



Review Report

HOBART RUNWAY 30 STAR

November 2017



1. BACKGROUND

1.1 About us

Airservices Australia (Airservices) is a Government-owned organisation responsible under the *Air Services Act 1995* (the Act) for providing safe, secure, efficient and environmentally responsible services to the aviation industry. We provide the aviation industry with telecommunications, aeronautical data, navigation services and aviation rescue fire fighting services (ARFFS). In accordance with the *Airservices Act 1995*, the safety of air navigation is the most important consideration in the performance of our functions.

We provide services from two major centres in Melbourne and Brisbane, two terminal control units (TCUs), 29 air traffic control towers at international and regional airports, and ARFFS at 26 of the nation's busiest airports. In addition to this, Airservices maintains a range of aviation navigation and surveillance equipment around the country. We safely manage 11 per cent of the world's airspace where there are more than four million aircraft movements carrying more than 152 million passengers annually.

1.2 Flight path changes and review

On 14 September 2017, Airservices introduced changes to arrival and departure routes at Hobart Airport. The changes are designed to organise aircraft arriving into, or departing from, Hobart Airport onto standard routes called Standard Terminal Arrival Routes (STARs) and Standard Instrument Departure routes (SIDs).

Following implementation, concerns were raised by the community and Airservices acknowledged that adequate consultation on the changes to the new STAR flight path to Runway 30 had not occurred. In light of that, Airservices announced a review of the flight path and facilitated a community consultation session in Dunalley on 11 November 2017. The consultation session ran for four hours and was an opportunity for Airservices staff to hear residents' concerns first hand, to explain and present four alternative flight path options, and to answer specific questions residents wished to raise. Three subject matter experts were available to respond to residents' questions and provide explanations. Seventy-four people registered for the session.

A range of support materials was provided to assist the community better understand the rationale for the changes and the alternatives. A dedicated webpage available on the day of the session contained information and images depicting the proposed alternatives. A handout that included similar information was available at the session and online at Airservices website (see Appendix 1).

Community members were encouraged to provide written feedback on the proposed alternatives over a nine-day consultation period. Community members had the option of utilising an online feedback form on Airservices website or via a hard copy form which was made available at the community session. This report includes a summary of the feedback received which was used to inform Airservices decision.

The purpose of this report is to describe:

- The flight paths that existed prior to 14 September 2017– section 2
- Why changes were required – section 3
- Alternative flight paths considered as part of this review – section 4
- Community feedback – section 5, and
- Airservices decision – section 6.

2. PREVIOUS FLIGHT PATHS TO RUNWAY 30

Prior to 14 September 2017 there was no STAR and aircraft landing on Runway 30 used one of three approaches:

- An instrument approach utilising the ground-based VHF Omnidirectional Range (VOR) navigation system
- A visual approach or
- An instrument approach using area navigation (RNAV) that provides guidance to the runway in all weather conditions.

Figure 1 illustrates these flight paths and depicts one month of arrival tracks prior to the implementation of the STAR on 14 September 2017.

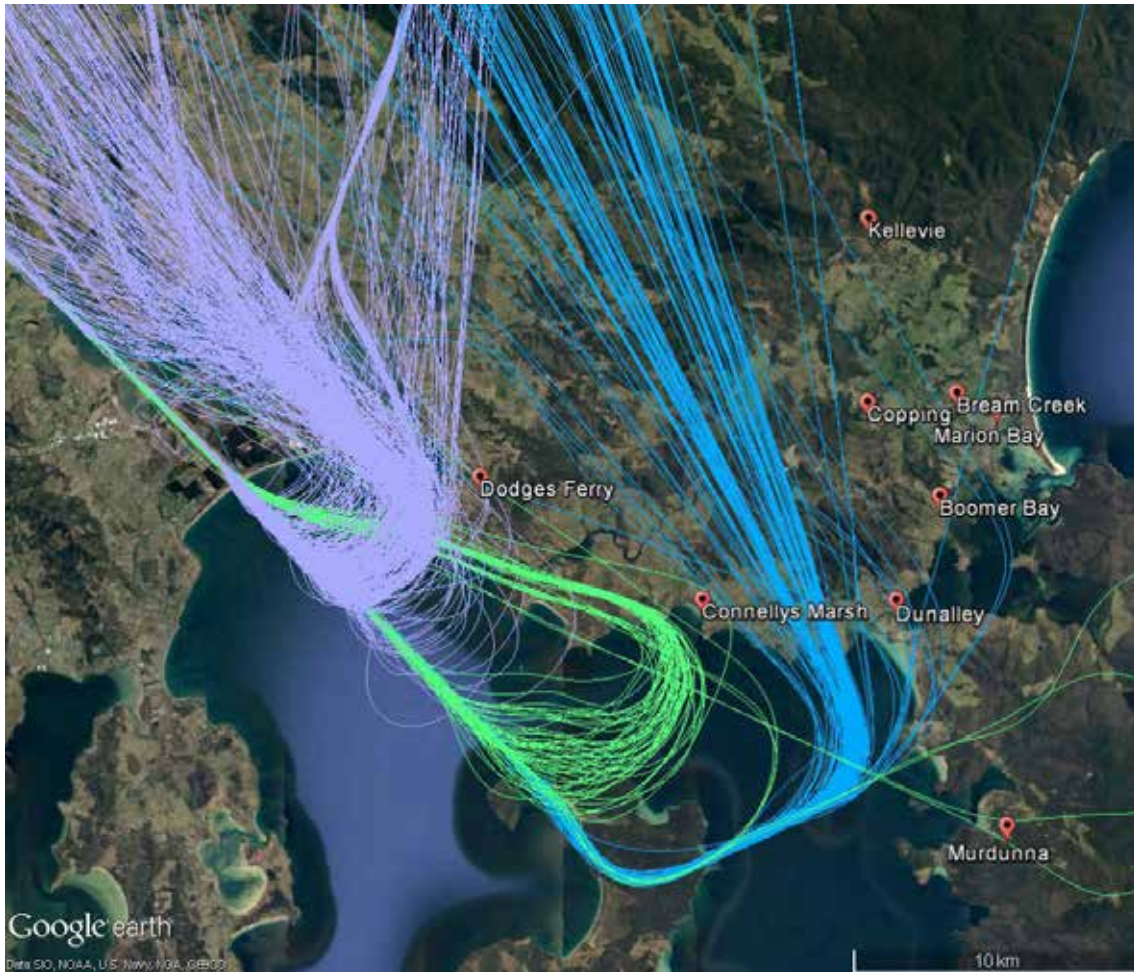


Figure 1 – Arriving aircraft to Runway 30, 14 August - 13 September 2017 (pre-change). VOR approach (green), RNAV approach (blue), visual approach (lavender)

2.1 VOR Approach

In this type of approach the aircraft uses the VOR as the primary navigational aid. The VOR emits radio signals for the aircraft to interrogate. This type of approach requires an aircraft to overfly the VOR and then circle around to realign with the runway. Figure 2 shows this procedure.

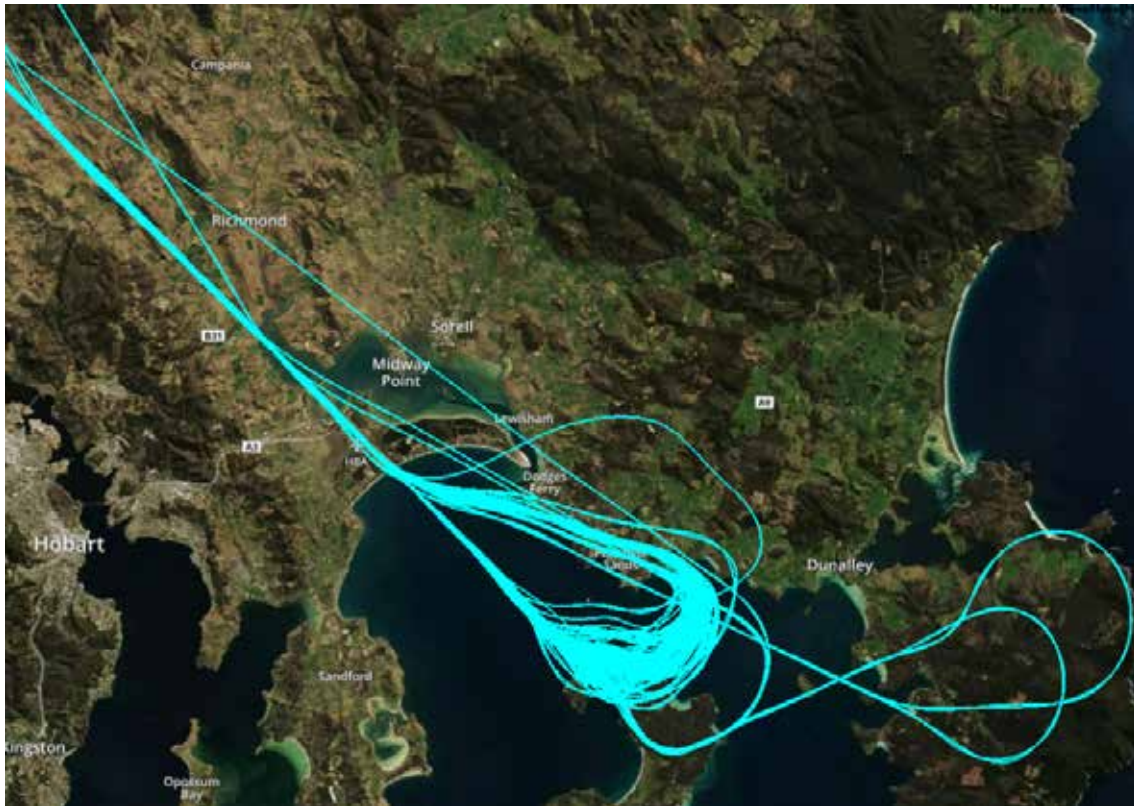


Figure 2 - Former VOR approach to Runway 30, 14 August - 13 September 2017 (pre-change)

The VOR is a legacy technology compared to the satellite-based approaches that now are available. The VOR does not provide vertical guidance, or the same degree of landing predictability and precision as satellite navigation

The Civil Aviation Safety Authority (CASA) is the Australian regulator of aviation safety standards. CASA has determined a mandate for airlines and Airservices that came into effect on 4 February 2016¹. This requires Instrument Flight Rules aircraft to transition from ground-based navigation, such as VORs, to satellite-based navigation as the primary technology.

In accordance with the mandate, Airservices is redesigning landing approaches at over 50 airports across Australia, including Hobart. Landing approaches at these airports will now rely primarily on satellite-based navigation with vertical guidance (reducing the risk of controlled flight into terrain during approach and landing).²

Ground-based navigation aids including VORs have been progressively decommissioned across the country as the transition to satellite-based navigation is implemented. A number of ground-based navigation aids, including the Hobart VOR, are being retained as a contingency in the event there is a failure of satellite navigation either in the aircraft or within the satellite network. This is known as the backup navigation network.

The Hobart VOR was located on land required by Hobart Airport for an extension of the runway. Once the new STARs were introduced, the VOR was decommissioned for relocation to a new site on the airport. When the VOR is re-commissioned as part of the back-up network, an instrument approach must be designed with reference to the VOR's new location. Once the design process is complete, the new VOR procedures must be flight tested by CASA in line with safety requirements. This process is expected to take at least three months. Once implemented, the VOR approach will be used only for contingency purposes as described above, or for "recency", that is, when a pilot needs to maintain their proficiency in using that approach.

1. Civil Aviation Order 20.18

2. <http://www.airservicesaustralia.com/projects/aircraft-navigation-modernisation-program/>

2.2 Visual Approach

The visual approach is a short approach that is flown by pilots navigating with reference to the ground. A visual approach can only be performed in visual meteorological conditions (VMC), that is, where visibility, cloud ceilings and cloud clearance meet certain minimum requirements.

To perform a visual approach aircraft tracked towards the runway using the VOR navigational aid, and, once in sight of the runway, reported “visual” and requested permission from air traffic control to make a visual approach.



Figure 3 - Visual approaches prior to the change, 14 August - 13 September 2017

Because the visual approach is so short and often not flown on auto pilot, there are more speed and height changes required and the potential for less stability on the final approach. The most stable approaches are the long approaches where aircraft fly straight in with wings level on a consistent angle of descent. Because visual approaches generally require the pilot to adjust the height and speed of the aircraft manually, it is more difficult to ensure that the aircraft is on a stable descent angle when turning onto the centreline of the runway for the final section of the approach.

When there are variations in wind speeds and direction on the final approach for the runway, an aircraft that is not set up for a consistent angle of approach and speed may need to abort the approach or “go around”, applying power to climb and then circling around to re-join the landing sequence. Air traffic controllers must tactically assure separation between aircraft in these circumstances by managing each aircraft individually.

In the two months since the new STAR was implemented, from 14 September to 14 November 2017, there was only one non-weather-related missed approach, compared to four for the same period in 2016. This 75 percent reduction illustrates the improved stability and safety offered by a STAR and is why visual and VOR approaches are not preferred when satellite-assisted approaches are available.

2.3 RNAV Approach

Area navigation (RNAV) approaches are satellite-based instrument approaches that can provide both lateral and vertical guidance to the runway. The RNAV approaches at Hobart are “straight-in” approaches.



Figure 4 - RNAV instrument approaches to Runway 30 (from south) and Runway 12 (from north)

Before the implementation of the STARs on 14 September 2017, the RNAV approaches were not “linked up” in the route structure. There was no standard flight path that could be programmed into the flight management system that an aircraft could follow to join an RNAV approach. Rather, from the point where it entered the airspace immediately surrounding the airport (“Terminal airspace” – see Figure 9), an aircraft would be individually directed by air traffic control to intercept the RNAV approach. This type of individual handling increases workload and there is less predictability for the controller and pilot. The introduction of a connected STAR enhances predictability and accuracy and therefore safety.

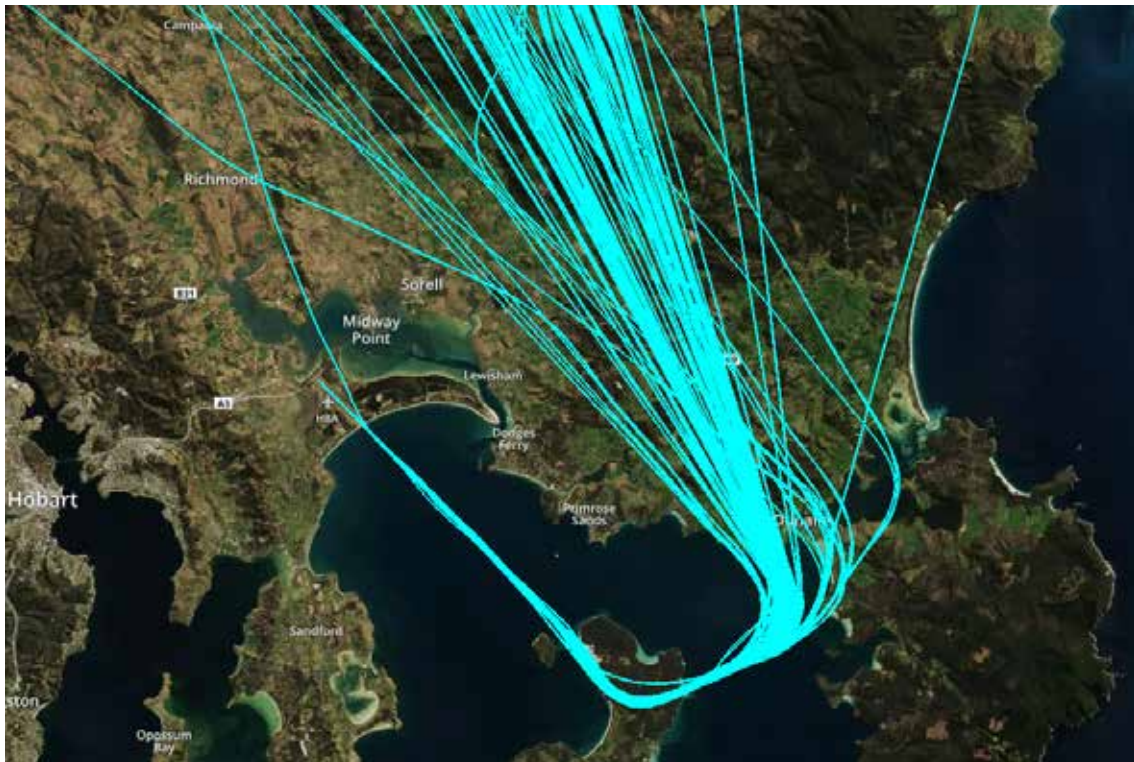


Figure 5 - Tracks of aircraft intercepting the RNAV approach, 14 August to 13 September 2017 (pre-change)

Figure 5 shows the tracks of aircraft that were individually handled to intercept the eastern arm of the RNAV approach in the month before the STAR was implemented. There were 161 RNAV arrivals in the illustrated time period.

3. NEED FOR CHANGE

Airservices introduced the changes to flight paths at Hobart Airport to improve safety for the travelling public. There were a number of factors that influenced the change.

In June 2015, the Civil Aviation Safety Authority (CASA) conducted an audit at Hobart Tower and raised an Observation recommending that Airservices conduct a review of the route structure in both high level and low level airspace to ensure that any unnecessary crossovers and undue complexity were minimised or removed.

During 2016, CASA conducted an *Aeronautical Study of Hobart* and released a report in February 2017.³ Recommendation 3 of the report supported the route redesign work that was underway at that time:

To improve efficiencies and predictability, taking into account Performance Based Navigation requirements Airservices should continue redesign work for flight routes into and out of Hobart, make improvements to existing Terminal Instrument Flight Procedures (TIFPs) and introduce STARs into Hobart.⁴

As referenced in Section 2.1, a CASA mandate came into effect on 4 February 2016⁵. This requires Instrument Flight Rules aircraft to transition from ground-based navigation to satellite-based navigation as the primary technology and this requires changes to flight paths.

Around this time, Hobart Airport had also begun work on the extension of one of the two runways at the airport. The ground-based navigation aid (the VOR) was located on land that the airport required for extension the runway. Airservices therefore had to remove the aid from the land and from use by aircraft flying into the airport. This ground-based navigation aid was then replaced by satellite-based navigation, which requires SIDs and STARs.

The VOR will be relocated and re-commissioned at an alternative site at Hobart Airport, but only as part of the back-up network, for use should the satellite-based navigation be temporarily unable to be utilized.

4. ALTERNATIVES

The following constraints exist when considering alternatives for the flight path:

- A Standard Terminal Arrival Route (STAR) enhances safety by building in the required distances between aircraft, and ensuring consistency and predictability of arrival movements
- The flight path must be designed to international safety standards that have been adopted for Australia by the airspace regulator, the Civil Aviation Safety Authority
- There must be an arrival flight path to the southern end of the runway that caters for aircraft coming from both the east and west coasts of Australia
- This flight path must join up to the pre-existing area navigation (“RNAV”) instrument approach path, which provides guidance to the runway in all weather conditions
- The turn onto the RNAV flight path must be between 70 and 90 degrees to meet aircraft performance and safety requirements
- The arrival flight path must cross over the departure flight path at a location that allows aircraft to safely descend and climb on their respective flight paths
- The flight path must remain inside “controlled airspace”

In general terms, flight paths must also allow the efficient sequencing and management of aircraft in the broader network by air traffic control, meet aircraft descent performance requirements and minimise fuel burn and emissions as much as possible.

3. *Aeronautical Study of Hobart*, Civil Aviation Safety Authority, February 2017

4. *Ibid*, Recommendation 3 at p.35

5. Civil Aviation Order 20.18

4.1 Alternative 1: Current STAR to Runway 30

Figure 6 shows the tracks of regular public transport jet aircraft flying the current STAR (Alternative 1) between 14 September and 13 October 2017:

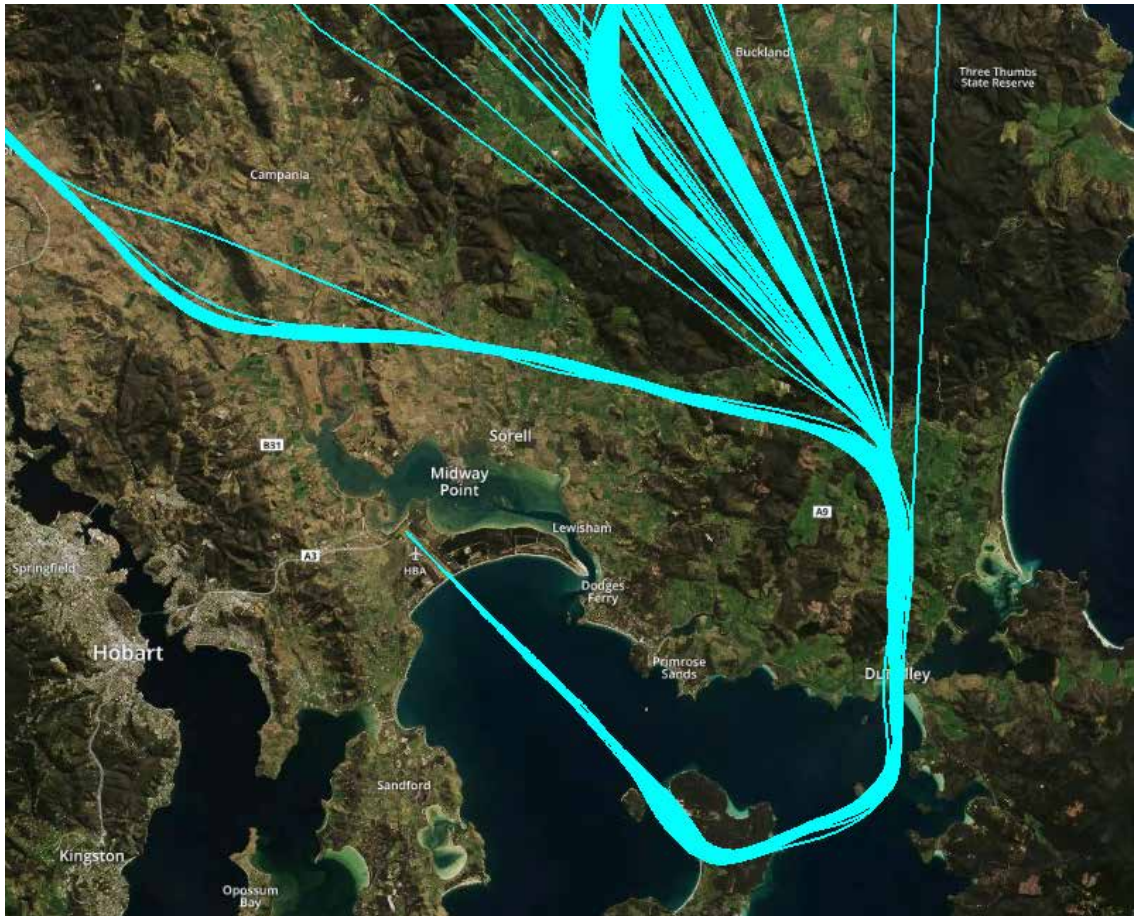


Figure 6 – Tracks of aircraft flying the current STAR (Alternative 1), 14 September – 13 October 2017

The noise impacts of the current flight path (Alternative 1) and the effects of the concentration of aircraft into one consistent flight path have been reported in Dunalley, Copping, Kellevie, Bream Creek, Marion Bay, Boomer Bay, Murdunna and Sloping Main. There are an indicative 180 dwellings within a 1km buffer to either side of the flight path.⁶

4.1.1 Usage analysis

Between 14 September and 17 November 2017 the flight path was used on all but two days. Because aircraft must take off and land into the wind, the wind and weather conditions play a key role in whether or not the flight paths to each runway are used on any given day. There are about 28 regular public transport (RPT) flights to and from Hobart each day. Runway 30 usage peaked on 10 October with 32 movements, of which 27 were RPT, two were medical and three were private flights. There were 29 flights on 6 November including 26 RPT, one medical and two military flights, and on 1 October three medical flights again brought the number of flights to 29 with 26 being RPT. There were 28 movements on 29 September and 9 October, all RPT in each case.

The usage of Runway 30 has dropped considerably in November compared to September and October. This reflects the typical usage pattern that results from seasonal winds. Runway 30 is typically used less frequently in the summer months when southerly winds tend to be more prevalent. Southerly winds favour use of the opposite runway direction, Runway 12.⁷

6. 2016 Census, Australian Bureaus of Statistics. Note that the dwelling count is indicative only and may not reflect actual numbers because of the uneven distribution of population in rural areas.

7. More information on this topic is available in the Runway Selection fact sheet: http://www.airservicesaustralia.com/wp-content/uploads/12-139FAC_NCIS-Runway-selection_P2.pdf

Figure 7 illustrates the variation in runway usage on any given day. While Runway 30 was clearly used for whole days on those days with high numbers of flights, on days where movements were low this indicates that Runway 30 was only used for part of the day.

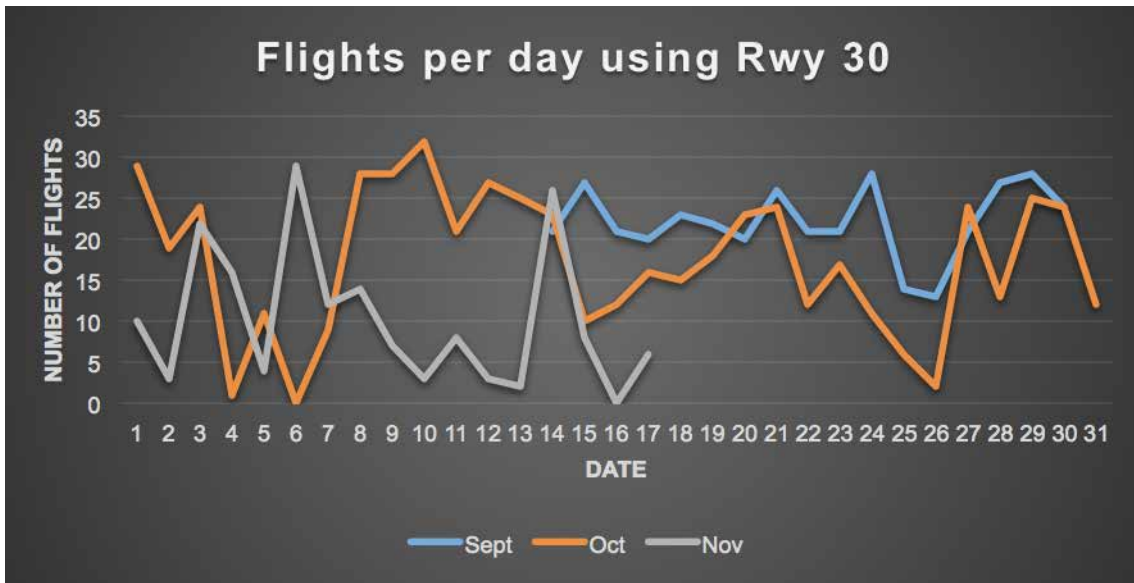


Figure 7 - Number of flights per day 14 September - 17 November 2017

4.1.2 Average Altitudes

Between 14 September and 17 November 2017 the average altitude of aircraft over Kellevie was 7144 feet (2177 metres). Over Copping the average was 6302 feet (1921 metres). Aircraft over Dunalley were on average at 5412 feet (1649 metres).

4.2 Alternative 2

This proposal would move aircraft further away from affected areas starting from Kellevie in the north to Dunalley in the south. In Figure 8 Alternative 2 is shown in green. The pre-existing, unchanged RNAV flight path is shown in red.

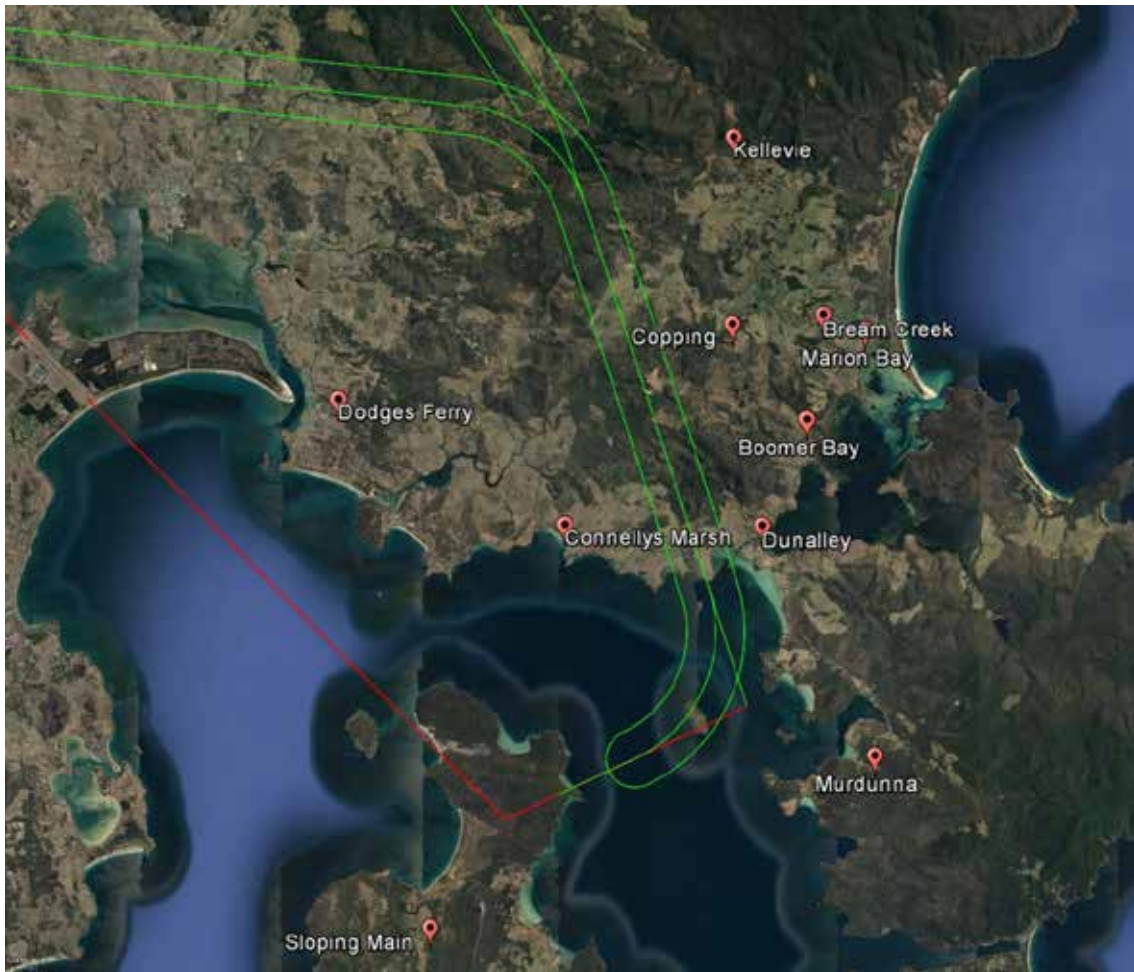


Figure 8 - Alternative 2

Alternative 2 replicates, as far as is possible, the “long approach” that was previously flown by aircraft with air traffic control individually directing pilots to intercept the RNAV approach (see Figure 5). There are an indicative 91 dwellings within a 1km buffer to either side of the flight path.⁸

While communities such as Dunalley, Copping and Kellevie would no longer be overflown by Alternative 2, aircraft are likely to continue to be heard, especially at the southern end of the flight path. Dunalley residents would notice aircraft tracking on average 1 kilometre west of the current flight path and around 1.5 kilometres west of the south-western edge of the township.

Residents of Connellys Marsh may notice arriving aircraft tracking closer than before at between 3 to 4 kilometres from the eastern edge of the township. The current arrival flight path is between 4 and 5 kilometres from the eastern edge.

Residents of Murdunna and Sloping Main would notice little change from Alternative 2 compared to the current flight path (Alternative 1). While not overflown, these areas will continue to notice the effect of the concentration of all arrivals into the one flight path.

8. 2016 Census, Australian Bureaus of Statistics. Note that the dwelling count is indicative only and may not reflect actual numbers because of the uneven distribution of population in rural areas.

4.3 Alternatives 3 and 4

Alternative 3 would be used by aircraft coming from north eastern ports such as Sydney and Brisbane. Alternative 4 would be used by aircraft coming from southern and western ports such as Melbourne, Adelaide and Perth.

Alternatives 3 and 4 would require airspace redesign. Flight paths for large commercial passenger aircraft must be in “controlled airspace”. These alternatives are outside controlled airspace. Figure 9 below shows controlled airspace in green.

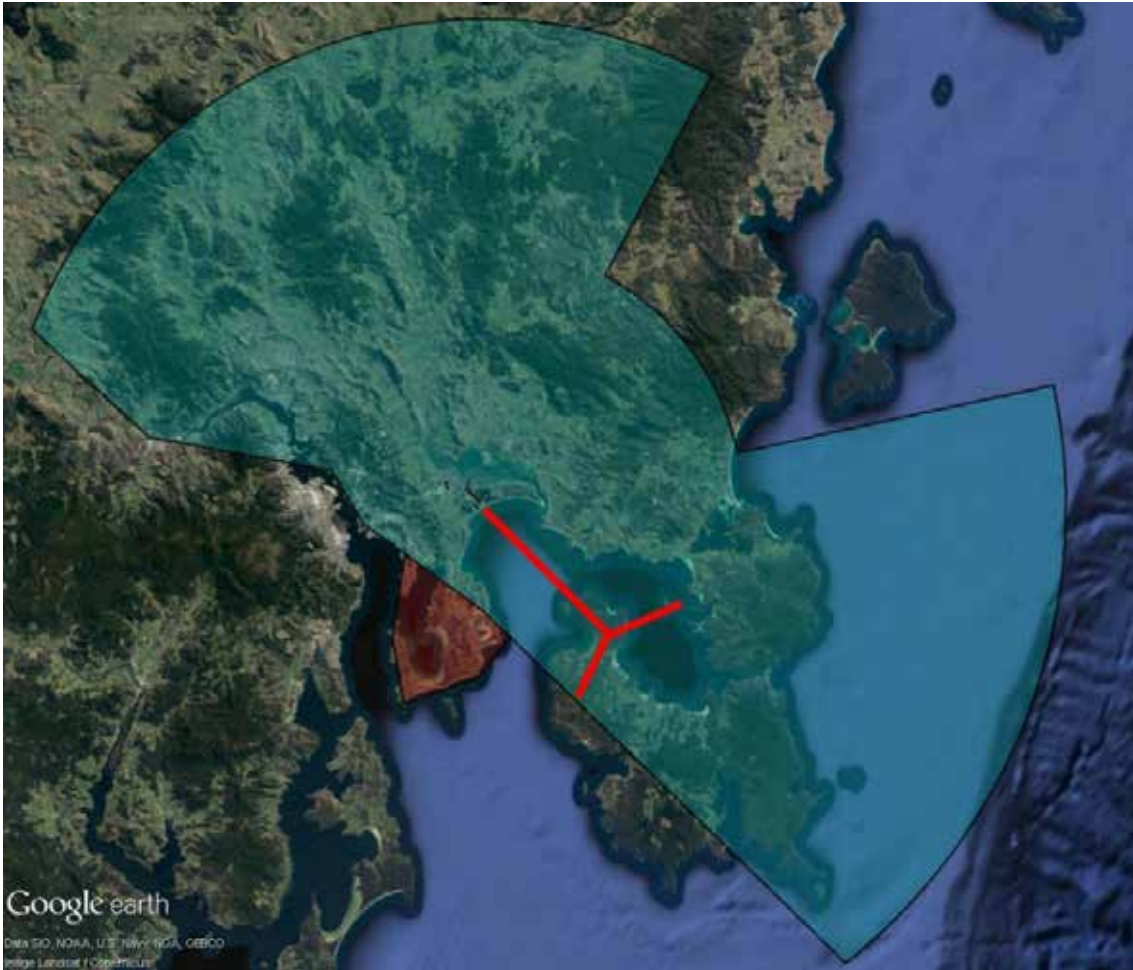


Figure 9 – Controlled airspace shown in green. Designated training area depicted in brown.

CASA designates airspace categories. Airservices would be required to submit a proposal to CASA to change the airspace category to accommodate these flight paths. This airspace change process would take at least a year. The approval decision sits with CASA.

A detailed environmental assessment would need to be conducted to assess the effect on communities and the environment. If the environmental assessment found that there would be a significant impact on the community, Airservices would not progress the alternative. If the environmental assessment indicated the change could potentially be implemented, CASA approval would be pursued and community consultation undertaken.

If Alternative 3 proceeded, but Alternative 4 did not, or vice versa, aircraft coming from the ports that the alternative was catering for would continue to require the use of either Alternative 1 or Alternative 2.

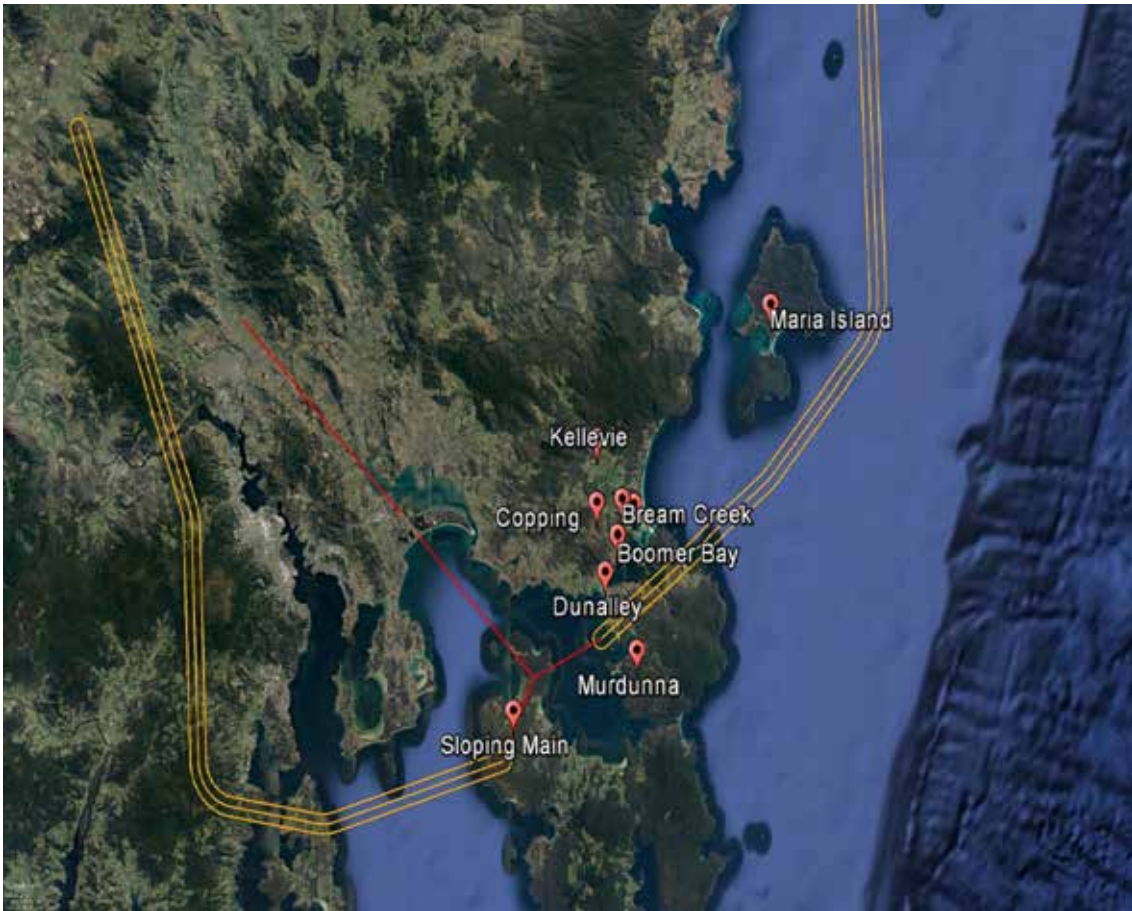


Figure 10 - Alternatives 3 (flight path from the east) and 4 (flight path from the west)

In Alternative 3 aircraft would fly around 2.5 kilometres north of the north-western edge of Murdunna, which would be noticeable to the community in the area. Noise levels are estimated to be below 60 decibels, but due to the low ambient noise, this is likely to have similar effects to those currently experienced by communities affected by the current flight path (Alternative 1).

All areas overflown by Alternative 4 would be newly overflown. This would affect a number of small townships and key tourist areas such as Kettering, Oyster Cove, Snug and Bruny Island by overflight at relatively high levels of around 9000 feet. However due to the low ambient noise in these areas this may be noticeable. Sloping Main would experience an increased concentration on the western “arm” of the existing RNAV approach.

As discussed above, if only one of Alternative 3 or 4 was implemented, some aircraft would still need to use either Alternative 1 or 2 instead depending on which airport they originate from.

5. COMMUNITY FEEDBACK

In total, 92 residents have contacted the Noise Complaints and Information Service (NCIS) since the flight path was introduced with complaints and/or feedback about the alternatives proposed.

Complaints and submissions were received from residents of Kellevie, Dunalley, Copping, Boomer Bay, Marion Bay, Bream Creek, Murdunna, Sloping Main, Eaglehawk Neck, Forcett and Dodges Ferry.

From the commencement of the changes on 14 September 2017, up to the community consultation session held in Dunalley on 11 November 2017, complaints were received from 45 people with positive feedback provided by two people. Some residents contacted the NCIS more than once.

After the community consultation session on 11 November, written feedback was received from 71 people, some of whom made more than one submission and 26 of whom had also initially lodged complaints.

Section 5.1 identifies the key issues from the feedback and section 5.2 discusses the community's feedback on the alternatives proposed.

5.1 Issues

The main issues raised included:

- The effects of the new flight path, particularly given the quiet nature of the area
- Concern or confusion surrounding the reasons for change and the location of the flight path
- The inadequacy of the consultation process
- The flight path review process

Most respondents raised more than one of these issues.

5.1.1 Effects of Flight Path

Fifty-three residents described the effects the new flight path was having on their families and businesses. Airservices acknowledges that the effect this flight path would have on a quiet rural area where there is very little ambient noise was underestimated. The community's feedback to this effect will assist Airservices in its evaluation of the noise impacts of flight paths in non-urban areas in the future.

5.1.2 Reasons for Change

Concerns were raised about the location of the flight path and the reasons for the change.

The reasons that led to the flight path changes on 14 September are described in section 3. Additional detail describing the safety and other benefits of standard arrival routes is outlined below.

As explained at 2.3, before the STAR was introduced there was no flight path that moved aircraft from the point at which they entered Terminal airspace (see Figure 9) to where they intercepted the RNAV approach. In aviation, 'flight paths' usually mean standardised, published routes that all aircraft follow.

Standardised flight paths have separation standards designed into them. Each aircraft flies exactly the same route and are subject to the same altitude requirements. Air traffic controllers still need to ensure that the requisite separation standard between each aircraft flying the flight path and any adjacent flight path is maintained and that an orderly landing sequence is established, but lateral segregation is built into the system. Where each aircraft is - at any given time - is predictable, which enhances both safety and efficiency.

On standardised routes, aircraft follow a connected, vertical path all the way to the ground and have the benefits of vertical guidance using on-board technology. This reduces the risk of controlled flight into mountains, obstacles or the ground, and this therefore also increases safety.

Air traffic management efficiency is also a consideration. Standard routes allow air traffic control to provide a control service to more aircraft in the same airspace at the same time. As demand for air travel to and from Hobart increases, this becomes more and more important.

When flight paths are standard, aircraft fly a more efficient, predictable and stable descent profile. This uses reduced power because the flight management system can calculate throttle settings and a consistent angle to fly based on the number of track miles there are to the runway from any given point. Aircraft are also not being directed to slow down and speed up for separation purposes as frequently. This decreases both fuel burn and noise.

A number of respondents felt that, in the absence of evidence that the previous system was unsafe, there was no basis for the argument that the change enhances safety. Airservices primary responsibility is the safety of air traffic management, and improvements to procedures and systems that enhance safety are continuously identified, tested and implemented. Circumstances change over time and factors such as increased growth in traffic mean increased risk. Airservices must take this into account and plan for the future as well as the present.

Some residents rejected the safety argument based on their observations that some aircraft do not follow the STAR. Figure 11 shows all regular public transport aircraft between 14 September and 13 October 2017. The yellow lines show the current STAR:

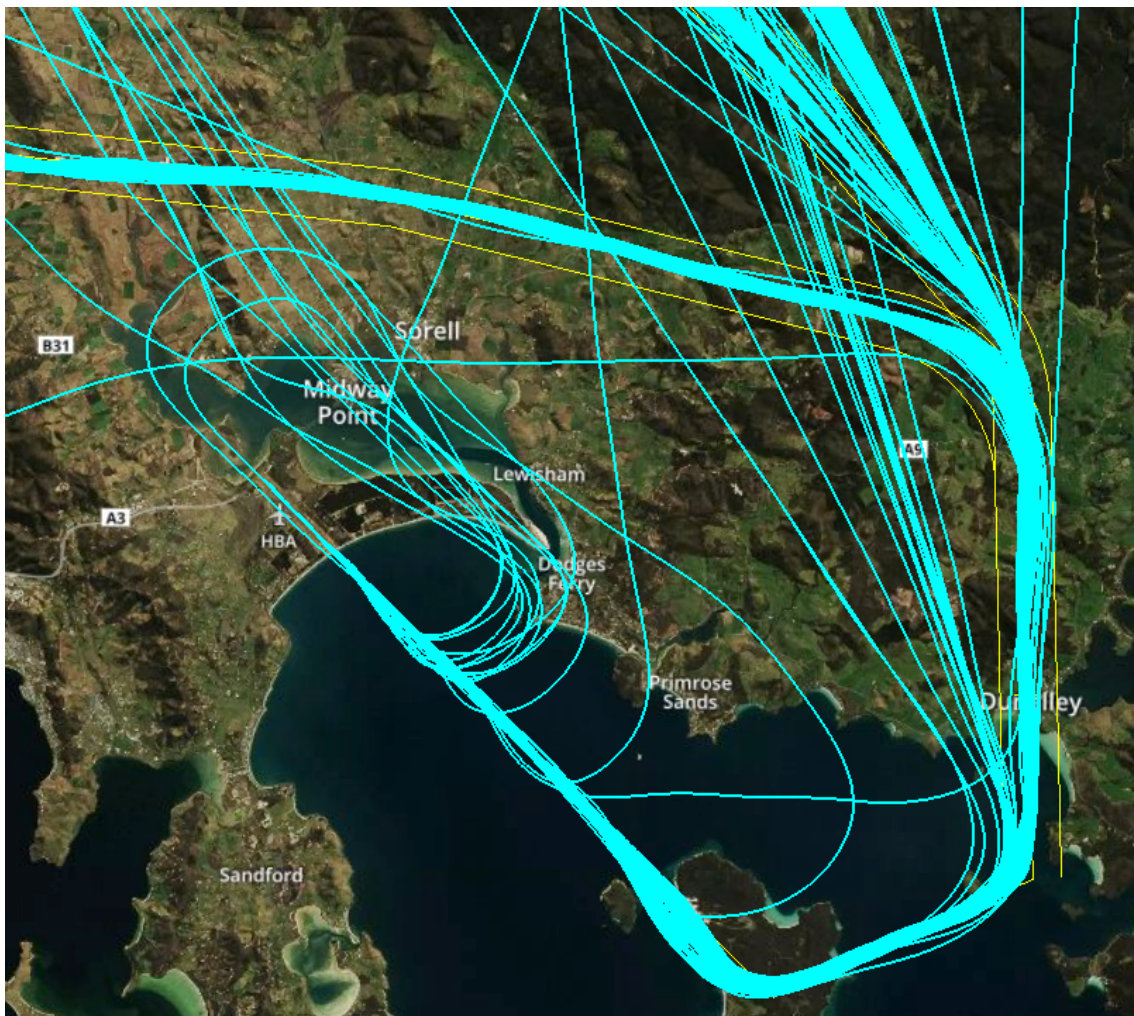


Figure 11 - STAR and off-STAR tracking 14 September - 13 October 2017

While the majority of aircraft follow the STAR, in Figure 11 a number can be seen that are flying off the STAR. This is not unusual. There are a number of reasons why aircraft may be directed “off-STAR” by air traffic control. The most common reason is for traffic management. While STARs do enhance safety through increased predictability and consistency, from time-to-time unforeseen circumstances arise. For example, there may be light aircraft to manage that are not able to use SIDs and STARs, a faster aircraft may be catching up with a slower one in front or an emergency medical flight may need priority or an emergency services operation may need to be avoided. Air traffic controllers have to manage this tactically in response to the circumstances.

Another key reason why jet aircraft may fly outside published routes, is to enable them to avoid bad weather including storm cells and dangerous cloud formations that cannot be flown through. Modern aircraft have sophisticated weather radars on board that allow pilots to identify bad weather that may be many nautical miles away from airports and not evident to those on the ground. If a pilot requests a diversion due to weather, air traffic control is required to provide this.

Some residents were concerned that the reason for the change has been explained variously by reference to factors such as enhanced safety, air traffic management efficiency, minimisation of delays and CASA's mandate about satellite navigation. All these factors were relevant in coming to the decision that the change was required. Aviation is a complex industry and multiple factors need to be taken into account in every decision – safety, efficiency for air traffic management in the air and on the ground, providing more predictability to assist with the workload for pilots and air traffic control, aircraft performance and engineering, the availability of navigation aids, CASA requirements, international standards, the economic importance of the industry and many other factors must be considered.

5.1.3 Consultation Process

The manner in which consultation on the flight path change was conducted through the Community Aviation Consultation Group (CACG⁹) was raised as a key issue by 45 people. No-one who contacted the NCIS was aware of the change before it occurred.

Airports around the country have established CACGs as a key consultation forum for community representatives to come together with airports and relevant federal and state government agencies to discuss a range of airport-related issues, including proposed airport construction and flight path changes. CACGs are therefore the primary community forum Airservices utilises when proposing flight path changes. Airservices recognises that these groups do not always contain representatives from every affected area and Airservices acknowledges that consultation in this instance was not adequate to ensure that community members were aware of the proposed change.

After the flight path review and the community consultation session in November was announced, concerns were raised about the ensuing process and/or timeline by 10 residents. The objective of the consultation session was to explain the constraints that existed and what solutions could be offered so that the community could then provide informed feedback in writing about their preferred alternative. Airservices approach to the consultation session was to offer small groups an introduction followed by the opportunity to ask subject matter experts specific questions about the alternative flight paths that had been identified. This approach allowed many people to personally express their views, ask questions and explore alternatives, something that could not have been achieved in a larger forum-style meeting.

Airservices acknowledges that the ten day timeframe for feedback on the proposed alternatives was short. Initial community complaints on the flight path change suggested that the community sought a quick resolution to their concerns. The timeline for consultation on the proposed alternatives was set to expedite a change if that was what the community feedback indicated. Once Airservices flight path review had identified some alternatives, putting these before the community at the earliest opportunity was considered to be the appropriate and responsive course of action.

Any change would take at least three months to introduce due to the requirement to publish the procedure in aeronautical documents 56 days before it is implemented – this gives the airlines time to program it into their flight management systems and for any flight crew and air traffic control training to be conducted. Publication dates for aeronautical documents are standard throughout the world as set out by the International Civil Aviation Organization Aeronautical Information Regulation and Control (AIRAC) cycle of every 28 days.

Airservices procedures require any flight path change to be consulted through the relevant Community Aviation Consultation Group. In this case, the Hobart Community Aviation Consultation Group (CACG) was 22 November 2017. Airservices aimed to present any proposed change at the November meeting so that it could be implemented in March 2018. The next meeting is scheduled in March 2018, which would have delayed implementation until the second half of 2018.

9. Information about CACGs can be accessed from the Department of Infrastructure and Regional Development's website at <https://infrastructure.gov.au/aviation/airport/planning/index.aspx>

Concerns about the session pre-empting the results of the Aircraft Noise Ombudsman (ANO) were raised. The ANO Charter enables the ANO to review actions taken by Airservices and make recommendations to the Airservices Board. However the ANO has no powers to require flight path changes to be made or other actions to be taken. It is up to Airservices to make flight path changes, thus waiting for the ANO report would unnecessarily delay improvement action being taken. Any recommendations made by the ANO's review about consultation processes will be taken into account in consulting about flight path changes in future.

A considerable proportion of the written feedback received from the community about the proposed alternatives expresses the view that a longer consultation process is required and suggests that finding the best solution for the whole community is valued more highly than a fast solution.

5.1.4 Other Issues

Several respondents suggested that aircraft should be higher than at present. Arrival flight paths are designed to allow a standard glide slope of three degrees, descending by approximately 300 feet per nautical mile. At this rate 30 nautical miles are required for an aircraft to descend from 9000 feet (the altitude they are at when crossing over the departing traffic) to the runway. This means that aircraft cannot be substantially higher than their current altitudes on this flight path.

Some residents were concerned that no environmental assessment had been done.

Airservices has environmental obligations under both the *Air Services Act 1995* and the federal *Environmental Protection and Biodiversity Conservation (EPBC) Act 1999*. Airservices has an environmental management system that is independently certified to the relevant international standard (ISO 14001) and which requires environmental assessments to be conducted. The environmental assessment of the introduction of SIDs and STARs to Hobart is available from the Airservices website.¹⁰

Gaining an understanding of the different powers and responsibilities of the agencies involved in aviation can be challenging, and this was evident in some of the feedback received. For example, concerns were raised that the consultation process breached the *Airports Act 1996*¹¹ and the Hobart Airport *Master Plan*¹². The Airports Act establishes a system for regulating airports. The Master Plan is the Airport's document and is produced to meet its obligations under the Airports Act. In contrast, Airservices is governed by separate legislation, the *Air Services Act 1995*¹³. Flight paths in controlled airspace are the responsibility of Airservices, not the Airport. Section 10 of the Air Services Act provides that, in the performance of its functions, Airservices must, where appropriate, consult with government, commercial, industrial, consumer and other relevant bodies and organisations. The Civil Aviation Safety Authority (CASA) is Australia's aviation safety regulator and sets down rules that Airservices must follow in the provision of air traffic management. CASA also designates airspace categories including controlled and uncontrolled airspace.

Another resident challenged Airservices for not being aware of the specifics of future increases in international traffic to and from Hobart Airport. Airservices regularly reviews forecast traffic levels at airports to manage operational risk. Specific details about new airlines intending to fly to particular airports may be commercial in confidence between the airport and the airline.

10. <http://www.airservicesaustralia.com/projects/flight-path-changes/hobart-airport-standard-arrivals-and-departures/>

11. <https://www.legislation.gov.au/Details/C2016C00709>

12. https://hobartairport.com.au/wp-content/uploads/2017/02/HIA_MasterPlan_FINAL_030316__compressed__smaller.pdf

13. <https://www.legislation.gov.au/Details/C2012C00170>

5.2 Feedback on the Alternative Proposals

5.2.1 Revert to the old flight path / start again

Feedback from 35 residents urged that the flight path revert to its previous location and/or start the design process again. Most linked this to the consultation process. Some respondents advocating reversion rejected all other proposed alternatives, while others also nominated one of the other alternatives as a second-best option.

Unfortunately, reverting to the previous flight path is not an alternative that Airservices can offer. This is because:

- The introduction of a standard arrival route is a significant safety enhancement for aircraft and passengers traveling into Hobart Airport. These safety benefits are described in section 3 and 5.1.2. Airservices must always ensure that the safety of air navigation is its most important consideration
- The VOR used for arrival flight paths in place prior to 14 September has been decommissioned, and when it is relocated and recommissioned it will be available only as a back up to the satellite based navigation at Hobart airport.

5.2.2 Alternative 1

Two residents of Dodges Ferry submitted positive comments about the current STAR to Runway 30. Prior to the change arriving aircraft flew over Dodges Ferry when making visual approaches. This overflight occurred shortly before the aircraft turned onto the runway-aligned segment of the short approach, and due to being only minutes away from touching down, these aircraft were at low levels.

5.2.3 Alternative 2

Twelve residents supported the implementation of Alternative 2. Some of these cited it a second preference to reverting to the old flight paths. Others suggested using Alternative 2 as a temporary measure.

A further three residents suggested that Alternative 2 be moved further west to be on the other side of the ridge line from Kellevie at one end, and further away from Dunalley at the other. A number of attendees at the consultation session also supported this view.

Two residents expressed concerns about how they would be affected by Alternative 2.

5.2.4 Alternatives 3 and 4

Fourteen residents supported the long-term option of Alternative 3 however generally acknowledged its potential negative effects on Murdunna and suggested it be moved further south. There was little written comment received on Alternative 4 but the prevailing view expressed at the community session was that it was an unrealistic option given the area is not currently overflowed. The written feedback indicated that residents understood that the viability of these options is not a guaranteed and is contingent on the required airspace change being ultimately approved.

5.2.5 Share the Noise

Residents sought solutions that would mitigate the effect of the concentration of traffic which results from standardisation of routes.

Airservices acknowledges these views however providing a sharing solution is complex. Alternatives 3 and 4 would be manageable because they flow logically from the current route structure which has Melbourne and Adelaide traffic arriving from the west while Sydney and Brisbane traffic arrive from the east. Each approach would utilise a different part of the available airspace. However, having more than one STAR sharing the same piece of airspace is not done anywhere in Australia where STARS are in use.

There is usually only one STAR to each runway for all traffic. This is because having multiple STARs to one runway will increase complexity for pilots and air traffic control, potentially reducing the safety benefits of having a STAR. The safety benefit is that each aircraft is given the same route and the position and altitude of each aircraft flying that route is entirely consistent and predictable. This reduces the workload for pilots and air traffic controllers and reduces the possibility of human error.

5.3 Other Suggestions

Respondents suggested changes to the proposed alternatives such as:

- Moving Alternative 2 further west
- Shortening the RNAV approach
- A southwards extension of the current STAR or of Alternative 2 to increase altitudes over the affected areas with banking occurring over Norfolk Bay
- Southwards extension of Alternative 4
- Southwards extension of Alternative 3
- Fly across the coast to the north of affected communities, over the Weilangta Forest, and then around/over the Tasman Peninsula

Airservices acknowledges the views of residents who asked that Alternative 2 be moved further west. However, initial analysis indicates that this would negatively affect additional residences. Given that the community places a high value on comprehensive consultation, Airservices is cognisant that this proposed adjustment has not been put to that community and for this reason will not pursue it outside the further review (see 6).

The other suggestions will require further detailed analysis, environmental impact assessment and community consultation and will be considered as part of Airservices further review of the SIDs and STARs at Hobart (see Section 6).

Airservices thanks residents for their consideration and the time taken by to participate in the consultation process.

6. CONCLUSION

The view put most frequently in the community feedback was that the flight path should revert to the pre-14 September structure and the design process should start again. As discussed at 5.2.1, Airservices is unable to offer this solution.

There was no consensus on the flight path alternatives. Of those respondents who did nominate a preference, Alternative 2 was generally preferred in conjunction with a longer term review.

Based on the feedback received and noting the constraints that exist, Airservices will implement Alternative 2 as soon as possible. This will see aircraft move further away and provide an improved noise outcome for some existing affected areas starting from Kellevie in the north to Dunalley in the south. The alternative flight path is now as closely aligned to the original flight path as possible while still achieving the safety outcome.

This implementation is planned to be completed in March 2018 due to the requirement to publish the procedure in aeronautical documentation and provide airlines with sufficient time to program it into their flight management systems.

In response to community feedback for a longer consultation process, Airservices will also undertake a further review of the Hobart STARs and SIDs. A terms of reference will be published by the end of January 2018. Airservices will be consulting closely with the community and other stakeholders throughout the review process, which is expected to take approximately twelve to eighteen months to complete.

APPENDIX 1: HANDOUT PROVIDED TO THE COMMUNITY

HOBART AIRPORT REVIEW OF ARRIVAL FLIGHT PATH

Airservices introduced changes to arrival and departure routes at Hobart Airport on 14 September 2017. The changes organise aircraft arriving into or departing from Hobart Airport onto standard routes.

Airservices has carefully considered the concerns raised in community feedback about the changes to this flight path and has conducted a flight path review to identify and assess possible safe and feasible alternatives.

In assessing possible alternatives safety was the highest priority while seeking every opportunity to minimise and where possible reduce the impact of aircraft noise.

THE REVIEW PROCESS

A final decision will be made by Airservices based on safety, air traffic management efficiency and community feedback received. The outcome and reasons for the decision will be published in a Review Report on 22 November 2017. The Report will set out the alternatives considered and the reasons why each was determined to be feasible or not feasible. It will also contain a summary of the issues raised in the community feedback and complaints.

Feedback will be accepted until midnight 19 November 2017. Everyone who submits feedback will be notified of the outcome in writing on 22 November 2017.

CONSTRAINTS ON FLIGHT PATH DESIGN

In considering alternatives for the flight path, the following constraints exist:

- A Standard Terminal Arrival Route (STAR) enhances safety by building in the required separation distances between aircraft, and by ensuring consistency and predictability of arrival movements

- The flight path must be designed to international safety standards that have been adopted for Australia by the airspace regulator, the Civil Aviation Safety Authority
- There must be an arrival flight path to the southern end of the runway that caters for aircraft coming from both the east and west coasts of Australia
- This flight path must join up to the pre-existing area navigation (“RNAV”) instrument approach path which provides guidance to the runway in all weather conditions– the RNAV flight path is illustrated in red in figures 1 and 2 below
- The turn onto the RNAV flight path must be between 70 and 90 degrees to meet aircraft performance and safety requirements
- The arrival flight path must cross over the departure flight path at a location that allows aircraft to safely descend and climb on their respective flight paths
- The flight path must remain inside “controlled airspace”
- Controlled airspace is designated by the Civil Aviation Safety Authority. The eastern edge of Tasmania and the ocean further to the east is largely uncontrolled airspace which prevents flight paths being located there
- Wherever practicable aircraft should not fly over communities not currently overflown

ALTERNATIVES CONSIDERED

Alternative 1: Current flight path

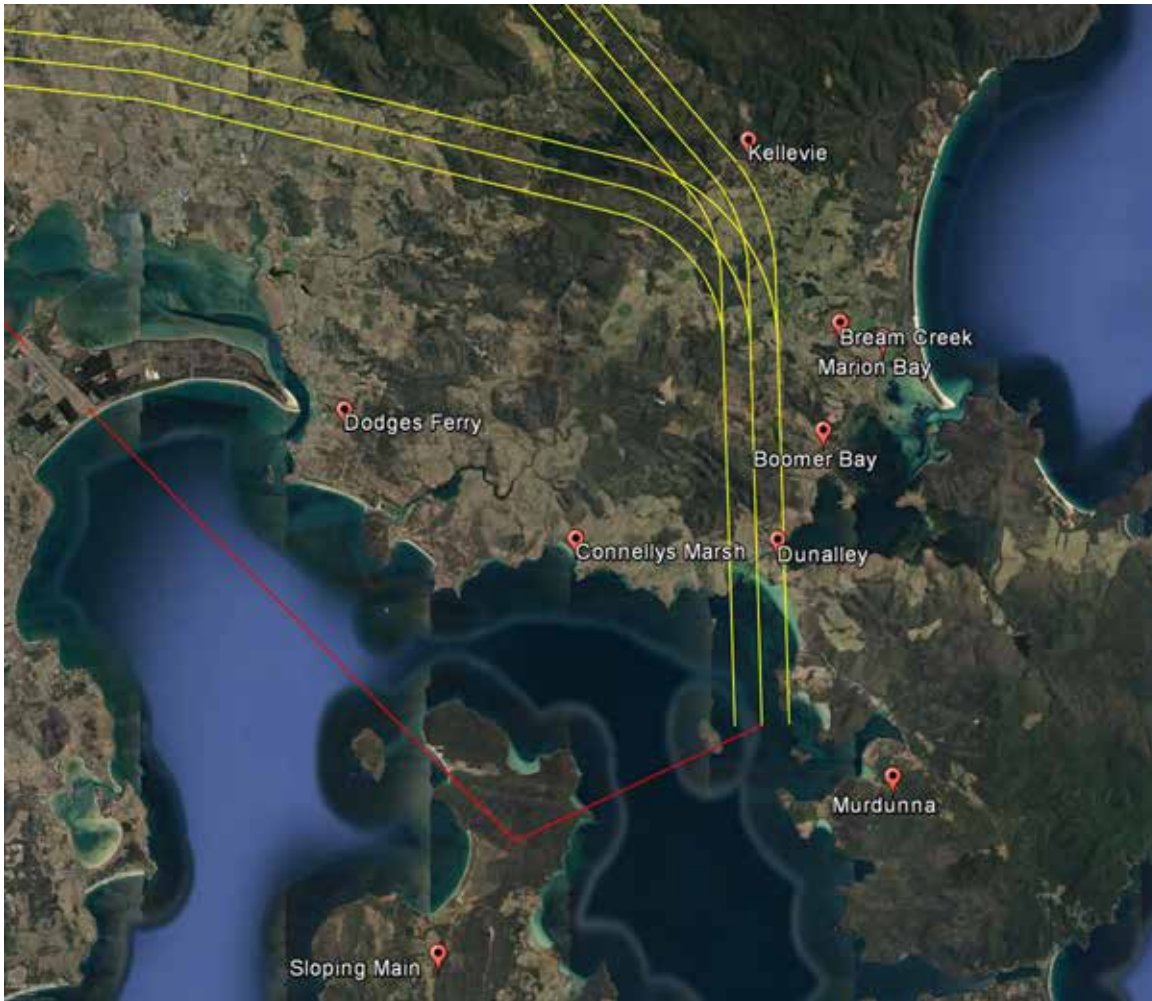


Figure 1: Alternative 1 – the current flight path, implemented on 14 September 2017, is shown in yellow. The red flight path is a pre-existing flight path that has not changed.

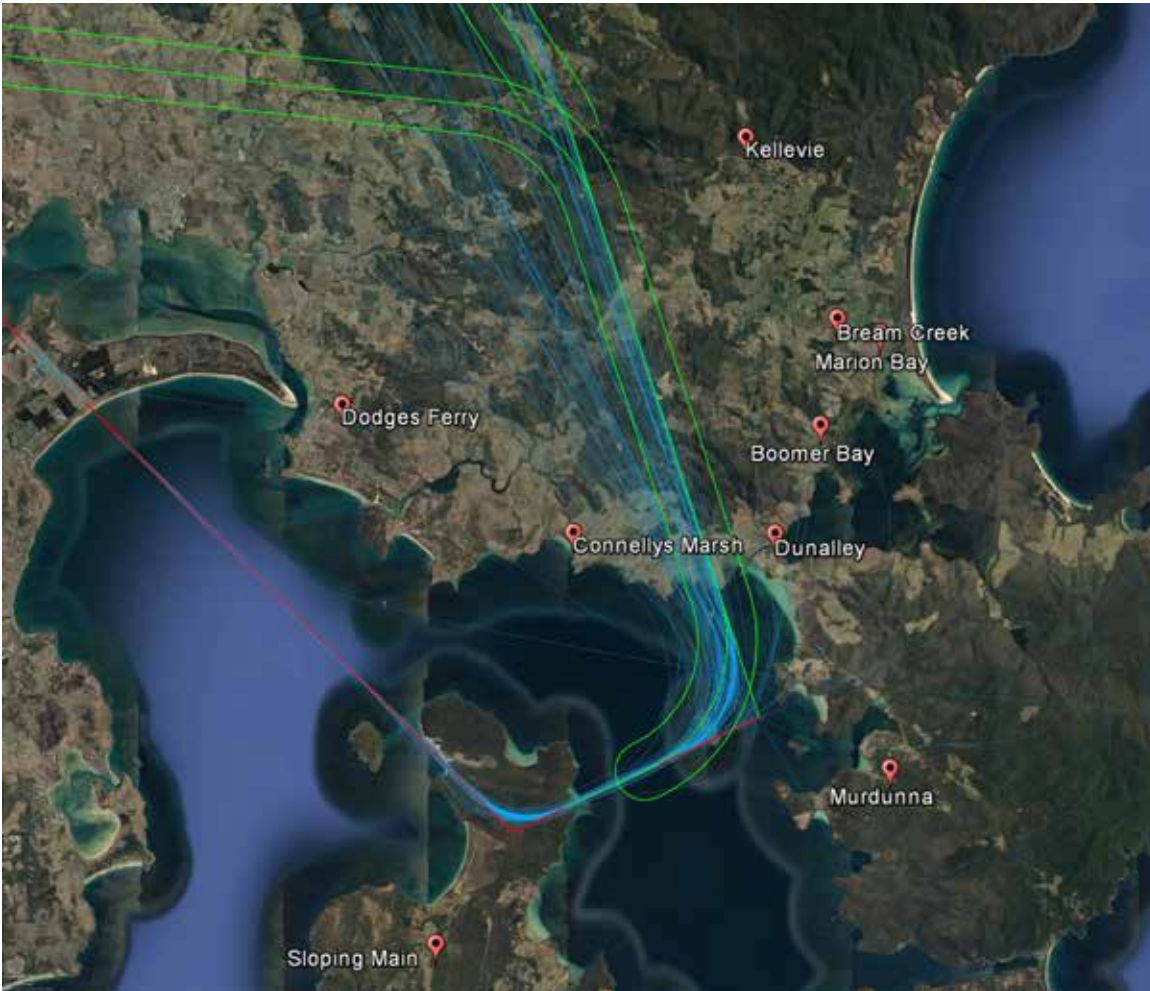


Figure 3: Comparison of Alternative 2 with flight tracks pre 14 September 2017. The blue tracks are actual aircraft tracks before the change was made on 14 September 2017. Alternative 2 is shown in green.

Alternatives 3 and 4

Alternative 3 would be used by aircraft coming from north eastern ports such as Sydney and Brisbane. Alternative 4 would be used by aircraft coming from southern and western ports such as Melbourne, Adelaide and Perth.

Alternatives 3 and 4 would require airspace redesign. Flight paths for large commercial passenger aircraft must be in “controlled airspace”. These alternatives are outside controlled airspace. The Civil Aviation Safety Authority (CASA) designates airspace categories. Airservices would need to submit a proposal to CASA to change the airspace category to accommodate these flight paths. This airspace change process would take at least a year, with no guarantee that CASA will approve the proposal.

Detailed environmental assessment will need to be conducted to assess the effect on communities and the environment. If the environmental assessment found that there would be a significant impact on the community, Airservices would not progress the alternative. If the environmental assessment indicates the change potentially could be implemented CASA approval would be pursued and community consultation undertaken.

If Alternative 3 proceeded but Alternative 4 did not, or vice versa, aircraft coming from the ports that the alternative was catering for would continue to require the use of either Alternative 1 or Alternative 2.

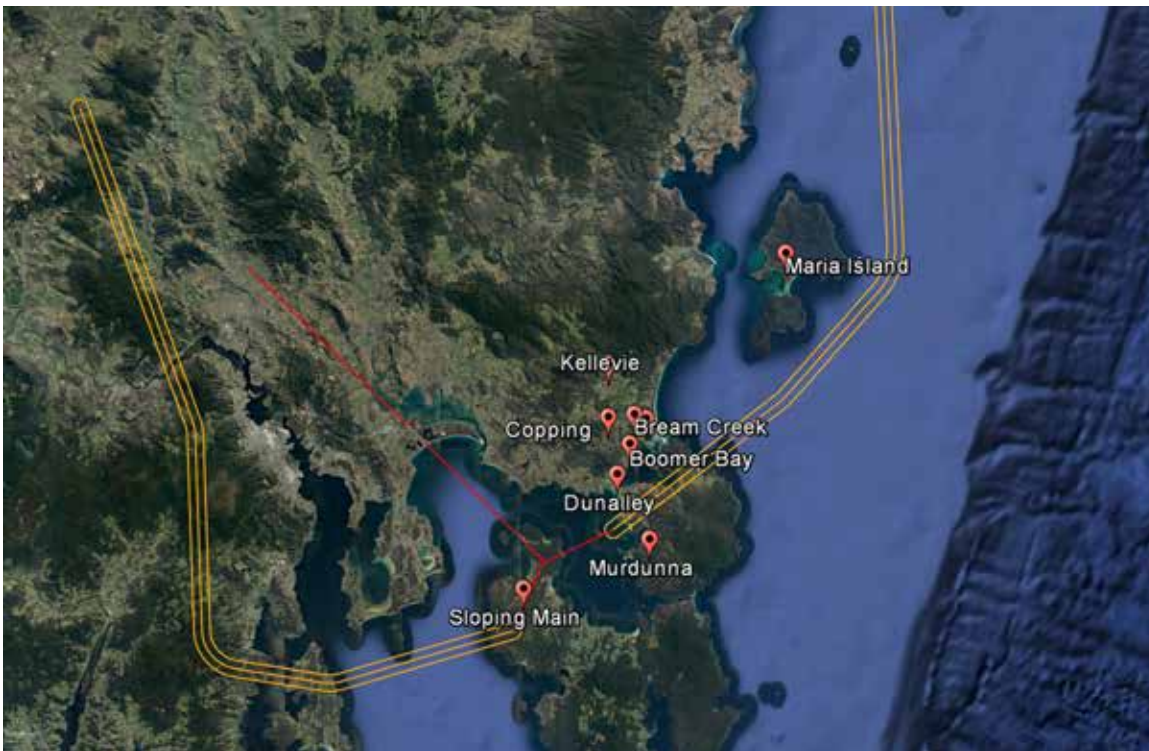


Figure 4: Alternatives 3 (flight path from the east) and 4 (flight path from the west)

COMPARISON OF ALTERNATIVES

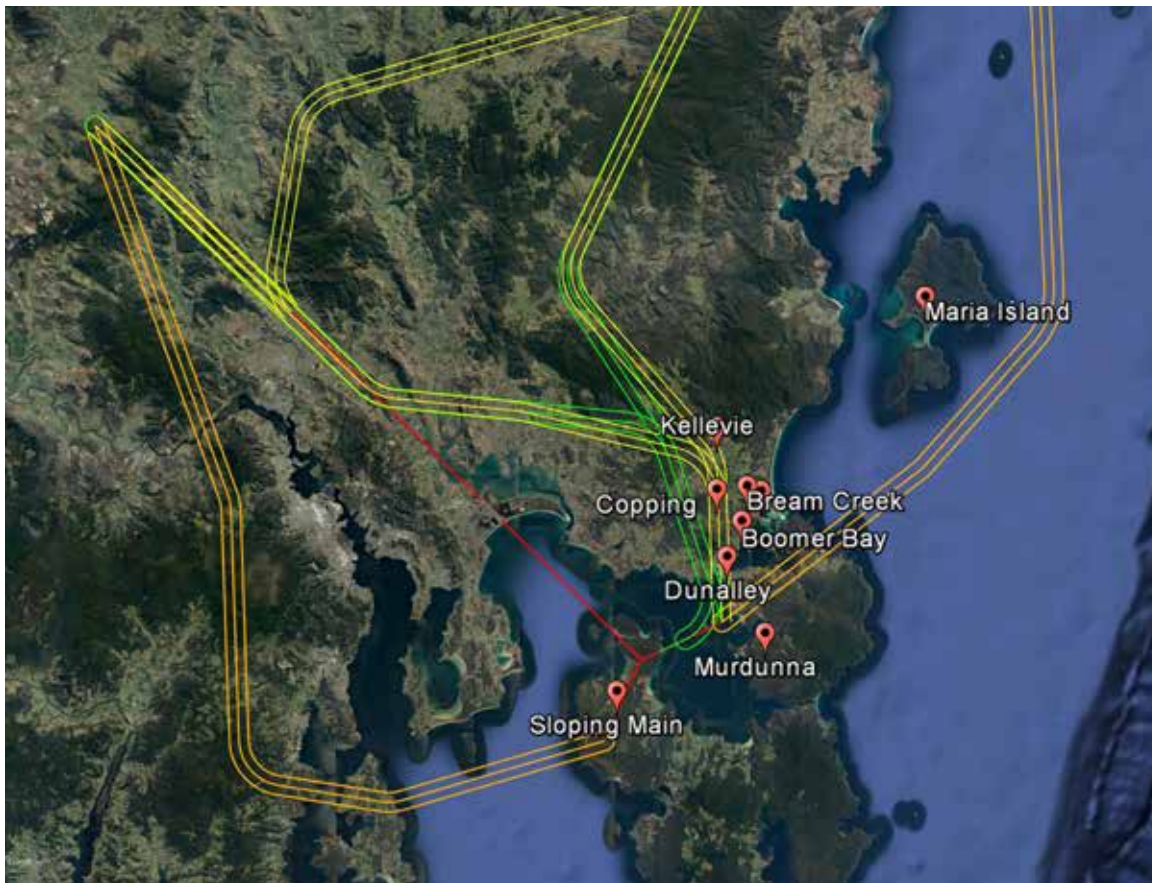


Figure 5: Comparison of all alternatives: 1 (yellow), 2 (green), 3 and 4 (orange). The pre-existing, unchanged RNAV flight path is also shown (red)

The noise impacts of the current flight path (Alternative 1) and the effects of the concentration of aircraft into one consistent flight path have been reported in Dunalley, Copping, Kellevie, Bream Creek, Marion Bay, Boomer Bay, Murdunna and Sloping Main. Dunalley, Copping and parts of Kellevie are directly overflown.

Alternative 2 replicates, as far as is possible, the “long approach” that was previously flown. This proposal would move aircraft further away from affected areas starting from Kellevie in the north to Dunalley in the south. While communities such as Dunalley, Copping

and Kellevie will no longer be overflown, aircraft are likely to continue to be heard, especially at the southern end of the flight path. Dunalley residents will notice aircraft tracking on average 1 kilometre west of the current flight path and around 1.5 kilometres west of the south-western edge of the township.

Residents of Connelys Marsh may notice arriving aircraft tracking closer than before at between 3 to 4 kilometres from the eastern edge of the township. The current arrival flight path is between 4 and 5 kilometres from the eastern edge.

Residents of Murdunna and Sloping Main would notice little improvement from Alternative 2 compared to the current flight path (Alternative 1). While not overflowed, these areas will continue to notice the effect of the concentration of all arrivals into the one flight path.

In Alternative 3 aircraft would fly around 2.5 kilometres north of the north-western edge of Murdunna which would be noticeable to the community in the area. Noise levels are estimated to be below 60 decibels but due to the low ambient noise this is likely to have similar effects to those currently experienced by communities affected by the current flight path (Alternative 1).

All areas overflowed by Alternative 4 would be newly overflowed. This would affect a number of small townships and key tourist areas such as Kettering, Oyster Cove, Snug and Bruny Island by overflight at relatively high levels of around 9000 feet. However due to the low ambient noise in these areas this may be noticeable. Sloping Main would be adversely affected by increased concentration on the western "arm" of the existing RNAV approach.

As discussed above, if only one of Alternative 3 or 4 was implemented, aircraft that would have used the other alternative would need to use either Alternative 1 or 2 instead.

TIMEFRAMES

The earliest Alternative 2 could be implemented is March 2018. Any flight path change takes at least three months to implement. The detailed design of the approach is required to be undertaken and the new flight path must be published a minimum of 56 days before it is implemented. This gives the airlines time to program it into their flight management systems and conduct any required training.

Alternative 2 would require only the standard publication period and could therefore be implemented in around three months.

Alternatives 3 and 4 would require a minimum time of 18 months to achieve, including three months for detailed environmental assessment, approximately twelve months for community engagement and airspace change, and, if it proceeds, the required three months for implementation.

HOW CAN I LODGE MY FEEDBACK?

Feedback will be accepted until midnight on 19 November 2017.

An online Hobart Flight Path Feedback Form is available at: <https://complaints.bksv.com/feedback>

The Feedback Form can also be lodged at the Community Consultation Drop-In Session or posted to NCIS, Post Box 211, Mascot NSW 1460.

MORE INFORMATION

Interactive flight path maps of Alternatives 1 and 2 and more information can be accessed from this webpage:

<http://www.airservicesaustralia.com/projects/flight-path-changes/hobart-airport-standard-arrivals-and-departures/>

