an RPT service past 2022.

1.0 Introduction

AECOM has been engaged by the Lord Howe Island Board (LHIB, the Board) to prepare a Preliminary Business Case (PBC) assessment as part of the Lord Howe Island Airport Runway Extension Feasibility Study project. The objective of this PBC is to:

- Set out the issues associated with the current length of the Lord Howe Island airport runway and the constraints this places on the type of aircraft that can service the island
- Identify the benefits of addressing this problem
- Assess and identify the most appropriate solution so that the Lord Howe Island community and visitors are able to continue to access a reliable and regular air service.

In 2016, the Board formed an Air Services Working Group 'to identify the issues concerning future access to Lord Howe Island and make recommendations that plan for future access needs', in accordance with a recommendation of the NSW Government's Visitor Economy Industry Action Plan.

The PBC has been developed drawing on research previously commissioned by the Air Services Working Group, outcomes from consultation undertaken with QantasLink, and findings from the current Lord Howe Island Airport Runway Extension Feasibility Study (of which this PBC forms part). Consistent with the status of the runway extension project proposal, development of the PBC has not involved primary research. While no stakeholder engagement has been undertaken as part of this PBC, AECOM has undertaken community consultation and discussions with key stakeholders as part of the Feasibility Study.

The following options have been considered for the period post-2022.

1. Cease RPT services to Sydney and Brisbane, and rely solely on current levels of charter flights from Port Macquarie. Although it is likely the number of charter flight visitors would increase without an RPT service to the island, for the purposes of this economic analysis current levels have been adopted.
2. Introduce an RPT service from Port Macquarie and another secondary city using smaller planes
3. Buy or lease the DHC-8-200 to be operated by a suitable operator to continue RPT services from Sydney and Brisbane. Once the expected 10 year service life is finished, one of the following sub-options would occur;
    a) The Island would revert back to Option 1, relying solely on current levels of charter flight
    b) Upgrade to a different aircraft which could use the runway without extension, at present there is no viable aircraft available to do this without significant upgrade.
4. Extend the runway using the deck on piles to enable operation of Code 3 aircraft (such as the ATR72 and DHC8-400) and continue 30+ seat RPT air services to Sydney and Brisbane.

Economic analysis of these options has been performed, with the results shown in Section 6.0.

The PBC has been developed consistent with NSW Treasury Guidelines for Capital Business Cases (2008), and comprises the following chapters:

- The case for change
- Priority of the service need
- Benefits of the service need
- Stakeholder engagement
- Analysis of the proposal
- Implementation of the proposal.

2.0 The case for service need

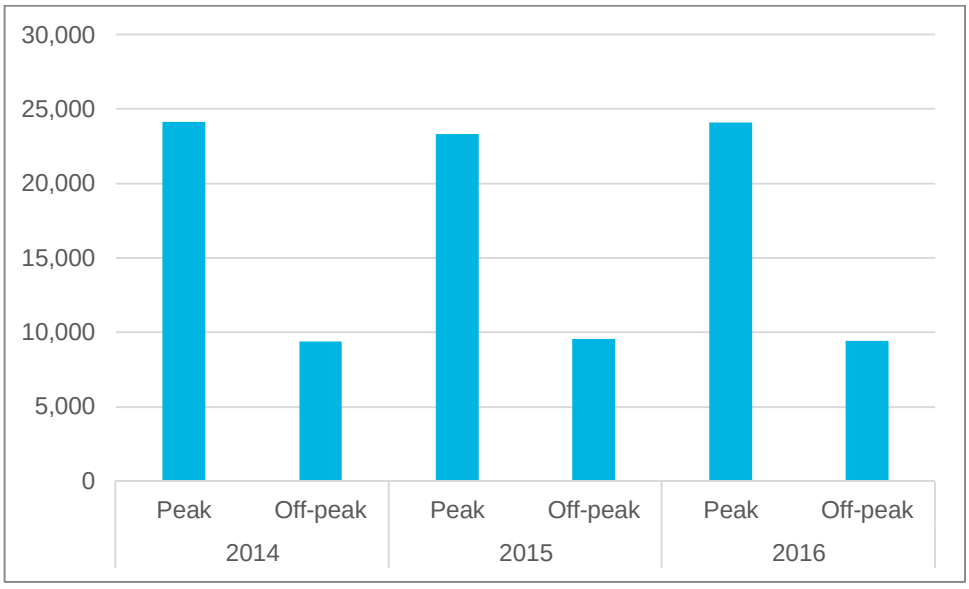
The service need is to maintain a Regular Passenger Transport (RPT) service to Lord Howe Island (LHI) that is of a sufficient scale (i.e. 30+ seater or similar) to satisfy demand beyond 2022. Securing an RPT service is essential to support ongoing tourism, the economic viability of the Island and the well-being of its residents.

Lord Howe Island (also referred to as 'the Island') is part of a World Heritage-listed island group located 590 kilometres off the coast of northern New South Wales and 790 kilometres north-east of Sydney. The Island is known for its natural beauty, bird life and pristine marine environment. The Island has a permanent population of around 380 residents (ABS 2017).

The economy of Lord Howe Island is highly dependent on tourism. Tourism is estimated to bring $27 million in annual tourist expenditure to the Island (excluding flights and pre-booked arrangements) (Gillespie, 2016). Tourism is the Island's largest source of employment. 51 percent of the Island's employed residents work in tourism related industries, with 35 percent being directly employed in the accommodation sector (ABS, 2017). Tourism is also a primary income source for the majority of small business operators on the Island.

16,000 visitors visit the Island per annum (LHIB, 2016). Visitor numbers on the Island are capped at 400 guests at any one time. This cap ensures that tourism numbers are sustainable and in line with the preservation of the World Heritage area and unique experience that the location has to offer. The peak season is defined as 30 weeks from October to April. The off-peak season is typically 22 weeks from May to September. Spend per tourist is higher in the peak season with visitors on average spending $2,083 per visit compared to an average spend of $1,371 for visitors during the off-peak season (Gillespie, 2016). It is estimated that 72 percent of visitors visit during the peak season (based on data contained in three consulting, 2017). The 400 visitor cap is often reached in the peak seasons; there is room to increase visitor numbers moderately by promoting shoulder periods, whilst still maintaining the visitor cap. Figure 1 indicates the variation in seasonal passenger numbers in recent years; it can be assumed based on the Island's remote location that most visitors will fly both in and out i.e. one visitor equals two passengers.

Figure 1 Seasonal variations in passenger numbers (2014-2016)



Source: three Consulting, 2017

Fees and levies collected from visitors are an important revenue source for the maintenance of infrastructure and services and environmental stewardship activities on the Island. LHIB, which is responsible for governing the Island (and is also tasked with a number of additional Commonwealth

and state functions), collected $1.76 million in airport user charges and an additional $300,000 from accommodation fees in 2017 (LHIB, 2017). Airport charges cover the operational costs of the airport (excluding asset renewal costs), with the surplus being distributed to support a range of environmental programs and upkeep of the Island. An environmental levy is also charged to all visitors, which directly contributes to funding environmental activities. Environmental activities are the Board's largest area in terms of operating expenses (PwC, 2013). The Board is also the largest employer on the Island with 44 full time equivalent positions in the 2016/17 year (LHIB, 2017). Tourism demand and the revenue it generates, arguably drives the need for some of these positions.

During the peak season, flights operate between Lord Howe Island and Sydney up to twice daily on weekdays and thrice daily on weekends; and a daily service to Brisbane on weekends only (16 flights per week). The number of flights reduces in the off-peak season to a daily flight to Sydney, and a once week flight to Brisbane on Sundays (8 flights per week) (three Consulting, 2017). The RPT also provides the Island's 380 residents (who comprise less than 10 percent of passengers on RPT (three Consulting, 2017)) access to medical, education and other services not available on the Island, along with access to social connections such as family and friends on the mainland. The airport is also regularly used for emergency medical operations by the Royal Flying Doctor Service (RFDS) and Royal Australian Air Force (RAAF). In addition there are two general aviation (GA) aircraft based on the Island, with occasional GA aircraft using the Island as a transit stop enroute to and from Australia and New Zealand or the Pacific islands.

Reportedly 300 to 400 charter flights arrive to the Island per year, primarily from Port Macquarie (LHIB, 2016). Charter aircraft typically carry up to 9 passengers per flight, with the potential to carry up to 14 passengers compared to 29 passengers (taking into account runway constrains) for a DHC-8-200 aircraft (Eastern Air Services CEO quoted in Port Macquarie News, 2016; three Consulting, 2017). Alternatively, the Island can be accessed by yacht or boat; however, sailings can take between 4 and 5 days from Sydney. Sailing is therefore not a common transport option, and is more frequently utilised by 'holiday sailors' than tourists to the Island.

The Lord Howe Island runway has a short declared length of 888 metres as it is constrained by the topographic and narrow landmass confines of the island. The length of the runway limits the range of aircraft that can be deployed on services to Lord Howe Island. The DHC-8-200 is currently deployed on the route. It is a 36 seater twin turboprop Code 2B aircraft, although, due to payload limitations imposed by the Island's short runway, it is typically limited to 29 passengers.

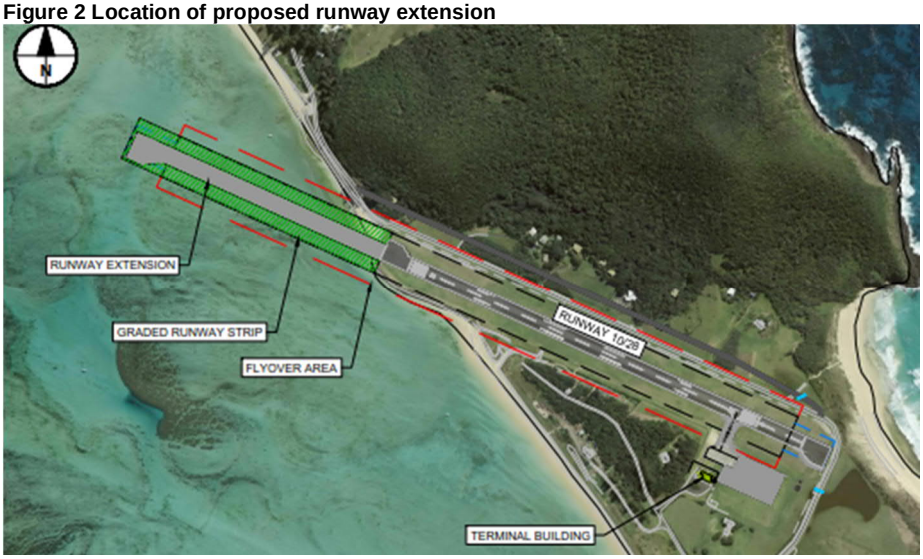
QantasLink deploys two of its three DHC-8-200s on routes to Lord Howe Island. The DHC-8-200 aircraft are ageing and will require substantial maintenance in five years' time. QantasLink has voiced its commitment to servicing the route, signing a lease extension from March 2018 to March 2022; however, while the route is currently profitable, the economic viability of QantasLink operating the DHC-8-200s on the route is reportedly diminishing (three Consulting, 2017). QantasLink has indicated it will no longer be operating the DHC8-200 aircraft within its fleet beyond March 2022 and therefore will be unable to service the Island.

AECOM's (2018a) assessment of suitable aircraft identified that the DHC-8-200 is the only 30+ seater aircraft currently in operation in Australia that can land on the existing runway and be commercially viable. Beyond the three aircraft owned and operated by QantasLink, there are a limited number of other DHC-8-200 aircraft in Australia. Early investigations indicate that there may be another suitable Code 2 aircraft. The ATR42S has been identified as potentially being able to meet the operating requirements of the runway. It is a short take-off and landing (STOL) version of the existing ATR42 aircraft. Some caution is prudent nonetheless. ATR (the company that manufactures the aircraft) has not committed to building the ATR42S and has not provided AECOM with the expected performance characteristics. Further investigation of the aircraft's compatibility with the runway would be beneficial and as far as known, no operator in Australia has plans to obtain the aircraft. Notwithstanding, the ATR42S may still be a potential option.

Given the uncertainty over the future of RPT services to Lord Howe Island, the Lord Howe Island Board (the Board), which owns Lord Howe Island Airport and governs many functions on the Island,

has for the past eight years been in discussions with key stakeholders about potential future options. The Board has commissioned a number of assessments to identify alternative aircraft (as mentioned above), financing and operations to continue RPT beyond the expiration of the current RPT license. Most recently, in 2017, the Board, in conjunction with Destination NSW, Transport for NSW and Infrastructure NSW commissioned a feasibility study for the possible extension of the runway in order to accommodate larger aircraft. The Board received $450,000 in funding from NSW Restart to investigate options and the impacts of lengthening the runway. Two design options were considered; the footprint of the extension is shown in Figure 2. One of these options, which entailed extensive land reclamation, has been removed as an option given its relatively higher construction costs, longer construction period and impacts to the lagoon and coastal processes. It has not been considered further. The structural deck on piles design has been assessed as the extension option in this PBC.

Figure 2 Location of proposed runway extension



Source: AECOM, 2018, Runway Extension Feasibility Study - Concept Design Report.

The above background, past assessments and engagement with stakeholders have informed the development of options that have been analysed as part of this PBC. Options for air services post-2022 include:

1. Cease RPT services to Sydney and Brisbane, and rely solely on current levels of charter flights from Port Macquarie. Although it is likely the number of charter flight visitors would increase without an RPT service to the island, for the purposes of this economic analysis current levels have been adopted.
2. Introduce an RPT service from Port Macquarie and another secondary city using smaller planes
3. Buy or lease the DHC-8-200 aircraft to be operated by a suitable operator to continue RPT services from Sydney and Brisbane. Once the expected 10 year service life is finished, one of the following sub-options would occur;
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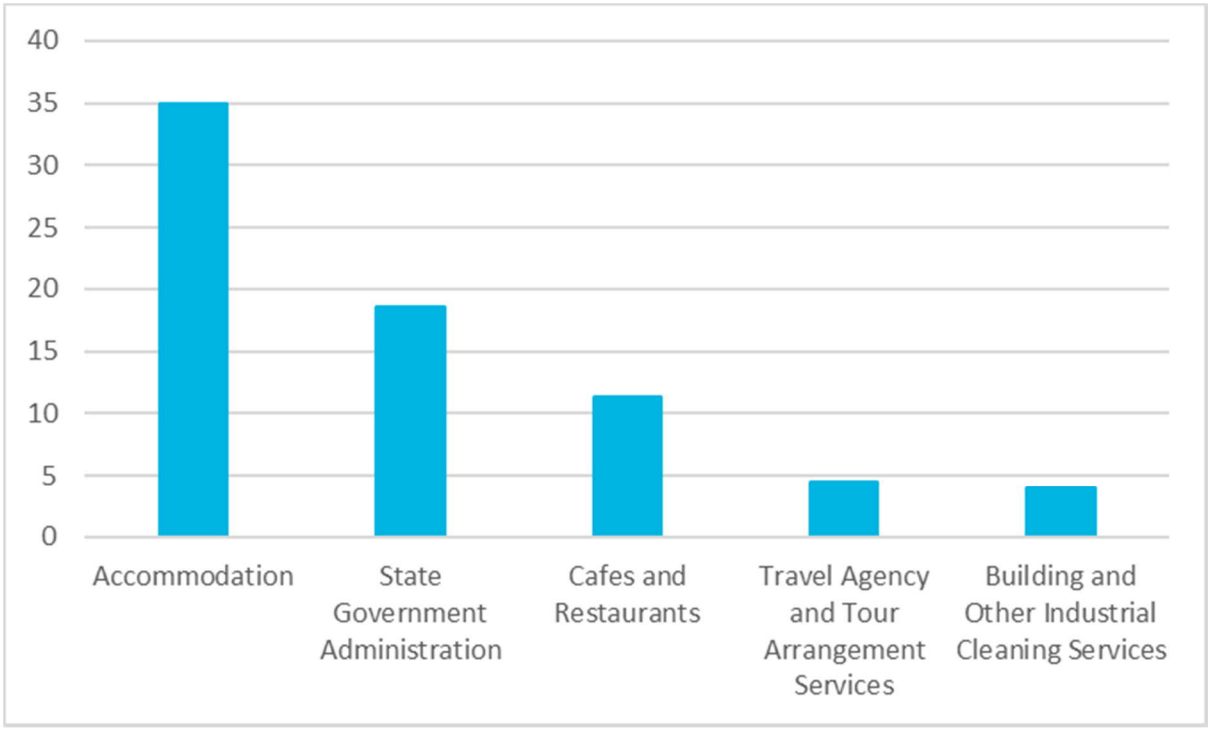
4. Extend the runway using the deck on piles design option to enable operation of Code 3 aircraft (such as the ATR72 and DHC8-400) and continue 30+ seat RPT air services to Sydney and Brisbane.

These options are discussed and analysed in further detail in section 6.0.

3.0 Priority of the service need

Tourism is the main source of employment on Lord Howe Island. Half of employed the Island's employed residents (50.8 percent) were engaged in industries that benefit from tourism (Figure 3). This is inclusive of accommodation, cafes and restaurants and travel agency and tour arrangement services (ABS, 2017). The demand that tourism places on amenity and services on the Island also contributes to the number of employees and contractors engaged by the Board, which is the largest employer on the Island with 44 full time equivalent positions in the FY2016/17 (LHIB, 2017).

Figure 3 Industry of employment (% of employed people aged 15 years and over)



Source: ABS 2017

The significance of maintaining an RPT air service to support the Island's economy and its unique tourism offering has been noted as a priority in a number of NSW State Government Plans and Strategies. Retaining such a service also aligns with the NSW's State Priorities of creating jobs and building infrastructure.

The significance of the island as a tourist destination and tourism's contribution to the Island's economy is reflected in the *Lord Howe Island Charter 1953*, the *Lord Howe Island Community Strategy 2010-2015,* and the *Lord Howe Island Board's Corporate Plan 2016-2019*. The priority of seeking a long term solution for air services was first noted as a priority in 2010 in the *Lord Howe Island Community Strategy 2010-2015*. Since then, the Board has undertaken a number of actions in conjunction with key stakeholders to ensure future access to the Island as detailed in the following.

In 2012, the NSW Government issued the *NSW Visitor Economy Industry Action Plan* in response to the recommendations of the *Final Report of the NSW Visitor Economy Taskforce*. The Action Plan proposed '[to] establish a working group to identify the issues concerning future access to Lord Howe Island and make recommendations that plan for future access needs' (Recommendation 10.E).

Subsequently, a Working Group was established by the Board Chair to investigate future options for the Island's air services. The Working Group consists of representatives of the Board, Transport for NSW, Infrastructure NSW, Destination NSW and the Department of Trade and Investment (Department of Industry).

Ensuring the adequate servicing of the island by a major airline is noted as a key action for achieving the strategic direction of a 'Strong and Sustainable Economy within the *LHIB Corporate Plan 2016-2019.* This plan aligns with the *Lord Howe Island Act 1953*, the *Lord Howe Island Community Strategy 2010-2015* and the *NSW State Priorities.* The vision is '[t]he Island community is strong and sustainable and the Island environment is protected and enhanced for the benefit of all'. In 2014 the Board also adopted an *Air Services Strategy* and has undertaken actions since then that are consistent with the strategy.

The Board (LHIB Business Paper, March 2016) has identified that the following factors are critical features that must be provided for any air service to the Island:

- A regular service with capacity to increase services in line with demand
- A minimum of a daily service with multiple flights on weekends during peak season
- A minimum of six services per week during the off-peak season
- There should be capacity and expertise to maintain and build on current annual passenger movements
- Ticket pricing should be competitive with similar routes recognising the specific constraints of the Island.

The Lord Howe Island Runway Extension Feasibility Study and maintaining air services is described as a high priority in the *North Coast NSW Destination Management Plan 2018-2021.* It is deemed that it will contribute to the strategic priority of tourism investment that will have a catalytic impact on the visitor economy (of the NSW North Coast Region) and deliver sustainable tourism development that is in balance with the community and environment. Continuing the promotion of Lord Howe Island's specific tourism experience for relevant visitor markets is another key priority in the plan.

The airport and runway have received upgrades and maintenance in recent years indicating an intention of Commonwealth and State Governments and the Board to maintain a similar or increased scale of commercial use in the future. In 2015, the runway was resurfaced and associated drainage works were completed costing $8 million. Funding was shared equally between the State and Commonwealth Governments. In 2017 a new airport terminal was completed, costing $2.5 million of which $1.8 million was funded through *Restart NSW Regional Tourism Infrastructure Program*. This was supplemented with funds from the Board's capital budget (Annual Report, 2017). The new building has been designed to be flexible to allow future changes in use of the building and tenants. It is expandable to accommodate aircrafts with larger capacities than at present.

Given the looming license expiration in March 2022, time is of the essence to secure a similar or comparable service offering that will continue to support the economy and provide visitor access. A number of the options analysed require time to be established and implemented (up to 63 months). To avoid disruption to air services from March 2022, it is crucial that significant attention is given to selecting a preferred option, undertaking further work as required and implementing the option. If not, the Island risks a lapse in RPT services even if a preferred option is being pursued. This would likely reduce the number of tourists and negatively impact the economy.

4.0 Benefits of the service need

Maintaining an RPT air service or comparable offering is expected to result in a range of social, environmental and economic benefits. These are summarised in Table 1.

Table 1 Anticipated benefits, beneficiaries and type of benefit

Benefits	Justification	Type of benefit	Beneficiaries	Expected timing
Support local businesses	In 2015 (the latest available data), there were 48 businesses operating on the Island. Of these, 46% were engaged in accommodation and food services or rental, hiring and real estate services (ABS 2016). Maintenance of existing visitor numbers and potentially growing the number of off peak visitors will benefit the local economy through tourism expenditure.	Economic	Tourism related businesses	Continual pending retaining an RPT service
Support and grow the number of jobs on the Island	Similar to the above, the majority of employed residents work in tourism related industries being: accommodation (35%), cafes and restaurants (11.3%), travel agency and tour arrangement services (4.5%) (ABS 2017). Maintenance of existing visitor numbers and potentially growing the number of off peak visitors will benefit local jobs through tourism expenditure.	Economic	Employees and their households	Continual pending retaining an RPT service
Retain residents' access to services, education and social and business connections on the mainland	Nearly a quarter of residents travelled to Sydney for medical reasons (24%), visiting friends and relatives (23%) and business (18%) (Destination NSW, 2017). Maintenance of RPT services will allow local residents to access non-emergency medical services, social connections and to conduct business.	Social	Residents	Continual pending retaining an RPT service
Tourists will benefit from an RPT service through ease of access to the Island (e.g. frequency of flights, ease of connection with other flights, aircraft comfort)	Most tourists arrive by RPT services from Sydney and Brisbane. Tourists will benefit from regular, scheduled flights with connections to other flights and aircraft comfort. Regular flights will also give tourists more options in terms of length of stays and planning holidays around other commitments.	Social	Tourists arriving by RPT	Continual pending retaining an RPT service
Generation of revenue to support environmental protection and general maintenance of the Island	In FY2017, visitor fees and charges equated to $2.06 M in revenue for the Board to carry out its functions of which environmental stewardship has the largest operating costs (LHIB, 2017; PwC, 2013). Maintenance of existing visitor numbers and potentially growing the number of off peak visitors will ensure this revenue stream continues and the Board is able to carry out its functions and environmental protection activities.	Environment	The environment. Indirectly – residents and tourists	Continual pending retaining an RPT service

5.0 Stakeholders Engagement

Table 2 identifies key stakeholders and their interest in, or perceived requirements from, the project.

Table 2 Key stakeholders and their relationship to the proposal

Stakeholder	Relationship to air service	Main interest in/requirement from the project
Lord Howe Island Board	Owner of airport	• Securing adequate access to the Island in the long-term • Supporting the Island's economy and community wellbeing • Potential changes to airport revenue and levies
Working Group Comprising representatives from Lord Howe Island Board, Transport for NSW, Infrastructure NSW, Destination NSW, Department of Trade and Investment)	Responsible for coordinated governance and funding for continued operation of airport	• Securing adequate access to the Island in the long-term • Visitor experience inclusive of flight and airport arrival • Supporting the Island economy and community wellbeing
Federal Department of the Environment and Energy	Referral agency for potential works	• Potential impacts on environment and World Heritage protection • Meeting legislative and World Heritage listing requirements
Transport for NSW	Responsible for granting license to operate route Referral agency for potential works Working Group Member	• Securing adequate access to the Island in the long-term • Licensee's potential to carry out service and contractual arrangements • Safety of air services and airport infrastructure
Destination NSW	Advocate for securing long-term access to the Island Working Group Member	• Maintaining visitor access to the Island that is convenient and reliable • Marketability and accessibility to support visitor economy • Visitor experience inclusive of flight and airport arrival
Civil Aviation Safety Authority	Regulator Referral agency for potential works	• Safety of air services and airport infrastructure • Meeting standards and legislative requirements
QantasLink	Incumbent RPT operator LHI Tourism Association Member	• Commercial viability of operations and aircraft model restrictions • Ensuring adequate infrastructure to carry out operations • Maintaining sole provision of services
Emergency air services	Air service operator – emergency	• Continued ability to operate emergency air services
Defence RAAF	Air service operator	• Continued ability to operate defence and emergency exercises
Aircraft operators – private charter jets	Air service operator	• Continued ability to carry out services • Visitor experience inclusive of flight and airport arrival
Virgin, Rex Airlines, SkyTrans, Eastern Air Services and other operators	Potential alternative air service operators	• Potential interest and ability to operate route
Lord Howe Island Tourism Association	Advocate for actions that support visitor economy and tourism businesses	• Securing adequate access to the Island in the long-term • Supporting the Island's economy and local businesses • Visitor experience inclusive of flight and airport arrival
Other tourism associations **Australian Tourism Export Council** **Tourism Transport Forum** **Tourism Accommodation Australia**	Represent the interests of tourism businesses and marketing of the Island as a unique destination	• Impact to tourist numbers the Island's visitor economy • Securing adequate access to the Island in the long-term • Impact to the environment and World Heritage listing and impact on marketing of Island to tourists • Access to the Island, including reliability of flights
Tour operators and holiday package		• Impacts on tourist numbers and viability of business • Option-specific impacts on environment and tourist activities i.e.

agents **Oxley Travel, LHI Tour and Experience Operators**		water-based activities • Securing adequate access to the Island in the long-term
Tourists	Users of aviation services and beneficiaries of service.	• Access to the Island, including reliability of flights and convenience • Cost of travel • Option specific impacts on environment and tourist activities i.e. water-based activities
Local residents	Users of aviation services and beneficiaries of service	• Environmental impacts, including noise and visual impacts • Access to services and social connections on the mainland • Effects of changes in tourist numbers on local community (increase or decrease) • Option costs and source of funding
Local businesses	RPT users and beneficiaries of service/business connections	• Changes to tourist numbers and expenditure (increase or decrease) • Convenience of business travel to mainland, as well as convenience of business deliveries and communications i.e. letters, contracts and small goods

5.1 Discussions with key stakeholders

The Board, through the Working Group, has continued discussions with QantasLink and other providers to scope the feasibility of various options. Discussions have also been held with other air service operators to assess interest and viability of operating an RPT air service. A summary of key consultations and key outcomes are noted in Table 3.

Table 3 Engagement with key stakeholders

Stakeholder	Date	Engagement method	Key concerns, agreed action
SkyTrans	2017	Discussions part of three Consulting project	Initially expressed interest in operating route.
CASA	2018	Discussion with AECOM	Recommended using the draft MOS139 update as the design standard. Minimum 90m runway end safety area's (RESA's) would have to be included in any extension
REX	2018	Discussion with AECOM	No plans to change from using a SAAB 340+ aircraft which has marginal range for LDH operations and is no longer produced.
RFDS	2018	Discussion with AECOM	Current length of runway is sufficient for operations, but an extension would make operations easier.
QantasLink	2018	Discussion with AECOM	Operations of the DHC-8-200 aircraft are expected to stop shortly after 2022. Interested in operating but their DHC-8-300 aircraft (limited life) and DHC-8-400 aircraft (still in production) would require a runway extension.
Alliance	2018	Discussion with AECOM	Moving to an all jet aircraft fleet and therefore out of contention for LHI operations
SkyTrans	2018	Discussion with AECOM	Upgrading their fleet to DHC8-200's in Oct 18, they are based in Cairns and currently operate RPT services to Northern Queensland, the Torres Strait Islands and Papua New Guinea (see 2017 consultation also). Since confirmed it is not interested in operating to LHI.
RAAF	2018	Discussion with AECOM	Current length of runway is sufficient for operations, but an extension would make operations easier.
Virgin Australia	2018	Discussion with AECOM	Standardised their turboprop fleet to ATR72-600, opposed to operating a mixed fleet.
Avation	2018	Discussion with AECOM	To establish how feasible a lease proposal would be and the indicative (rough order) costs and financial commitment. No obligations are either expressed or implied.

5.2 Community consultation

AECOM has undertaken community consultation during 2018 as part of the Preliminary Environmental Assessment for the feasibility study for the runway extension (Option 4). The following objectives and comments are specific to Option 4. Nonetheless the issues raised and the values and matters that are important to the community are broadly relevant across all options.

The objectives of the consultation were to:

- Inform the community, tourists and key stakeholders about the feasibility study through timely, understandable and accessible communication channels
- Provide early and regular engagement so that the community is informed and involved in decision-making, where relevant, in the project
- Promote the feasibility study's purpose and necessity
- Understand community, tourist and stakeholder values and opinions on environmental impacts; access to amenity and services; and social impacts of extending or not extending the runway
- Identify objections to extending the runway and potential community impacts and concerns, especially environmental issues
- Help the community, tourists and stakeholders understand that a runway extension is not a certain conclusion and that the feasibility study will help decide this.

The communication channels for consultation include;

- Updated Project webpage
- Updated Frequently Asked Questions
- Articles in The Signal newspaper
- Community update
- Article in LHIB bulletin
- Project phone number and email address for community
- Information sessions x 2
- Online feedback form
- Community consultation report (to be published on Project webpage)
- Letters to key stakeholders

The target audiences for the feasibility study were

- Local community
- Visitors
- Tourism industry
- Aviation industry

Three community consultation sessions were held in October 2018 to obtain community issues and feedback regarding environmental impacts for the proposed extended runway. The general concerns the community raised were in regards to:

- Impacts to World Heritage values
- Impacts on the coastal processes
- Climate change, particularly sea level rise
- Biodiversity and biosecurity
- Traffic and transport during construction, particularly access along Lagoon Road adjacent to the airstrip;
- Marine access in the Lagoon during construction and operation
- Amenity impacts to receivers and residents nearby such as noise and vibration and visual impacts; and
- Socio and economic impacts, particularly the impacts from additional tourists on the existing management systems on the island (waste, water, etc.), impacts on the existing 'lifestyle' perceived by residents and compensation for leaseholders for the loss of land associated with the realignment of Lagoon Road.

There were other concerns raised regarding the project cost, alternatives to the proposed runway extension and design enquiries.

The community was informed that the Preliminary Environmental Assessment was undertaken as part of a feasibility assessment of the proposed future extension of the Lord Howe Island runway. The purpose of the Preliminary Environmental Assessment is to provide an overview of potential impacts of the two design options developed for the proposed runway extension.

The concerns that were raised by the community and stakeholders, and responses to these concerns during the consultation process will be captured in a Community Consultation Report. If the preferred options, Option 4-runway extension does proceed further, these concerns would also be addressed in the Environmental Impact Statement that would be prepared for the project.

6.0 Analysis of the proposal

6.1 Objectives

The overarching objective of the proposal is to secure a long-term RPT air service to the Island that is of a sufficient scale (i.e. 30+ seater aircraft or similar) to satisfy demand beyond 2022. In turn this proposal seeks to meet the following strategic objectives:

- To retain and strengthen the unique appeal and success of Lord Howe Island as a tourism destination
- To support the Island's visitor economy. This is inclusive of:
  - Growing and diversifying local employment
  - Increasing visitor expenditure on local products and services
  - Increasing visitor numbers in line with the visitor cap for longer periods of the year
- To provide convenient and reliable travel for tourists
- To provide a 30+ seat RPT that is commercially and financially viable over the long-term for the operator and for the Board
- To secure adequate access to (non-emergency) medical and other services, and social connections for the Island's residents
- To protect the Island's land and aquatic environments and World Heritage status
- To ensure safety and other standards of the runway and operation of air services are met.

Meeting these objectives will allow the Island's economy and community to continue to benefit from tourism by facilitating convenient and comfortable travel for visitors.

6.2 Options

It is important to note the arrangements and constraints that have been identified in previous assessments (three Consulting, 2017; AECOM, 2018a) as these have informed the development of options included in this PBC. Arrangements that have been previously investigated sought to retain current or similar RPT services with no changes to the current runway. These are detailed in Table 4.

Table 4 Previously considered arrangements for continuation of RPT

Arrangement considered	Details	Conclusion
Financing alternatives to retain QantasLink and use DHC-8-200s post-2022. **(Three Consulting, 2017)**	Subsidies for QantasLink to operate DHC-8-200s through using existing levies, generating additional levies, or government operational subsidies.	Not financially feasible for the long-term. DHC—200s are no longer being built. Limited lifespan means that this aircraft may not be an option within 5-10 years.
Aircraft alternatives that could land and take-off on LHI runway, and are available in Australia. **(Three Consulting, 2017 and AECOM 2018)**	Aircraft capable of landing on existing runway are: DHC-8-100s, -200s, and potentially ATR42S. No other suitable -200s identified in Australia. Only SkyTrans operates -100s which it may replace with -200s in the future. ATR42S is not currently being manufactured and no Australian airlines have committed to operating it.	Potential for use of -100s, -200s or ATR42S on route pending further investigation of operational feasibility and other factors.
Operational alternatives to retain use of DHC-8-200s or ATR42S but use a different operator (either through purchase or lease of DHC-8-200s). **(AECOM, 2018a)**	At least 6 potential operators identified. SkyTrans initially expressed interest in operating route by either operating on its own with their own -100 fleet, codeshare with QF, or purchase of -200s from QF. SkyTrans has since confirmed that it is no longer interested in operating the route. Potential purchase or lease of DHC-8-200s or ATR42S by the government.	Potential for the government to lease aircraft. Initial discussions with Astral/Avation to investigate feasibility. Various potential operators under this scenario.

Sources: three Consulting, 2017; AECOM 2018.

In light of the above, the options described below have been considered for the period post-2022. Reducing demand is deemed not appropriate, as the objective is to maintain or slightly increase visitor numbers. It has been assumed that the Royal Flying Doctor Service, R.A.A.F. activities and general aviation (small private planes), will continue unhindered in all options.

6.2.1 Option 1 (Base Case): Cease commercial air services and retain existing charter airplanes services

This option entails the ceasing of RPT commercial services in March 2022 when the current operating agreement expires. This option assumes that there would be no direct RPT flights between Lord Howe Island and Sydney or Brisbane. Although it is likely the number of charter flight visitors would increase without an RPT service to the island, for the purposes of this economic analysis charter flights would continue as per existing arrangements, flying from Port Macquarie (1 hour 15 minute flight). There are two scheduled return charter flights per week operating on Mondays and Fridays, which use Beechcraft B200 aircraft.

Based on current operations, this option anticipates a continuation of 1080 of passengers, and flights operating between Port Macquarie and the Island. This option is expected to result in an estimated 94 percent reduction in the number of tourists visiting the Island. The runway would remain at its existing length.

6.2.2 Option 2: Commercialisation of chartered flights

This option entails scaling up the current charter flight operations to provide a level of service similar to the existing RPT service, although on smaller aircraft. This could involve the operator acquiring an RPT license to operate the route. Based on current charter flight services and operations, it is assumed that flights would depart from Port Macquarie with potential to add an additional route to another secondary city that would have some international connecting flights. It is assumed that there would be several flights per day (up to four return flights per day, maximum capacity of 36 passengers per day). This would result in the number of tourists falling by 25 percent due to reduced capacity, meaning an assumed 11,914 tourists will visit the island each year. This option is based on scaling up alternative air services operations, but does not necessarily preclude other operators who could offer a similar service. The runway would remain at its existing length.

6.2.3 Option 3: Continue an RPT commercial air service with Code 2 aircraft and another operator

Under this option, government would purchase the DHC-8-200 aircraft from Qantas in 2022 and have an airline operate these (potentially at no additional cost to government[1]) until the end of their useful life in 2028. Flights patterns will remain identical to existing conditions and patronage will be in line with the project case growth (15,922 tourists annually).

After 2028, two sub-options have been tested:

Option 3a: Base case post-2028

This scenario will revert to the base case once the DHC-8-200 aircraft are no longer operational in 2028, meaning tourism numbers will fall to 1,080 each year via charter planes from Port Macquarie.

Option 3b: Replacement Code 2 aircraft post-2028

This sub-option will bring in a new Code 2 aircraft assumed to be of similar capacity to the DHC-8-200. An example of this could be the ATR42S (subject to published operational performance being made available), however there is also a risk in planning for ATR42S as there is no commitment to build these aircraft and their potential to service the Island is not fully known. This option assumes the number of flights and timetable remains as per the existing and that flights continue to Sydney and Brisbane, and as the number of seats available are assumed to be the same as the existing service, a

[1] There is a risk that if no operator were found, there would be financially negative implications for the government; however this is considered unlikely (Discussion with Avation Re: ATR42 Lease 5 March 2018)

0.5 percent growth in patronage is assumed (15,922 tourists annually). The runway would remain at its existing length.

6.2.4 Option 4: Runway is extended and operations using DHC-8-400 series aircraft

This option involves a physical extension of 570 metres to the runway. Lengthening the runway would allow the use of larger aircraft such as the ATR 72 and DHC-8-400s which are more economically viable for commercial operators inclusive of the incumbent operator as well as other suitable operators. Given the assessment of viable aircraft into the future, lengthening the runway would enable the long term 30+ seater passenger aviation services to Lord Howe Island.

The proposed runway extension would be located on the western side of Lord Howe Island within the coral reef lagoon, extending north-west of the existing airport runway. The extension would protrude into parts of the Lagoon Sanctuary Zone. The deck on pile design would comprise of precast concrete deck panels supported on precast reinforced concrete beams and steel pile footings. Further details of the design can be found in AECOM's (2018) *Detailed Assessment of Extended Runway Requirements and Suitable Aircraft.*

It is estimated that construction would take between 12 and18 months to complete, with a total duration of design, planning, approvals and construction of between 45 and 63 months. Given the length of time required and if not commenced in a timely manner, there is potential for a service gap between the timing of the current lease ending and when the runway extension would be completed and operational. If this were to occur, it is assumed that the island would only be serviced by charter flights (i.e. Option 1: base case demand levels).

If construction commences at least 12 to18 months prior to March 2022, it is assumed that QantasLink would continue to service the Island during this period. The flight schedule would likely change, historic airfield construction projects on the island have previously reduced airfield operations to 3 days per week (i.e. capacity maintained, but in a compressed timeframe). If the extended runway is not completed by 2022, it is assumed that the number of passengers arriving during this period would reduce to base case levels until the runway is completed.

Once the extended runway is operational, as the number of tourists visiting the Island each year has been consistent, it is assumed that the use of larger planes (with the potential for cheaper airfares due to more favourable operating economics) would only attract a 0.5 percent annual growth in patronage. This is based on historic trends in tourism numbers, a slight increase in the number of visitors in the shoulder periods and retention of the 400 visitor cap.

6.3 Costs and benefits

6.3.1 Economic appraisal

The cost-benefit analysis (CBA) is an assessment of whether the incremental benefits of a 30-year appraisal period associated with the operation of an extended airport runway would exceed the whole-of-life costs of the runway extension. It is expected that the incremental benefits from the runway extension would be primarily comprised of maintaining or increasing the economic benefits of tourism to the island, while also ensuring locals have a frequent, convenient and affordable way to travel to mainland Australia.

The economic parameters for measuring the economic benefits of tourism to the island have been sourced from the *Economic Evaluation of the Lord Howe Island Rodent Eradication Project (2016)*, with supplementary information around project timing requirements and tourism numbers from the *Lord Howe Island Air Services Strategic Review and Options Report (2017).*

The results of the economic appraisal can be found in this section of the business case.

6.3.1.1 Assumptions

The CBA was undertaken in accordance with Transport for NSW guidance on economic appraisal, as set out in *Principles and Guidelines for Economic Appraisal of Transport Investment and Initiatives*, (March 2013), Version 1.6, (updated March 2015).

The general appraisal parameters used in the economic analysis are shown in Table 5.

Table 5 General economic appraisal parameters

Parameter	Value
Base price year (zero year)	2018/19
Escalation rate [(a)]	Nil
Discount year	2018/19
Real discount rate per year	7%
Construction timing [(b)]	2023-2024
First year of modelling	2018/19
First full year of benefits (post-extension)	2024/25
Last year of modelling[(c)]	2048/49
Notes: *(a) No escalation rate has been applied as per NSW Treasury Guidelines for Capital Business Cases* *(b) Actual timing would be dependent on the allocation of funding* *(c) 30-year project period based off TfNSW guidelines*	

In addition to the general parameters, the following assumptions were used in the economic appraisal:

- Benefits start accruing from the current operational year, as this includes potentially avoidable costs (i.e. the subsidy to Qantas) (assumed FY 2018/19), for 30 years.
- Options 1,2 and 3a/b are variants of the 'do minimum' project option, as the runway is not extended in any of these options.
- The economic benefit per tourist has been assumed to remain constant over the appraisal period.

6.3.1.2 Cost comparison

The costs for the two built options are outlined in Table 6. An upper and lower range (+/-30 percent) has been provided to indicate the potential range of costs and reflect the uncertainty in the estimates.

Table 6 Design cost estimates, $2018/19

Option description	Total installed cost ($AUD)	Lower range ($AUD)	Higher range ($AUD)
Option 1 (Base Case): Cease commercial air services and retain existing charter airplanes services	N/A	N/A	N/A
Option 2: Commercialisation of chartered flights	N/A	N/A	N/A
Option 3a/b: Continue an RPT commercial air service with Code 2 aircraft and another operator	N/A	N/A	N/A
Option 4: Runway is extended and operations using DHC-8-400 series aircraft	$191,100,000	$153,000,000	$249,000,000

Source: AECOM

Table 7 Option 4 – Runway extension (piled concrete deck) itemised cost breakdown

Cost item description	Cost
Subcontractors preliminaries	$12,169,226
Mobilisation – Plant and miscellaneous materials	$551,040
Mobilise work crew	$1,717,637
Supply piles and precast items and other materials to site	$69,521,936
Pile installation	$27,989,280
Place precast beams	$6,578,484
Concrete insitu stitch	$1,805,085
Other civil works	$6,576,000
Upgraded security requirements	$2,632,800
Subtotal direct costs	**$129,541,488**
Owners team costs	$3,886,245
PMC	$6,477,074
Contractors margin	$12,954,149
Contingency	$38,214,739
Subtotal indirect costs	**$61,532,207**
Total installed cost	**$191,100,000**

Source: AECOM

6.3.1.3 Value of benefits

Benefits have been calculated for all options, with Table 8 showing the total estimated economic benefits of tourism on the Island.

Table 8 Total benefits estimated to be derived from each option

Project Option	Total economic benefits (PV, $2018/19)	Incremental economic benefits (PV, $2018/19)
Option 1 (Base Case): Cease commercial air services and retain existing charter airplanes services	$29,663,352	-
Option 2: Commercialisation of chartered flights	$92,285,130	$56,115,009
Option 3a: Continue an RPT commercial air service with Code 2 aircraft and another operator (*base case post-2028)*	$67,142,556	$56,115,009
Option 3b: Continue an RPT commercial air service with Code 2 aircraft and another operator (r*eplacement Code 2 aircraft post-2028)*	$112,989,260	$30,972,435
Option 4: Runway is extended and operations using DHC-8-400 series aircraft	$101,239,959	$65,096,838

Source: AECOM

Tangible financial and economic benefits

There are a number of tangible financial and economic benefits attributed to tourism, including:

- Usual net revenue (i.e. accommodation, tours, shopping, meals)
- Airport user charges and environmental levy (collected by LHIB)
- Additional revenue from peak-season price increases.

Intangible economic benefits

There are a number of other intangible economic benefits of having an RPT air service which are not included in this assessment, however are worthwhile noting. These include:

- Benefits to residents of easier access to preventative healthcare
- Benefits to residents of easier access to mainland work, education and social opportunities
- Benefits to tourists of booking flexibility, including a potentially reduced ticket price (compared to the base case)
- Benefits to tourists in being able to visit a unique travel destination (i.e. the willingness to pay to travel somewhere with no exact substitute)
- Benefits to government of RPT access to non-emergency healthcare facilities.

6.3.1.4 Cost-benefit results

The economic appraisal results for each of the options are shown in Table 9 and are based on the cost estimates presented in Table 6.

Economic appraisal results of options

Table 9 Economic appraisal results of all options

	Option 1 (BASE CASE)	Option 2	Option 3a	Option 3b	Option 4
PV capital cost	$0	$0	$0	$0	$164,153,805
PV recurrent cost	$2,764,220	$0	$9,793,759	$29,829,592	$1,733,275
PV benefit	$36,170,121	$56,115,009	$30,972,435	$76,819,139	$65,069,838
NPV	$33,405,901	$56,115,009	$21,178,676	$46,989,546	-$100,817,242
BCR	N/A	N/A	3.16	2.58	0.39
NPVI	N/A	N/A	2.16	1.58	-0.61

Notes

- *Economic values for option 2, 3 and 4 are shown as incremental, and therefore are in addition to the base case values*

Source: AECOM

As Options 1, 2 and 3a/b are all variations of the base case, the capital cost does not change, whereas Option 4 incurs the capital cost of the runway extension (discounted to reflect construction beginning in 2023). There is an uptick in recurrent cost for Options 3a/b due to aircraft leasing costs and Option 4 as a result of the longer runway and therefore increased maintenance requirements.

It can be seen that the benefits increase as the level of air service to the island increases, to close to $77 million for Options 3b and $65 million for Option 4, with the difference due to the two years of reduced benefits between ceasing RPT operations in 2022 and the completion of the extended runway. As there is no incremental capital or recurrent cost (over and above the capital and recurrent cost of the base case), Option 2 has the highest net present value (NPV) of $59.1 million, while Option 4 has the lowest NPV of -$100.8 million (owing to the capital cost of the extension).

As Options 1 and 2 do not have an incremental capital or recurrent cost, a BCR and profitability index (NPVI) cannot be calculated for these options. Option 3a and 3b both have positive BCR and NPVI results, showing that the cost of buying and buying then leasing the aircraft generates an economically viable result. Option 4 has a BCR of 0.39 (i.e. 39 cents are returned for every dollar spent) and an NPVI of -0.61. These indicators show that as Option 4 has a BCR below 1.0 and a negative NPVI, it is not considered an economically viable project.

Economic appraisal results, Option 4

Table 10 Economic appraisal results of Option 4

	7% discount rate	4% discount rate	10% discount rate
PV capital cost	$164,153,805	$174,965,019	$154,304,180
PV recurrent cost	$1,733,275	$2,731,024	$1,114,877
PV benefit	$65,069,838	$99,746,268	$44,381,661
NPV	-$100,817,242	-$77,949,775	-$111,037,396
BCR	0.39	0.56	0.29
NPVI	-0.61	-0.45	-0.72

Source: AECOM

Under the standard analysis using a 7 percent discount rate, the BCR of the project is 0.39. When the discount rate is lowered to 4 percent, this increases to 0.56 which demonstrates the project is still not economically viable when then future is valued higher than the present.

Sensitivity analyses results

Table 11 contains the results from sensitivity testing of the Option 4.

Table 11 Sensitivity analyses results

	BCR	NPV	NPVI
Cost estimate +40%	0.28	-$166,478,764	-0.72
Cost estimate +20%	0.33	-$133,648,003	-0.68
Cost estimate -20%	0.49	-$67,986,481	-0.52
PV benefits +40%	0.55	-$74,789,307	-0.46
PV benefits +20%	0.47	-$87,803,274	-0.53
PV benefits -20%	0.31	-$113,831,210	-0.69
Delay in delivery by one year	0.42	-$89,305,180	-0.58

Source: AECOM

Under all standard sensitivity tests, the project is not considered to be economically viable, although as expected reducing the capital cost estimate and increasing the value of benefits does improve the BCR (but not enough to be above 1). Delaying the delivery date also increases the BCR in that discounting reduces the real cost of the runway extension. In reality, this may not be possible due to the increased time where an RPT service may not be running.

Wider economic benefits

No wider economic benefit analysis has been undertaken at this stage of the project.

6.3.2 Financial appraisal

As LHIB receives direct revenues from air traffic, a financial model has been prepared. This includes revenues from the environmental and passenger levies, and expenses from the ongoing maintenance of the runway (including its potential extension). The initial capital expenditure required to extend the runway has not been included in this analysis as it is assumed it would not be funded by LHIB.

An inflation rate of 2.5 percent and operational expenditure escalation rate of 3.5 percent has been applied in this analysis.

The summary of results is presented in Table 12.

Table 12 Financial appraisal summary

	Option 1 (BASE CASE)	Option 2	Option 3a	Option 3b	Option 4
PV recurrent cost (incremental)	N/A	$0	$0	$0	-$68,789
PV benefit (incremental)	N/A	$7,719,526	$3,570,788	$10,567,713	$9,273,718
NPV (incremental)	N/A	$7,719,526	$3,570,788	$10,567,713	$9,204,929
PV recurrent cost (absolute)	-$85,947	-$85,947	-$85,947	-$85,947	-$154,736
PV benefit (absolute)	$3,886,463	$11,605,989	$7,457,251	$14,454,176	$13,160,181
NPV (absolute)	$3,800,516	$11,520,041	$7,457,251	$14,454,176	$13,005,445
Source: AECOM					

The analysis shows that under all options, the assumed service offerings will provide enough tourists to the island for the airport to cover their runway maintenance costs, shown by positive NPV values.

6.4 Risk assessment

A full preliminary risk and mitigation register has been included in Appendix A, with risks relating to Options 3b and 4 presenting the largest challenges for the project. These are discussed below.

Option 4 – Environmental risks

Environmental issues associated with the potential construction and operation of a runway extension which were identified to have a medium to high risk were assessed in this preliminary environmental assessment (PEA). Environmental impacts which are predicted to be of a high significance as a result of the project include:

- World Heritage;
- Surface water (quality and hydrology);
- Coastal processes;
- Contamination;
- Climate change and flooding;
- Biodiversity and biosecurity;
- Noise and vibration; and
- Landscape and visual amenity.

The assessment identified that a runway extension has the potential to impact on the Lord Howe Island Group (LHIG) World, Commonwealth and State Heritage listings. Construction activities have the potential to affect the Island's heritage significance through the following;

- Changing the visual amenity of the area;
- Changing the land use;
- Impacts to biodiversity;
- Impacts to the environment by introducing pests and weed species;
- Affecting water and air quality; and/or
- Introducing or spreading contamination on the Island.

This PEA was limited to a desktop assessment and as such if the project is to progress, the environmental issues identified would need to be assessed in further detail including fieldwork based technical assessments

Option 4 – Planning approvals

The preliminary environmental assessment involved a review of the legislative framework which is applicable to the project, and informed a relevant approvals pathway for a proposed future runway extension project. In summary, such a project would require multiple approvals at the State and Commonwealth levels, the certainty of which is not assured due to the potential approvals risks and environmental impacts associated with the project.

Option 3b – Availability of suitable aircraft

Post 2028, it is unknown if the ATR42S or similar aircraft will be commercially available, and also be able to operate RPT services on the existing LHI runway. This uncertainty presents a significant barrier for the viability of Option 3b, even though it presents a convincing economic case.

6.5 Sustainability

Table 13 contains an overview of the sustainability impacts both positive and negative associated with each of the options, compared to the current situation. It draws on the AECOM (2018c) *Lord Howe Island Airport Runway Extension Feasibility Study – Preliminary Environmental Assessment*, Final Issue 30 October 2018, and *Stakeholder engagement – issues identification.*

The following sustainability issues have been identified as being most relevant to options proposed.

Environmental

- Impacts to World Heritage values
- Impacts on the coastal processes and vulnerability to climate change, particularly sea level rise
- Biodiversity and biosecurity.

Social

- Resident's access to education, (non-emergency) medical and other services not available on the Island
- Traffic and transport during construction, particularly access along Lagoon Road adjacent to the airstrip
- Marine access in the Lagoon during construction and operation
- Amenity impacts to receivers and residents nearby such as noise and vibration and visual impacts
- Resident/tourist balance including impacts of additional tourists (within the 400 visitor cap but potentially for longer periods) on existing management systems (waste, water, etc.), impacts on the existing 'lifestyle' perceived by residents
- Land acquisition and compensation for leaseholders for the loss of land associated with the realignment of Lagoon Road.

Economic

- Maintain and strengthening Island's economy (inclusive of business revenue, employment generation and the Board's functions and employees)
- Revenue derived from airport user charges which supports the functions of the Board.

Table 13 identifies the potential impacts that are described above (both positive and negative) associated with each option. Using the current situation for comparison, green indicates a positive change, orange is neutral or no change from existing, and red is a negative change.

Table 13 Critical environmental, economic and social constraints and opportunities

	Environment			Social					Economic	
Options	World Heritage	Coastal processes	Biodiversity	Resident access	Tourism Balance	Amenity	Marine access	Land acquisition	Economy	Board Revenue
1	-	-	-	×	×	√	-	-	×	×
2	-	-	-	-	-	-	-	-	-	-
3a	-	-	-	-	-	-	-	-	-	-
3b	-	-	-	-	-	-	-	-	-	-
4	X	x	x	√	x	X	x	x	√	√

Table 13 indicates that in terms of sustainability impacts, Options 2, 3a and 3b are generally comparable to the current situation. This includes retaining comparable access for residents, and a similar balance of tourists. These options may have similar environmental implications (both positive and negative) as the existing situation. For Option 3a after 2028, there may be a small but negligible positive impact on amenity and noise associated with the reduction in flights. As Option 1 entails a substantial reduction in the number of flights, it is considered that it would have a negative impact on access for residents, and a significant reduction in tourists. The reduction in flights may have a small negligible positive impact on World Heritage and environmental values.

Option 4, is the most likely to have negative environmental impacts. The Preliminary Environmental Assessment identifies potential impacts to various stakeholders, particularly the community. Further measures to reduce adverse effects on the environment and community and promote positive impacts will be identified in subsequent stages of the project. Potential construction works would be scheduled to minimise environmental and social impacts associated with Option 4 where possible.

6.6 Technical standards and legislative requirements

Table 14 outlines the legislation which is relevant to the options that are considered in this PBC. A full list of design standards is also referred to in AECOM's *Detailed Assessment of extended Runway Requirements and Suitable Aircraft*, April 2018 and *Basis of Design Report,* September 2018.

Table 14 Relevant legislation, standards and requirements

Jurisdiction	Relevant legislation and standards
Commonwealth	• Environment Protection and Biodiversity Conservation Act 1999
State Legislation	• Environmental Planning and Assessment Act 1979
	• State Environmental Planning Policy (Infrastructure) 2007 (ISEPP)
Local legislation and regulations	• Lord Howe Island Act 1953
	• Lord Howe Island Local Environmental Plan 2010
	• Lord Howe Island Biosecurity Strategy 2016
	• Lord Howe Island Biodiversity Management Plan (DECC, 2007)
	• Lord Howe Island Weed Management Strategy 2016-2025
	• Strategic Plan for the Lord Howe Island Group World Heritage Property 2010
	• Lord Howe Island Development Control Plan 2005
Other NSW legislation and regulations	• National Parks and Wildlife Act 1974
	• Marine Estate Management (Management Rules) Regulation 1999
	• Biodiversity Conservation Act 2016
	• Heritage Act 1977
	• Roads Act 1993
	• Protection of the Environment Operations Act 1997
	• Contaminated Land Management Act 1997
	• Civil Aviation Safety Regulations 1998 (CASR, 1998)
	• Air Transport Act 1964
Civil Aviation Safety Authority (CASA)	• Manual of Aerodrome Standards (MOS 139)

In regard to Option 4, construction would require multiple approvals at the State and Commonwealth levels, the certainty of which is not assured due to the potential approvals risks associated with the preliminary construction and the operational environmental impacts identified.

The concept design for Option 4 meets standards applicable to airfield design within Australia; this is the CASA Manual of Aerodrome Standards (MOS 139). MOS 139 is currently undergoing a detailed review; a final draft is expected to be adopted by the end of 2018. The concept designs are based on the draft MOS139; should a runway extension be commissioned on Lord Howe Island, it is highly likely the final design would be completed following approval of the draft MOS.

In addition Air Services Australia would need to approve all changes to approach, landing and take-off procedures associated with the runway extension as part of subsequent design stages.

7.0 Implementation of the proposal

7.1.1 Governance structure

The Board will ultimately be responsible for progressing this PBC through to a Final Business Case.

Project governance should involve representation of the Working Group comprising representatives from the Board, Transport for NSW, Infrastructure NSW, Destination NSW, Department of Trade and Investment.

Other key agencies and operators are expected to be consulted and engaged as appropriate.

7.1.2 Next steps and business case development plan

This PBC has concluded that the below options should be investigated further by the Board, prior to undertaking a Full Business Case.

- Option 2: Commercialisation of chartered flights, such as the introduction of an RPT service from Port Macquarie and another secondary city using smaller planes
- Option 3: Continue an RPT commercial air service with Code 2 aircraft, which may require that the DHC-8-200 be bought or leased and operated by a suitable operator to continue RPT services from Sydney and Brisbane. Post 2028, there are two sub-options:
  - Option 3a: Cease RPT service, reverting to the base case.
  - Option 3b: Replace DHC-8-200s with newer Code 2 aircraft (if available).

The following outlines key steps, major risks and consultations that the Board should undertake in determining the most suitable option and potentially pursuing a final business case.

There are several outstanding major risks to the feasibility and implementation of preferred options. These include:

- A suitable operator obtaining an RPT license
- Confirming suitability of fleet and business operations to scale charter flights to the Island
- Community acceptance of increased frequency of flights and ceasing direct flights to Sydney and Brisbane.
- Availability of suitable aircraft beyond the 10 year life span of the DHC8-200

In determining a preferred option and potentially developing a full business case, the Board should assess further:

- For Option 2, the feasibility, operational requirements and support required to implement a commercialised RPT charter flight service from March 2022. This will require consultations with suitable operators.
- For Option 3, gauge the genuine interest of an alternative suitable operator to operate a commercial air service with a DHC8-200 aircraft, as well as to investigate the likelihood of the ATR42S or other suitable aircraft being built and operated in Australia in 10 years' time. Confirmation is required that the aircraft can meet the requirements of the current runway.

Both options will require further consultation with key stakeholders to refine the feasibility of each option.

Community consultation on the above options has not been undertaken. To determine and progress a preferred option, consultation will need to articulate the costs, benefits and impacts of the preferred options assessed in this PBC. In particular, the Board should take into account the feedback on retaining flights to Sydney and Brisbane, or whether flights solely to Port Macquarie would be sufficient for future access and tourism. Another key matter for consultation is the increase in the number of flights (albeit smaller aircraft) associated with Option 2 and the potential impacts on noise and amenity.

A full business case should be pursued if it is deemed that the preferred option will require government funding to maintain an RPT service past 2022.

8.0 Reference

AECOM (2018a) *Detailed Assessment of Extended Runway Requirements and Suitable Aircraft*, issued April 2018.

AECOM (2018b) *Lord Howe Island Concept Design Report*, issued 15 August 2018.

AECOM (2018c) *Lord Howe Island Airport Runway Extension Feasibility Study – Preliminary Environmental Assessment*, Final issued 30 October 2018

AECOM (2018d) *Notes from discussion with Avation Re: ATR42 Lease 5 March 2018*.

Australian Bureau of Statistics (2017) *2016 Census QuickStats: Lord Howe Island*. Online. Available at: http://quickstats.censusdata.abs.gov.au/census_services/getproduct/census/2016/quickstat/SSC12387

Australian Bureau of Statistics (2016) *Regional Statistics by ASGS, 2011-2016, Annual (2010-11 to 2015-16). Lord Howe Island 10803. 1379.0.55.001*

Destination NSW (2017) *Lord Howe Island Visitor Survey 2017*.

Destination North Coast NSW (2018) *North Coast Destination Management Plan 2018 to 2021*.

Gillespie Economics (2016) *Economic Evaluation of the Lord Howe Island Rodent Eradication Project.*

Lord Howe Island Board (2017) *Annual Report 2016-2017*.

Lord Howe Island Board (2016) *Business Paper – Agenda Number 8 in Board Meeting March 2016 (File Ref: AI0001).*

Lord Howe Island Board (2014*) Business Paper – Agenda Number 8 in Board Meeting September 2014 (File Ref: A10023)*.

Lord Howe Island Board (2010) *Community Strategy 2010-2015*.

PwC (2013) *Financial sustainability review, Phase 1 & 2*.

Three Consulting (2017) *Lord Howe Island Air Services Strategic Review and Options (Final Draft)*, Prepared for Lord Howe Island Board.

Appendix A

Risk Register

Project stage	#	Risk	Impact	Initial risk rating			Risk mitigation strategy	Residual risk rating			Status
				Likelihood	Consequence	Rating		Likelihood	Consequence	Rating	
Planning	1	Construction approvals not granted	• Project does not proceed	Possible	Severe	High	• Regular LHIB & relevant agency interactions • Prepare detailed business case with solid reasonings • Prepare EIS	Possible	Severe	High	
	2	Private land acquisitions required and not granted	• Cost increase • Project delays • Reputational damage to LHIB	Unlikely	Moderate	Medium	• Regular LHIB & relevant agency interactions • Prepare detailed business case with solid reasonings • Design runway with minimal land acquisition.	Unlikely	Minor	Low	
	3	Environmental risk and impacts not adequately identified	• Damage to environment • Cost increase due to remediation	Possible	Moderate	Medium	• Prepare detailed environmental assessment • Liaise with environmental agencies	Possible	High	High	
	4	Delay in project program due to permits and approvals processes	• Cost increase • Project delays	Possible	Moderate	Medium	Liaise with approval and referral agencies early on to minimise delays Consider planning requirements in option design	Possible	Moderate	Medium	
	5	Lack of contractor interest results in higher than expected tender pricing	• Cost increase • Project delays	Likely	Minor	Medium	• Publish tender through multiple avenues • Invite suitable contractors to respond to tender	Unlikely	Moderate	Low	
	6	No like-for-like replacement for -200 series aircraft is available if runway is not extended	• Reputational damage to LHIB • Reduction in tourism and economic activity	Likely	Severe	Extreme	• Liaise with suitable manufacturers to understand performance standards of specific aircraft Liaise with operators to pursue operation of a suitable Code 2 aircraft	Likely	Major	High	
	7	Misalignment of preferred contractor availability and project program	• Cost increase • Project delays	Possible	Moderate	Medium	• Clear contract and performance requirements • Timely preparation and management of tender	Possible	Moderate	Medium	
	8	Logistics of mobilising to Island underestimated	• Cost increase • Project delays	Unlikely	Minor	Low	• Use LHIB experience of civil works to inform contractor in tender docs and costings • Maximise use of LHI based plant, equipment and labour	Rare	Minor	Low	
	9	Sediment plume during construction is larger than expected and damages lagoon	• Impact on lagoon environment • Cost increase due to remediation	Possible	Moderate	Medium	• Prepare environment management plan • Use of experienced overwater construction contractor	Unlikely	Minor	Low	
	10	Difficulty in sourcing materials for construction	• Cost increase • Project delays	Possible	Moderate	Medium	• Use LHIB experience of civil works to inform contractor in tender docs and costings • Ensure contingency on costings is high • Where possible, source local materials	Rare	Moderate	Low	
	11	Construction causes significant disruption to residents and local flora/fauna	• Project delays • Cost increase due to remediation • Reduction in tourism	Likely	Minor	Medium	• Prepare environment management plan • Early and continual engagement with community • Use of experienced overwater construction contractor	Possible	Minor	Medium	
Construction	12	Project budget insufficient to deliver defined project scope, or is exceeded due to variations	• Project delays • Cost increase to state • Project is not completed	Possible	Minor	Medium	• Prepare detailed costings of preferred option • Prepare and manage scope • Include contingency budget to cover unknowns	Possible	Minor	Medium	
	13	Project construction results in delays to usual airport operations	• Reputational damage to LHIB • Reduction in tourism and economic activity	Possible	Minor	Medium	• Prepare, implement and monitor construction plan • Prepare plan to minimise disruption to other airport use and operations • Use experienced overwater construction contractor	Unlikely	Minor	Low	
	14	Project delays may impact local business and economy if tourists cannot visit in expected timeframes	• Reputational damage to LHIB • Reduction in tourism and economic activity	Possible	Minor	Medium	• Manage construction timetable to minimise disruption to flights • Prepare EIS to reduce social impacts on local businesses	Possible	Minor	Medium	
	15	Economic impacts to businesses during construction	• Reduction in tourism and economic activity	Possible	Minor	Medium	• Communication and engagement with local businesses • Consider additional support if required	Possible	Minor	Medium	
	16	Transport of suitable construction material not possible within required project program timing	• Cost increase • Project delays	Unlikely	Moderate	Medium	• Source construction material in a timely manner	Unlikely	Moderate	Medium	
	17	General noise, dust and vibration during construction	• Reputational damage to LHIB • Reduction in tourism and economic activity	Likely	Moderate	High	Prepare environment management plan Specify measures to reduce negative impacts	Possible	Moderate	Medium	
	18	Inclement weather results in delays to construction program	• Cost increase • Project delays	Possible	Moderate	Medium	• Manage construction timetable, include contingency plans	Unlikely	Minor	Low	
Operation	19	Coastal erosion/disruption from extended runway	• Permanent damage to LHI • Reduction in tourism	Almost certain	Major	Extreme	• Prepare environment management plan. • Ensure effects of runway are modelled and reduced in design stage.	Likely	Moderate	High	
	20	Loss of habitat for native plants and animals	• Permanent damage to LHI • Reduction in tourism	Likely	Minor	Medium	• Prepare environment management plan. • Ensure effects of runway are modelled and reduced in design stage. • Design runway with minimal habitat encroachment.	Unlikely	Minor	Low	
	21	Damage to native flora or fauna results in negative community and visitor sentiments	• Reputational damage to LHIB • Reduction in tourism and economic activity	Likely	Minor	Medium	• Prepare environment management plan	Unlikely	Minor	Low	
	22	Runway is not sufficiently high enough to protect against climate change / storms	• Will require additional works	Unlikely	Minor	Low	• Model climate change effects against design options • Choose a conservative runway height	Unlikely	Minor	Low	

Likelihood	Consequence					
		Insignificant	Minor	Moderate	Major	Severe
	Almost certain	*Medium*	*High*	*High*	*Extreme*	*Extreme*
	Likely	*Medium*	*Medium*	*High*	*High*	*Extreme*
	Possible	*Low*	*Medium*	*Medium*	*High*	*High*
	Unlikely	*Low*	*Low*	*Medium*	*Medium*	*High*
	Rare	*Low*	*Low*	*Low*	*Medium*	*Medium*

Category	Example of qualitative measures
Almost certain	The event is expected to occur in most circumstances
Likely	The event will probably occur in most circumstances
Possible	The event might occur at some time
Unlikely	The event is not expected to occur in most circumstances
Rare	The event will only occur in exceptional circumstances

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