

# **Sunshine Coast Airspace and Flight Path Changes**

## **Proposed Final Design and Consideration of Feedback**

**July 2019**



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*While the information contained in this document has been presented with all due care, Airservices does not represent that the information is free from errors or omission.*

## Purpose

The purpose of this document is to provide a summary of the Sunshine Coast Airspace and Flight Path Changes, present the proposed final design, describe how community feedback has been considered, and used to shape these designs.

We will present the constraints, considerations and criteria used to design the proposed flight paths, and the decision making processes used to develop the proposed final flight paths. We will also present the implementation strategy and next steps.

Further information regarding how aircraft will operate on the flight paths and in the airspace, the potential impacts and benefits of the change, and the associated effect of future aircraft operations (including noise, visual impacts and emissions), will be provided through community specific fact sheets and through the release of the revised Targeted Environmental Impact Assessment (TEIA version 2) on our website.



**Figure 1 Sunshine Coast Airport Expansion Project (SCAEP)** *Source: Sunshine Coast Council Website*

# Section 1 Proposed Final Design

## Background

Sunshine Coast Council (SCC) is leading the Sunshine Coast Airport Expansion Project (SCAEP) that will see the creation of a new runway at Sunshine Coast Airport (SCA) known as Runway 13/31.

In July 2012, as part of the development of the Environmental Impact Statement (EIS), Airservices and other stakeholders were approached by SCC to assess the safety and operational feasibility of airspace and flight path designs that could support the new runway. Airservices reviewed these designs and provided in principle agreement for the concept designs that were defined in the EIS.

In 2016 the SCAEP was approved by State and Federal governments, following SCC's submission of the EIS, which included concept flight paths that would support the operation of the new runway.

In 2018, SCC provide Airservices with the proposed final critical design elements associated with the new runway and requested that Airservices design flight paths modelled on the flight path design concepts in the approved EIS.

In 2019, Airservices identified that there were opportunities, in certain communities, to improve environmental outcomes particularly associated with residential overflight. Therefore, Airservices proposed some variations to the concept flight paths that had been approved in the EIS, and sought community feedback on these proposed variations.

We completed a Targeted Environmental Impact Assessment (TEIA), an internal environmental assessment of the proposed flight path designs, and the findings were consistent with the findings of the EIS.

We initiated a range of targeted consultation activities between 20 March and 30 April 2019, and, as a result of community interest in this project, expanded this to include general consultation across the Sunshine Coast region:

- The targeted sessions were designed to seek feedback from the specific communities where the proposed flight paths varied from the concept flight path corridors in the approved EIS, with the aim of reducing overflight of these communities. These were referred to as the 'Consultation Areas'.
- The general consultation included areas where the proposed flight paths were consistent with the concept flight path corridors in the approved EIS. These were referred to as the 'General Areas'.

During the consultation period, we received a range of feedback from a broad cross section of communities in the Sunshine Coast region.

We collated and analysed all feedback from community members in both the targeted consultation areas and the general consultation areas.

We considered the analysed feedback, including reviewing submissions that presented alternative flight path proposals, to identify if the proposed flight path designs could be improved across a range of safety, operations, environmental and/or community impact considerations.

The outcome of this consideration is the proposed final design.

## Timeline

A timeline that presents the various design, development and/or approval processes for the SCAEP and the Sunshine Coast Airspace Change Project is located on the Airservices website.

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### [Timeline – Sunshine Coast Airport Expansion Project](#)

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## Proposed Final Design

Following consideration of all feedback, we have developed the proposed final design.

Where we have been able to shape the proposed final design to reflect community feedback, we have incorporated amendments to either the location of the flight paths and/or our air traffic management procedures, including noise abatement procedures.

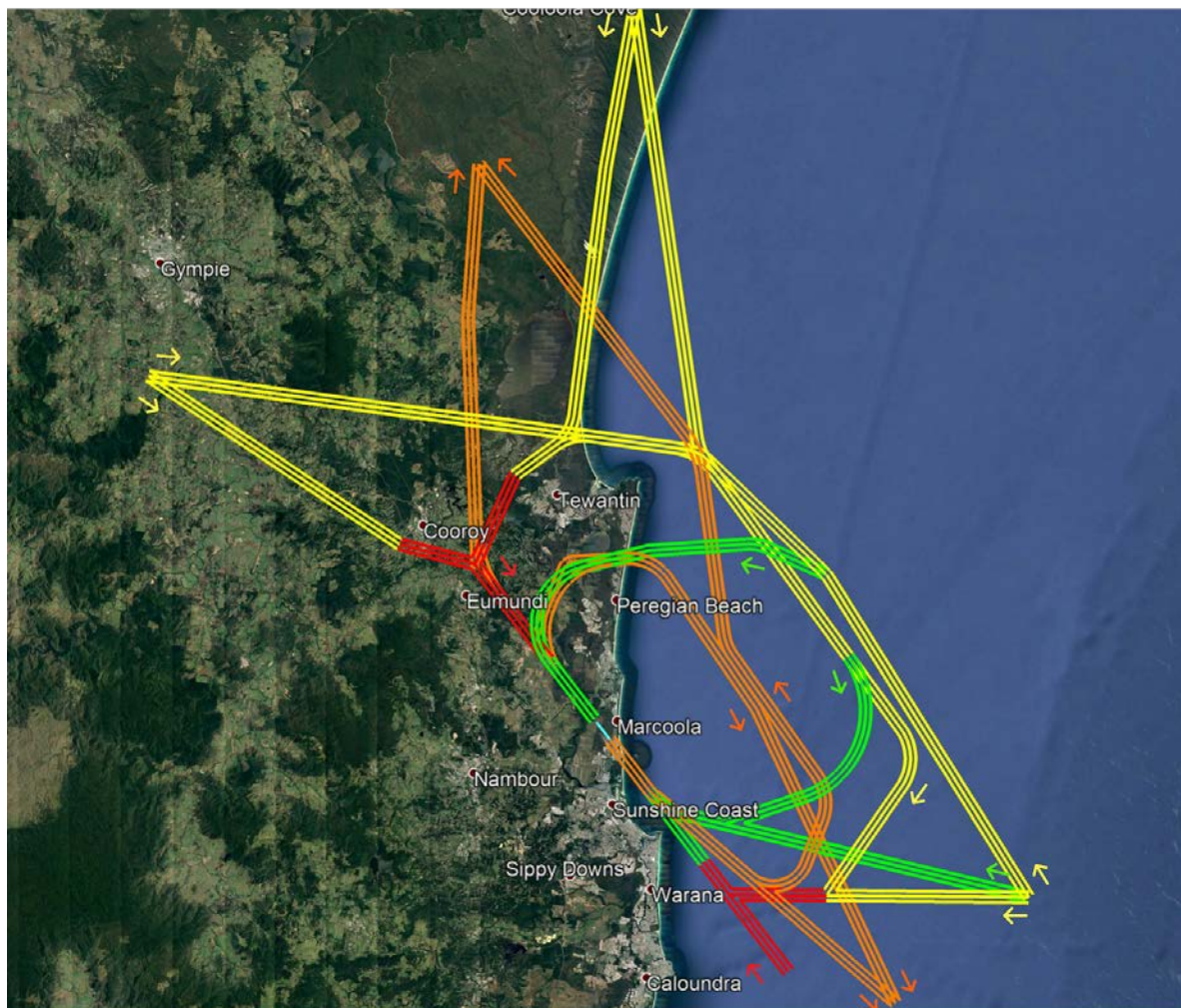
The proposed final design incorporates the necessary international and domestic regulatory requirements, and flight path design and operational requirements that ensure safety, minimises the effect of aircraft operations on the environment, and provides equity of access to all aviation operators.

The Sunshine Coast Airspace and Flight Path proposed final design:

- Ensures safety performance through:
  - Incorporating Performance Based Navigation (PBN) technologies that use satellite based technology on all approach and departure procedures, reducing the reliance on ground based ‘terrestrial’ navigation systems
  - Incorporating ‘Smart Tracking’ approach flight paths that use satellite-assisted guidance and provides on-board performance monitoring and alerting to the pilots to enable the aircraft to fly with greater accuracy and predictability than area navigation (RNAV) only approaches
  - Closed Standard Terminal Arrivals (STARs) for all major routes which provide strategic separation of arrivals and departures with Standard Instrument Departures (SIDs)
  - SIDs and STARs that provide predictable tracking for aircraft, reducing pilot and air traffic controller workload and air/ground communications
  - Appropriate segregation for safety and efficiency of airspace, to contain regular public transport (RPT) operations within controlled airspace, while providing appropriate airspace access to other aviation users.
- Minimises the effect of aircraft operations on the environment through:
  - Incorporating Continuous Descent Approaches (CDA) and Continuous Climb Operations (CCO) that use lower thrust settings to reduce the noise profile of aircraft
  - Incorporating PBN procedures that provide accurate tracking that reduce the possible location of aircraft on a flight path, and reduce the overall fuel burn and emissions of the flight operations
  - Moving the ‘Smart Tracking’ (RNP-AR) approach to Runway 31 further off the coast around Point Cartwright to join the centreline as late as possible. This means the flight path will now track approximately 2 kilometres (km) east of the coastline rather than 1.4 km off the coastline

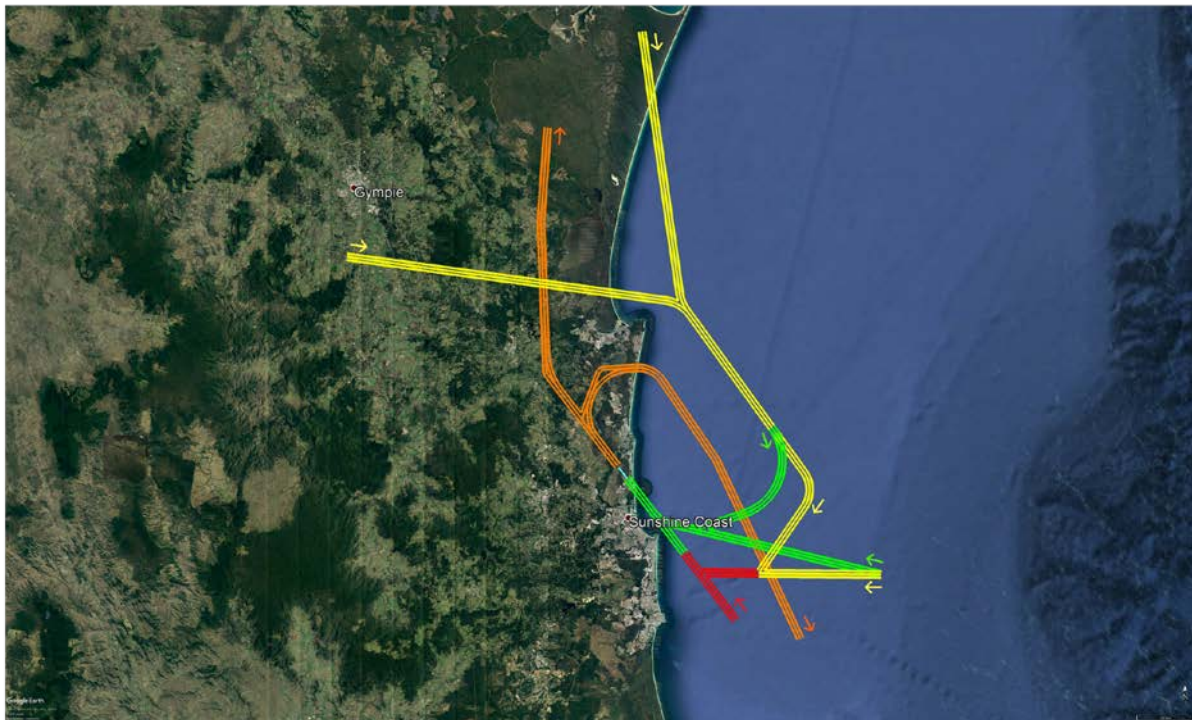


- Amendment of the Runway 31 RNAV to provide an initial approach fix (IAF) that is further over the water, contained in controlled airspace and minimises the effect of aircraft operations on the coastal communities in this area
  - Addition of Noise Abatement Procedures (NAPs) to prevent jet aircraft performing intersection departures, thereby ensuring aircraft are at higher altitudes when over residential areas
  - Increased climb gradient for all aircraft on the Runway 31 departure north to reduce noise, by ensuring a steeper climb when over residential areas
  - CDAs for the Runway 13 RNAV approach for improved environmental outcomes (noise and emissions).
- Provides equitable access for all aviation operators through:
    - requiring the minimum additional airspace to accommodate the new proposed instrument flight procedures (e.g. SIDs and STARs)
    - facilitating General Aviation (GA) operations to surrounding aerodromes, without impacting operations at Sunshine Coast airport.



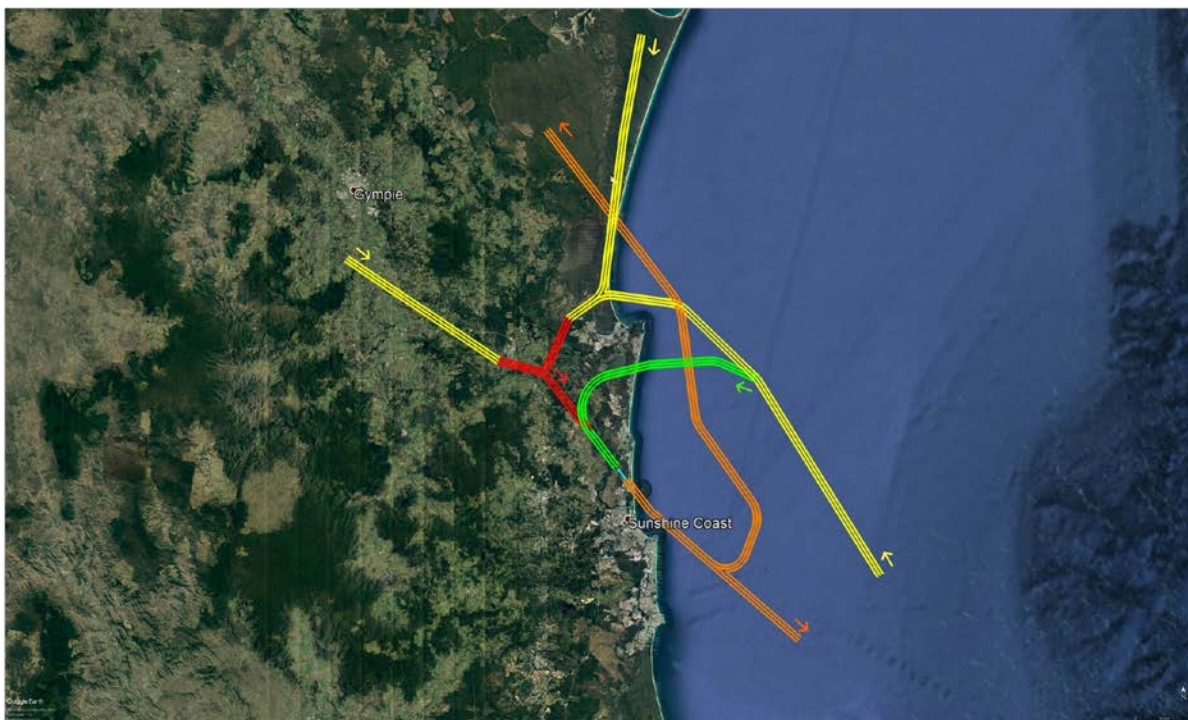
**Figure 2: Proposed Final Design Runway 13 and Runway 31 Operations**

**Yellow Track Arrivals (STARs), Orange Track Departures (SIDs), Red Track (RNAV), Green Track (RNP-AR)**



**Figure 3: Proposed Final Design Runway 31 Operations (arrivals and departures)**

**Yellow Track Arrivals (STARS), Orange Track Departures (SIDS), Red Track (RNAV), Green Track (RNP-AR)**



**Figure 4: Proposed Final Design Runway 13 Operations (arrivals and departures)**

**Yellow Track Arrivals (STARS), Orange Track Departures (SIDS), Red Track (RNAV), Green Track (RNP-AR)**



## Section 2 – Flight Path Design and Development Process

In this section we present the range of flight path design constraints, requirements, considerations and the design and decision making process that incorporated community feedback in the development of the proposed final design.

### Flight Path Design Considerations

There are a range of safety, regulatory, operational, and environmental constraints and considerations that shape the design, development and decision-making regarding flight path design.

#### Regulatory Requirements

The following are the range of flight path design international and domestic regulatory standards that define the minimum requirements for flight path design:

- International Civil Aviation Organisation (ICAO) Procedures for Air Navigation – Aircraft Operations (PANS-OPS, ICAO Doc 8168)
- ICAO Performance Based Navigation (PBN) Manual (ICAO Doc 9613)
- Civil Aviation Safety Regulation (CASR) Part 172
- Civil Aviation Safety Regulation (CASR) Part 173
- Environment Protection Biodiversity and Conservation (EPBC) Act (1999)
- Air Services Act (1995).

#### Design Requirements

The following approvals were relied upon to shape the development of the flight path designs:

- Sunshine Coast Airport Master Plan (2007)
- The Queensland Coordinator General approved Sunshine Coast Council Environmental Impact Statement (EIS) – Section D2 approved concept design (2011)
- The Department of Environment and Energy (DoEE) advice on the EPBC Act referral for 2011/6104 (2016).



## Operational Requirements

Airservices also has a range of mandates and/or requirements that define the necessary considerations for flight path design and airspace management. For the Sunshine Coast Airspace Change Management project, these included the requirements to:

- Comply with Airservices Safety and Environmental Management Systems
- Optimise PBN in accordance with Civil Aviation Safety Authority (CASA) expectations<sup>1</sup>
- Reduce reliance on terrestrial navigation systems in accordance with CASA mandates<sup>2</sup>
- Deliver airspace optimisation that provides enhanced services to aircraft flying according to Instrument Flight Rules (IFR) services while providing equitable access to aircraft flying according to Visual Flight Rules (VFR)<sup>3</sup>
- Improved flight path designs that provide for continuous climb operations (CCO) and continuous descent approaches (CDA) operations<sup>4</sup>
- Ensure an airspace architecture supports a planning horizon to accommodate foreseeable aircraft operations out to 2040, and meets the needs of all stakeholders now and into the future.

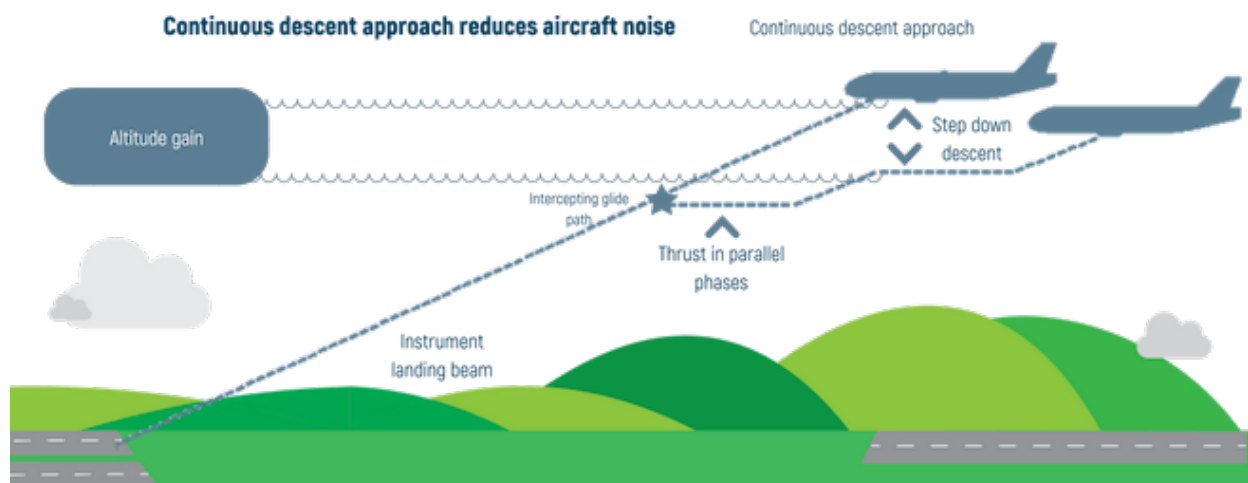


Figure 5 Example of Continuous Descent Approaches (CDA)

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<sup>1</sup> Performance-Based Navigation (PBN) in Australia - AIC a18-h05.pdf

<sup>2</sup> Performance-Based Navigation (PBN) in Australia - AIC a18-h05.pdf

<sup>3</sup> Minister Statement of Expectation 2017 to 2019

<sup>4</sup> Minister Statement of Expectation 2017 to 2019

## Sunshine Coast Flight Path Design Criteria

The following design criteria guided the design process and were incorporated into the Sunshine Coast Airport proposed flight path designs:

- Ensure consistency with the approved EIS in terms of flight path design and environmental impacts
- Minimise the effect of aircraft operations on the environment, through the concentration of flight paths over non-residential community areas where possible, through flight path design and/or the optimisation of Noise Abatement Procedures (NAPs), wherever practicable
- Accommodate the range of expected aircraft performance that will operate in the airspace, as specified in ICAO PANS OPS
- Optimise airspace management and flight path design to incorporate satellite based navigation and improvements in aircraft navigation technology and accuracy, removing the reliance on ground based navigation aids, and implement:
  - SIDs and STARs, designed in accordance with ICAO DOC 8168 and internal procedures design manuals
  - 'Smart Tracking' (Required Navigation Performance – Authorisation Required; RNP-AR) approaches with lateral and vertical guidance and terrain protection
- Include vertical guidance on RNAV approaches (BARO-VNAV)
- Design airspace that safely interfaces with surrounding airspace across the South East Queensland region
- Design flight paths that connect seamlessly with the national route structure and air traffic management network
- Design airspace that is of sufficient size to contain all arrival and departure flight paths, including possible areas of operation due to emergencies, weather diversions and/or tactical air traffic control sequencing
- Provide equity of access to all aviation operators.

## Design Development Process

Using the regulatory, design and operational requirements, Airservices air traffic control representatives and flight path designers prepared a preliminary design.

The preliminary design process did not include flight paths that had already been considered in the EIS as being unsuitable for operational safety reasons and/or noise impact on populated areas.

We then conducted a feasibility review with air traffic controllers and aviation industry operators to ensure that the design was safe, flyable and operationally suitable. Airline feedback supported the design as presented and we introduced an additional RNAV procedures for Runway 31 to accommodate the requirements of GA pilot training.

The preliminary design was then progressed to the proposed flight path design for consultation.

## Environmental Impact Assessment – Version 1

Airservices commissioned GHD, a global professional services company, to conduct a TEIA on the proposed flight path changes. The TEIA considered a range of environmental impacts including residential overflight (including noise and visual impacts), Matters of National Environmental Significance (MNES) and emissions.

The environmental assessment findings of the TEIA were consistent with the findings of the approved EIS; this was due to the similarity of the proposed flight paths compared to the EIS concept flight path corridors.

Minor variations between the results documented in the TEIA and the EIS were mainly attributable to updated inputs to the noise modelling to better reflect current and forecast airport operating conditions, aircraft movements, aircraft types and runway modes of operation. A full list of the inputs that were considered in the environmental modelling are included in the Appendices within the TEIA.

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### [Targeted Environmental Impact Assessment Fact Sheet](#)

[Airservices proposed flight paths at Sunshine Coast Airport TEIA Part 1 \(March 2019\)](#)

[Airservices proposed flight paths at Sunshine Coast Airport TEIA Part 2 \(March 2019\)](#)

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We then consulted community stakeholders on the proposed flight path design and sought feedback. This feedback was collated, analysed and considered within the context of shaping the proposed final flight path and airspace design.

## Section 3 – Consideration of Community Feedback

### Community Engagement

We conducted a six week community consultation on the Sunshine Coast proposed airspace and flight path changes between 20 March 2019 and 30 April 2019.

We received over 4,500 submissions which contained feedback on a range of topics. Submissions were analysed across the range of themes and, where appropriate, the elements of the proposed flight path design that they related to.

We prepared two Summary of Feedback reports that describe the community consultation approach, feedback received from community stakeholders, and the methodology and outcomes of our thematic analysis.

The first Summary of Feedback report (Part 1 Consultation Areas) related to the feedback received from the specific communities where the proposed flight paths varied from the concept flight path corridors in the approved EIS.

The second Summary of Feedback report (Part 2 General Areas) related to the feedback received from communities where the proposed flight paths were consistent with the concept flight path corridors in the approved EIS

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[Summary of Feedback – Part 1 \(Consultation Areas\) Updated](#)  
[Summary of Feedback – Part 2 \(General Areas\)](#)

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On 5 July 2019, we hosted a Stakeholder Roundtable meeting with representatives from Federal, State and local government, Sunshine Coast Airport, regional development and community associations, to present Airservices Proposed Final Design and Consideration of Feedback.

### Technical Review of Feedback

The consideration of feedback process consisted of several internal workshops where subject matter experts from the areas of operations, flight path design, environment and community engagement, examined the thematic analysis and sample submissions from community members.

The focus of these workshops was on the community feedback that provided suggestions and/or alternative flight paths that could be considered in the context of developing the proposed final flight path designs.

We considered feedback that may help:

- Shape the final location of the flight paths
- Inform the operational use of the flight paths
- Provide consideration for future improvements of the airspace design.

Feedback not related to flight path designs was considered through other workshops:

- Feedback that focussed on themes of environment, including environmental impacts of the flight paths on residential areas, were collated and considered in conjunction with the approved EIS and the review of the TEIA.



- Feedback that focussed on our consultation methodology, including requests for extensions to the consultation period, has been considered as part of our continuous improvement activities.
- Themes that related to other matters, including requests for a curfew, the EIS planning and approvals process, and/or current runway operations were recorded and included in discussions and summary reports provided to the SCC and SCA.

## Consideration of Feedback – Flight Paths

This section describes the proposed flight paths in terms of each flight path design element (e.g. Runway 13 RNAV, Runway 31 Departure).

For each flight path design element we present:

- the technical design intent
- the community feedback on that flight path design element
- how we considered the feedback in shaping the proposed final design
- the outcome of our considerations.

Generally, analysis of community feedback where the Airservices proposed design varied from the concept flight path corridors in the approved EIS, indicated that community sentiment was broadly accepting of the majority of design elements. This was attributed to the moving of flight paths so as to enable reduced direct overflight near several communities, and the potential for aircraft distribution across flight paths in the proposed final design.

Community feedback in the areas where the proposed flight path designs were contained within the concept flight path corridors in the approved EIS, was generally negative regarding flight paths.

Many community members requested that Airservices consider a range of adjustments to the proposed final design including:

1. Removal of the flight paths completely
2. Flight path re-design
3. Aircraft distribution across the flight paths
4. Noise abatement procedures (NAPs).

## Noise Abatement Procedures

Noise Abatement Procedures (NAPs) are designed to reduce the impact of aircraft noise on the community. They include procedures for runway use and flight paths to reduce flights over residential areas, as well as the designation of noise abatement areas, where applicable.

There are currently NAPs in place for Sunshine Coast Airport.

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### AIP ERSA - Noise Abatement Procedures - Sunshine Coast Airport (23 May 2019)

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This section describes the proposed NAPs changes to support the operational use of the new runway in May 2020.

#### **1. PREFERRED RUNWAYS**

##### *1.1 Preferred Runways for jet aircraft:*

- *Landing – Runway 31*
- *Take-off – Runway 13*

#### **2. PREFERRED FLIGHT PATHS FOR ACFT ABOVE 5700KG**

##### *2.1 Where possible all arriving and departing aircraft to track via SIDs and STARs.*

#### **3. TRAINING FLIGHTS**

*See AIP/ERSA*

#### **4. OTHER RESTRICTIONS**

##### *4.1 Aircraft above 5,700kg operating between 2300 and 0530 HR local time, require prior approval from SUNSHINE COAST AIRPORT PTY LTD.*

##### *4.2 Jet aircraft must not conduct an intersection departure from A1*

##### *4.3 Jet Noise Abatement climb procedures apply H24 RWY13*

In the following section, for each design element, we examine:

- the technical design intent
- consideration of the community feedback and
- the outcome of that consideration as it relates to the proposed final design.

We also received numerous community submissions proposing alternative flight paths and/or approaches.

Where they have been considered in the context of the proposed design element, they are included in this section. A description of proposed alternative flight paths and/or approaches, and our consideration are also presented in Section 4.

## Design Elements - where we proposed variations to the approved EIS

Re-design of the Runway 13 RNAV arrival flight paths to the north/northwest of the new runway will no longer track over the east of Cooroy or near Pomona

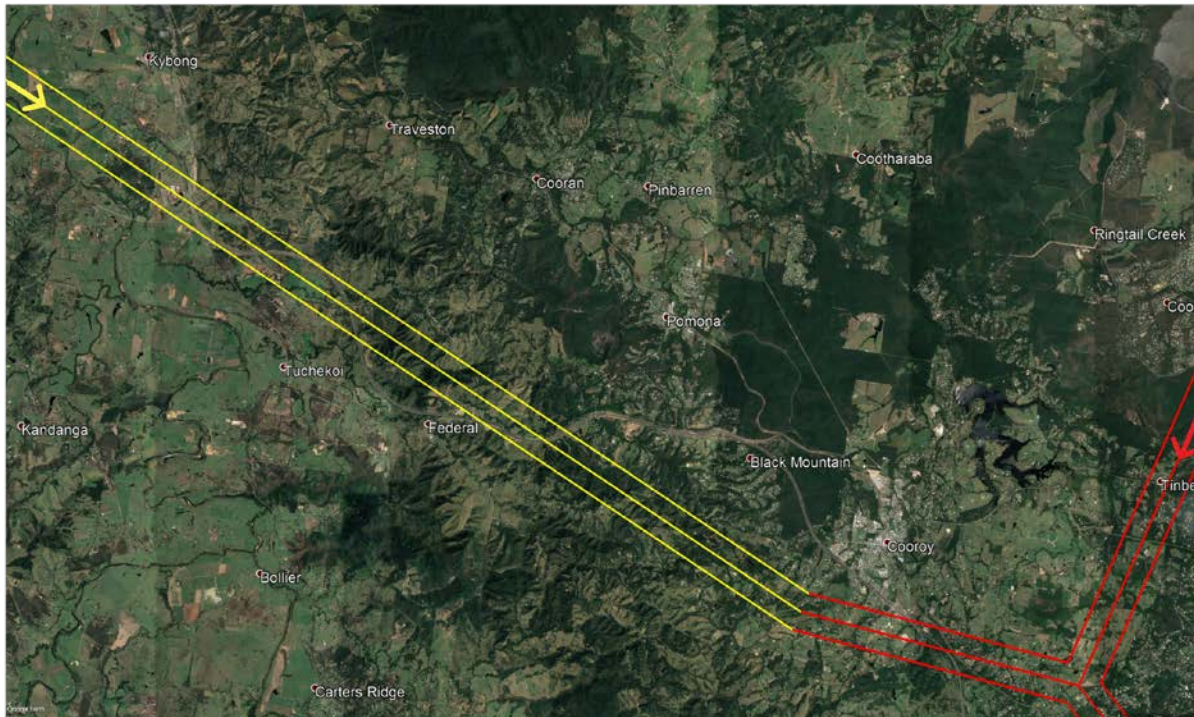


Figure 6: Runway 13 Arrivals - Yellow Track Arrivals (STARS), Red Track (RNAV)

This flight path design element included moving the flight path further south than the approved EIS concept flight path corridor, so as to reduce the effect of aircraft noise on some communities by reducing direct overflight.

**Consideration:**

This design element was generally accepted by community members without further feedback that could improve its design.

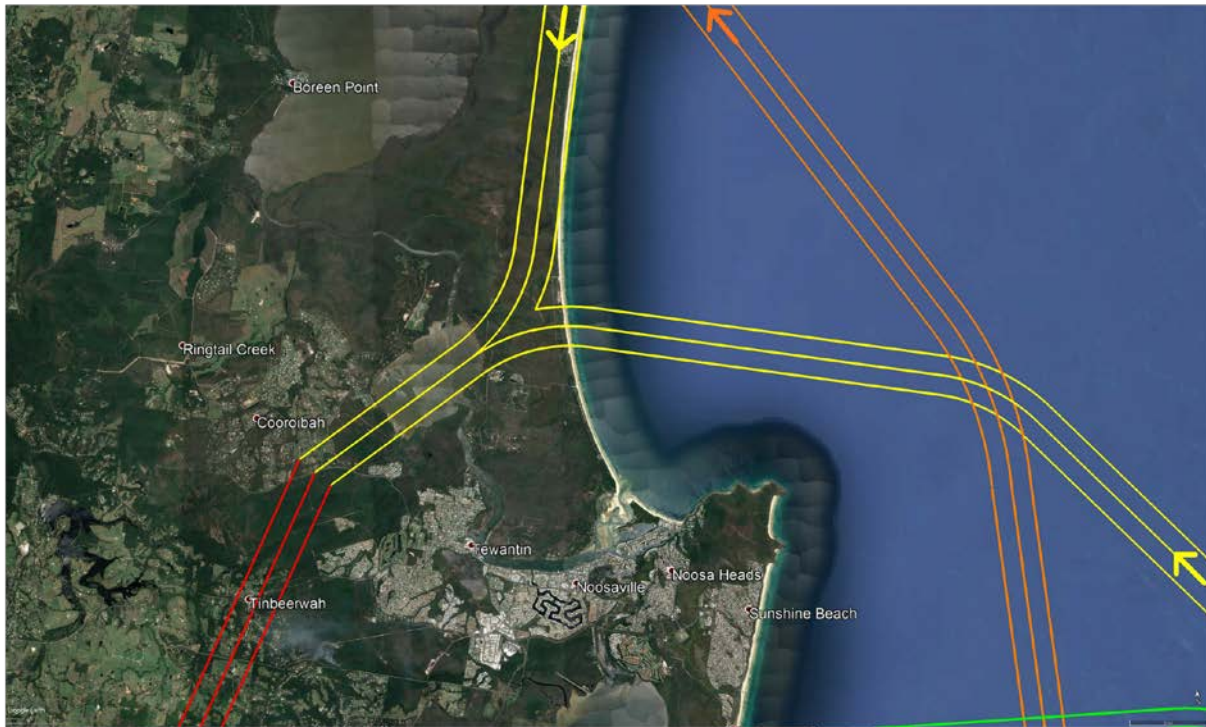
This flight path will generally be used by traffic inbound from the west.

At the time of implementation it is expected that the level of operations from the west will be an average of 1 flight per week.

**Outcome:**

This design element has been incorporated in the proposed final design.

**Re-design of the Runway 13 RNAV arrival flight path from the north, including removal of the flight path that would have tracked to the west of Boreen Point.**



**Figure 7: Runway 13 operations (arrivals and departures)**  
**Yellow Track Arrivals (STARS), Orange Track Departures (SIDS), Red Track (RNAV)**

Flight paths to and from the north as depicted in the EIS were simplified to better support operational requirements and to connect with the national air traffic management network.

A key aspect of this flight path design element included removing the arrival flight path that tracked west of Boreen Point. The proposed flight paths remain over water for as long as possible, or traverse close to the coast, so as to reduce residential overflight and other environmental impacts.

The proposed flight path was also adjusted to avoid direct overflight over the majority of the community of Cooroibah, and to connect with the RNAV approach at the point that created the least community impact, while ensuring safe and stable approaches to Sunshine Coast Airport.

***Consideration:***

This design element, as it relates to the removal of flight paths and the reduction of direct community overflight, was generally accepted by stakeholders without further feedback that could improve its design.

Residents were concerned about the potential for increased noise from aircraft operations in this area, and expressed the need for aircraft to be distributed across the two arrival/approach paths (RNAV and 'Smart Tracking' (RNP-AR)).

At the time of implementation, when Runway 13 is in use:

- the proposed flight path from the north may be used by aircraft arriving from northern airports including international arrivals, when they commence operations
- the proposed flight path from the south is expected to be used by aircraft arriving from southern airports which are either not able to use the 'Smart



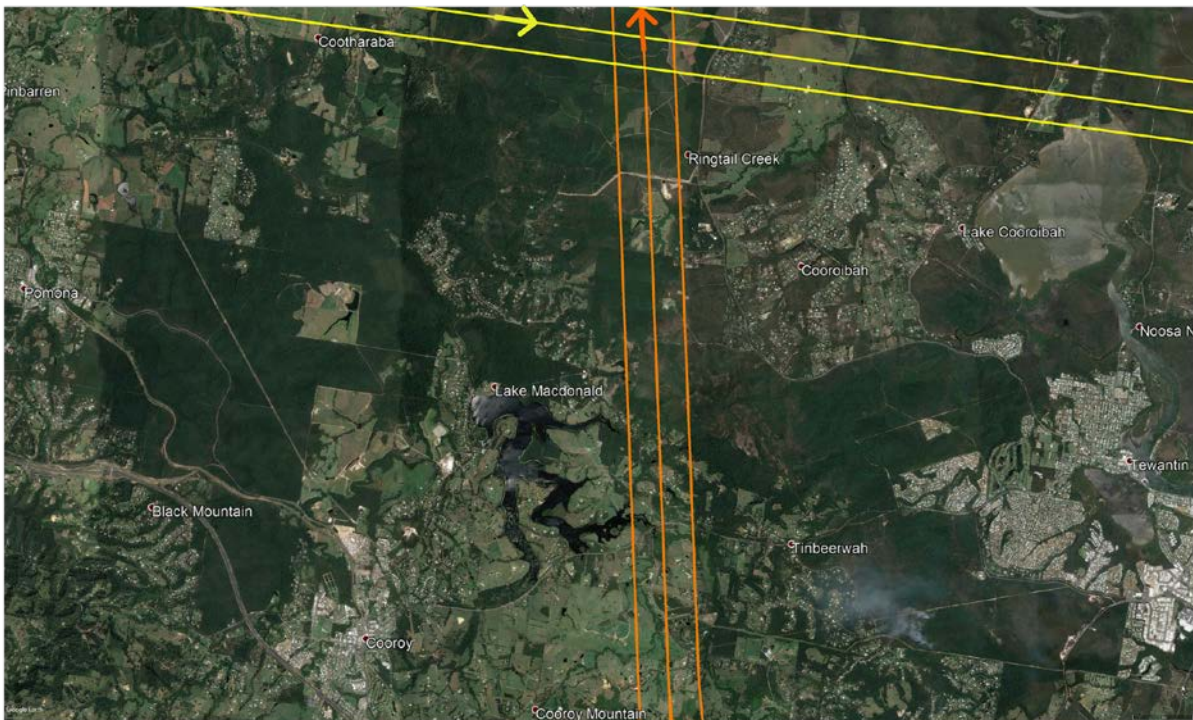
Tracking' (RNP-AR) approach, or are required to use this flight path for operational reasons (i.e. sequencing, weather avoidance etc.).

This is expected to be approximately 20% of arriving aircraft.

**Outcome:**

This design element has been incorporated in the proposed final design.

**Re-design of the Runway 31 departure flight path to the north has been relocated away from Cootharaba and Lake MacDonald**



**Figure 8: Runway 31 Operations (arrivals and departures)**  
Yellow Track Arrivals (STARS), Orange Track Departures (SIDS)

A key aspect of this flight path design element included moving the departure flight path in the EIS concept corridor to the east of Lake MacDonald, over less populated areas and away from Cootharaba and to ensure that Sunshine Coast had a route network that would enable it to connect with the national air traffic management network.

**Consideration:**

This design element was generally accepted by stakeholders without further feedback that could improve its design.

At the time of implementation it is expected that the level of operations departing to the north will be an average of 1 flight per week.

Some community members were concerned about the noise associated with the departure flight path. We reviewed the departure flight path to identify where we could provide a steeper climb gradient so as to have aircraft overfly communities at a higher altitude and to minimise the effect of aircraft noise on these communities.

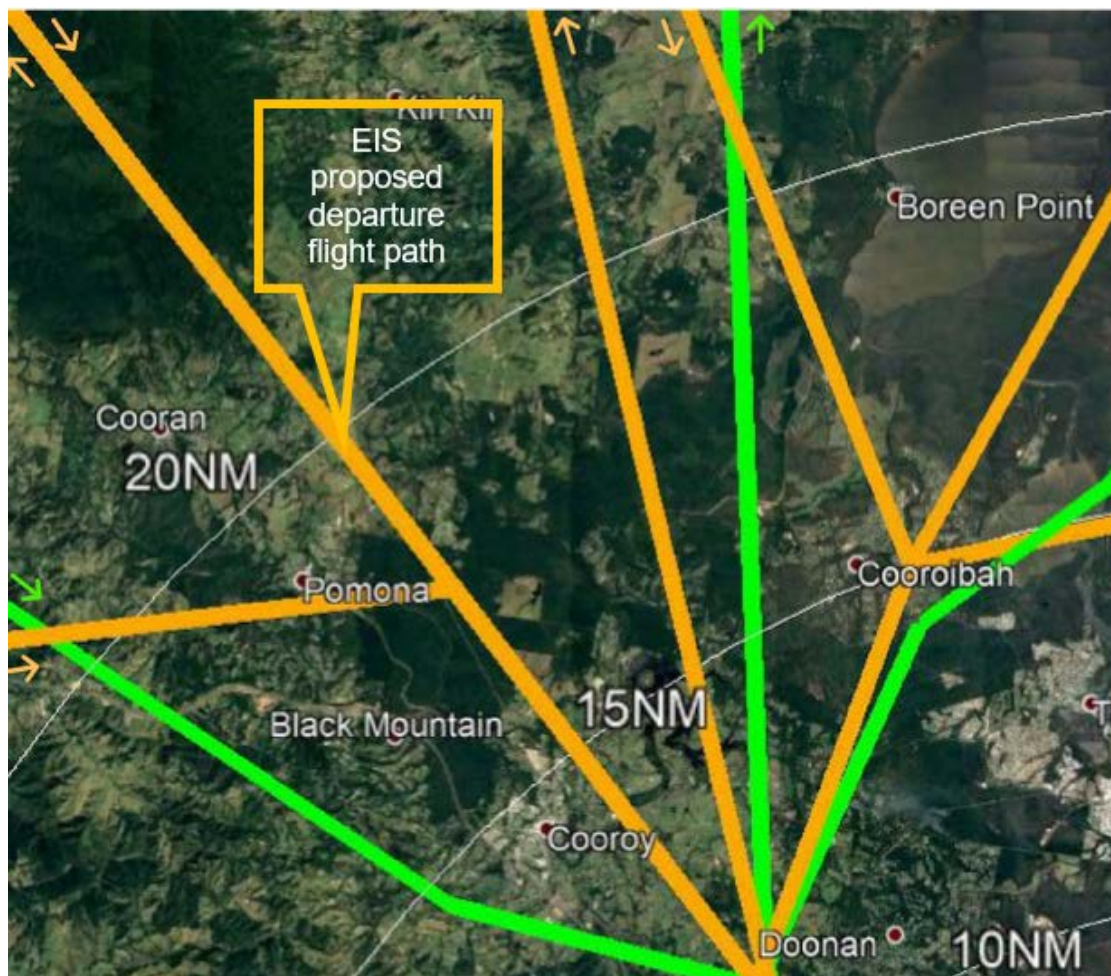
**Outcome:**

An amendment to the climb gradient for this departure path has been made to 7%, resulting in departing aircraft achieving higher altitudes and minimising the effect of aircraft noise on the communities overflown.

NAPs will restrict jet aircraft from conducting intersection departures, to ensure aircraft are at higher altitudes when operating over residential areas.

This design element has been incorporated in the proposed final design.

The Runway 31 departure flight path to the northwest (near Cooroy and Pomona), that mirrored the arrival flight path, and proposed in the EIS has been removed from the design.



**Figure 9: Proposed design compared to approved EIS Concept Design** (*illustrative representation only*)  
Orange flight paths = EIS arrivals and departures, Green flight paths = Airservices proposed design arrivals and departures

A key aspect of this flight path design element included removing a departure flight track that was not required for air traffic control operations (highlighted above) based on the adjusted forecast of aircraft movement operations. The removal of this flight path will minimise the effect of aircraft noise and operations on the community.



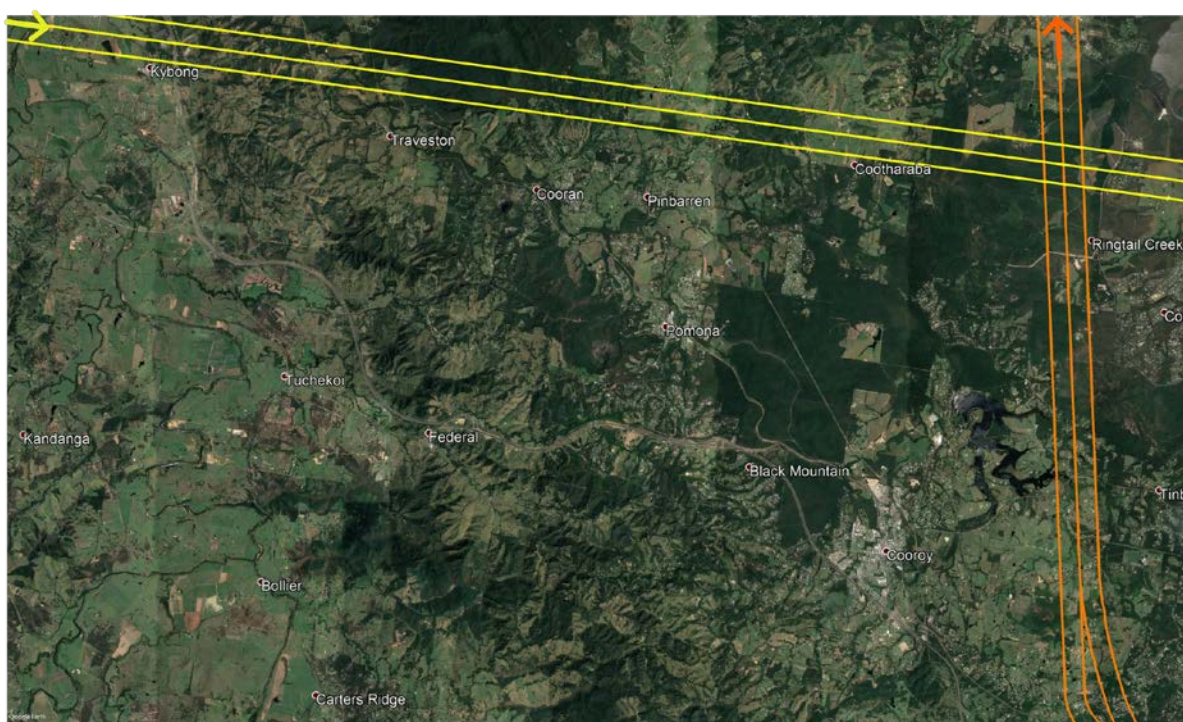
**Consideration:**

This design element was generally accepted by stakeholders without further feedback that could improve its design.

**Outcome:**

This design element has been incorporated in the proposed final design.

**The Runway 31 arrival flight paths from the northwest includes a high altitude flight path for operations above 10,000 feet, near Cootharaba**



**Figure 10: Runway 31 Operations (arrivals and departures) - Yellow Track Arrivals (STARS), Orange Track Departures (SIDS)**

The proposed flight path was created to support arrivals from the north to Runway 31, that would cross overhead communities at a high altitude and the continue over water before turning back further south for a Runway 31 arrival.

**Consideration:**

This design element was generally accepted by stakeholders without further feedback that could improve its design.

It is intended for use by traffic inbound from the west and northwest from locations such as Emerald, Galilee Basin and international locations such as Singapore and Indonesia.

At the time of implementation it is expected that the level of operations will be an average of 1 flight per week.

**Outcome:**

This design element has been incorporated in the proposed final design.

## Design elements that are within the approved EIS concept corridors

### The Runway 31 departure over water and to the south

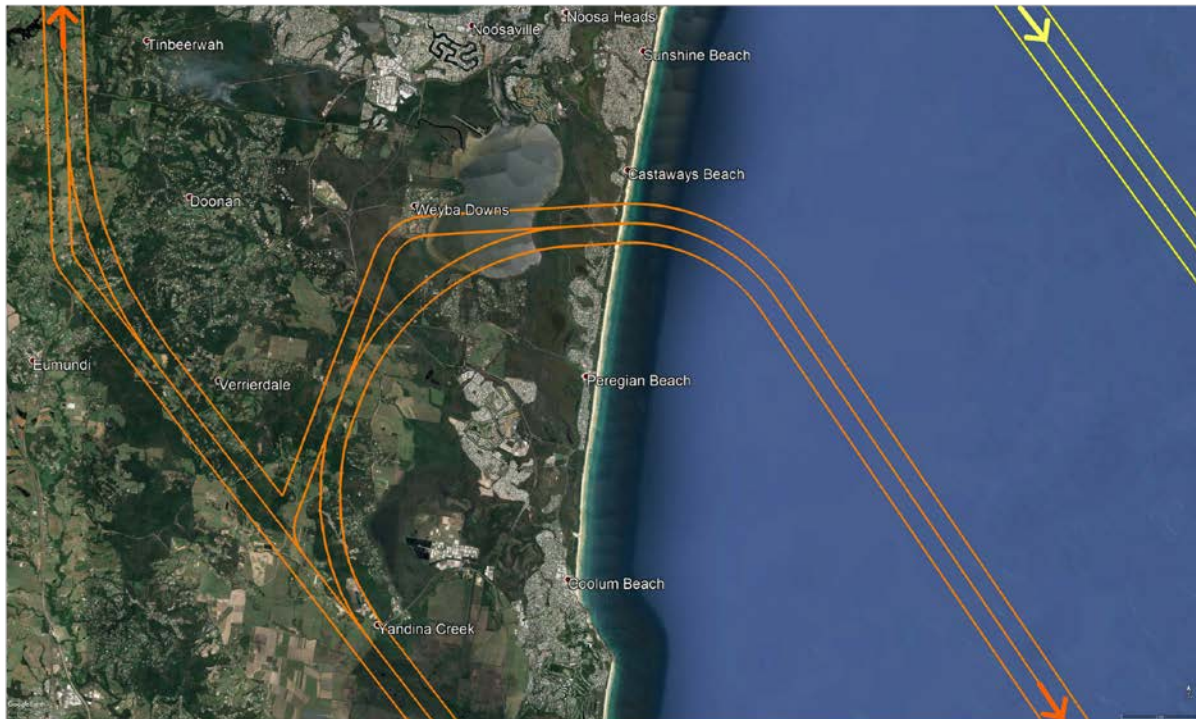


Figure 11: Runway 31 departures - Yellow Track Arrivals (STARS), Orange Track Departures (SIDS)

A key aspect of this flight path design element included ensuring that the proposed final departure path was threaded between communities and tracked over less densely populated and/or non-residential areas, wherever possible, so as to reduce the direct overflight and associated aircraft noise in residential areas and to facilitate flight over water as soon as possible.

#### **Consideration:**

This flight path was designed within the concept flight path corridors contained in the approved EIS.

Some community members were concerned about the departure flight path overflying the same communities that were underneath or near the arrival flight path.

The departure flight path could not be adjusted further north or south without directly overflying more populated residential areas. The proposed flight path utilises tracking over less densely populated residential areas near the coast, and includes tracking points known as 'waypoints' that will contain the aircraft operations as much as possible, so as to reduce the area of potential flight.

The climb gradient for this departure path is greater than 6%.

At the time of implementation, based on runway mode which is determined by wind conditions this flight path will facilitate an average of 25% of operations.

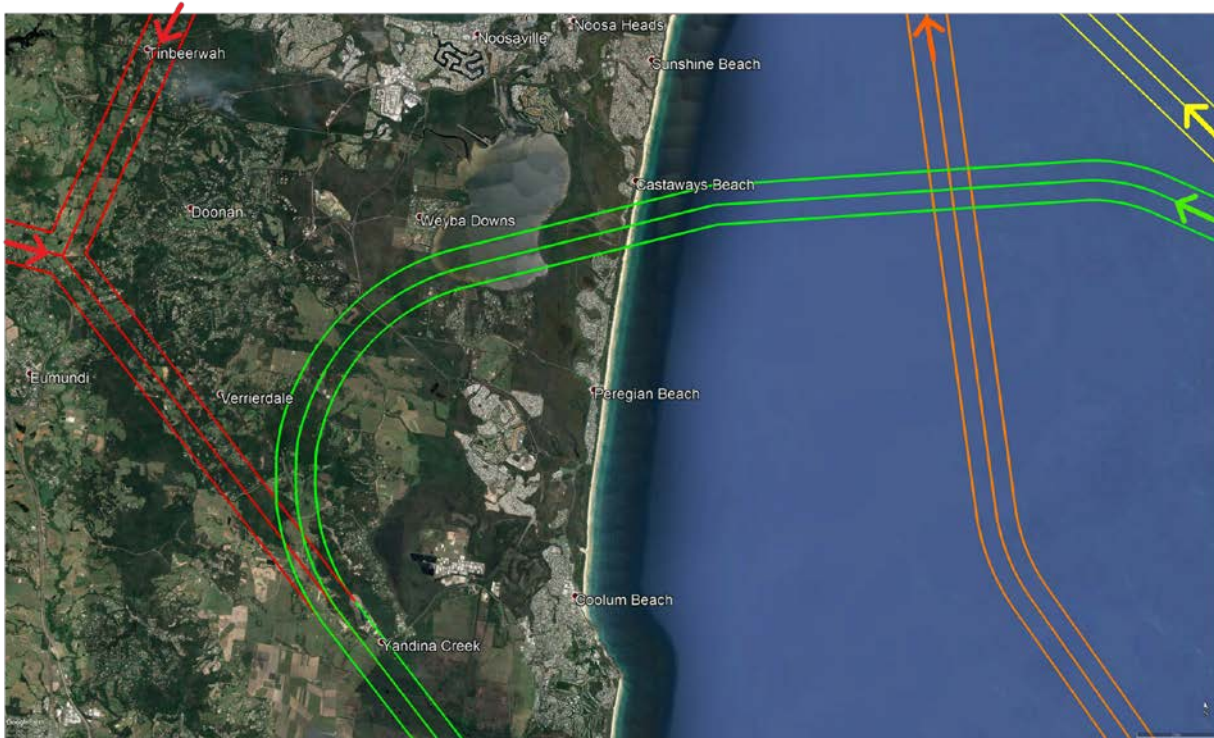
#### **Outcome:**

NAPs will restrict jet aircraft from conducting intersection departures, to ensure aircraft are at higher altitudes when operating over residential areas.

This design element has been incorporated in the proposed final design.



## The 'Smart Tracking' (RNP-AR) approach flight path over water to Runway 13



**Figure 12: Runway 13 Operations (arrivals (green track) and departures (Yellow Track Arrivals (STARS), Orange Track Departures (SIDS), Red Track (RNAV), Green Track (RNP-AR))**

A key aspect of this flight path design element included ensuring that the 'Smart Tracking' (RNP-AR) approach path within the approved EIS concept flight path corridors was threaded between communities and tracked over less densely populated and/or non-residential areas, wherever possible, so as to reduce the direct overflight and associated aircraft noise in residential areas and to minimise flight over land.

### **Consideration:**

This design element was within the concept flight path corridors contained in the approved EIS.

Community members expressed strong opposition to having the 'Smart Tracking' (RNP-AR) approach over their community and either requested that either all flights should operate on the RNAV flight path to the north, or requested alternative proposals to be considered to the west of the airport.

Community members sought a range of adjustments to the proposed design, however, many of these did not comply with a range of ICAO based design concepts and requirements (e.g. point at which aircraft is established on final approach in a stable configuration or offset approaches) and/or could not be incorporated without increasing direct residential overflight in populated areas.

The response to these alternative proposals is provided in Section 4 – Consideration of Feedback - Alternative Flight Paths Submitted by the Community.

Some community members were concerned that an apparent amendment had been made to the operational description in the approved EIS that changed the description of the 'Smart Tracking' approach from 'secondary' to 'primary' over the Marcus Beach and Marcus Dunes areas.

They believed that this change of terminology would alter the number of aircraft operating on the proposed flight path.

In reviewing the narrative and the graphic that mentioned 'primary' and 'secondary' corridor in the EIS, we identified that there was the potential for confusion among community members about aircraft type, number and operations on each of these flight paths.

With reference to the text below from the EIS, the use of the term 'secondary' was intended to identify that there were 2 approach paths to this airport from the south. It was not intended to reflect forecast aircraft utilization across each flight path.

**SCAEP EIS Extract D2-178 2.9**

*Secondary Approach and Departure Corridor*

*This is a secondary corridor that has been established to provide an efficient second flight path for aircraft arriving from, and departing to southern destinations such as Sydney and Melbourne.*

*This corridor provides a shorter flight path for arriving aircraft able to carry out some types of advanced GPS based instrument approach procedures which can accommodate turns, as well as providing a suitable flight path for aircraft making visual approaches.*

Consideration was given to airline industry requests for visual approach procedures for jet aircraft onto Runway 13. We made a determination not to proceed with the request as it could expose Marcus Beach residents to potential increased overflight and associated aircraft noise.

At the time of implementation, when Runway 13 is used for arrivals, this flight path will facilitate an average of 80% of arriving aircraft operations from the south.

**Outcome:**

This design element has been incorporated in the proposed final design.

## The Runway 13 departure

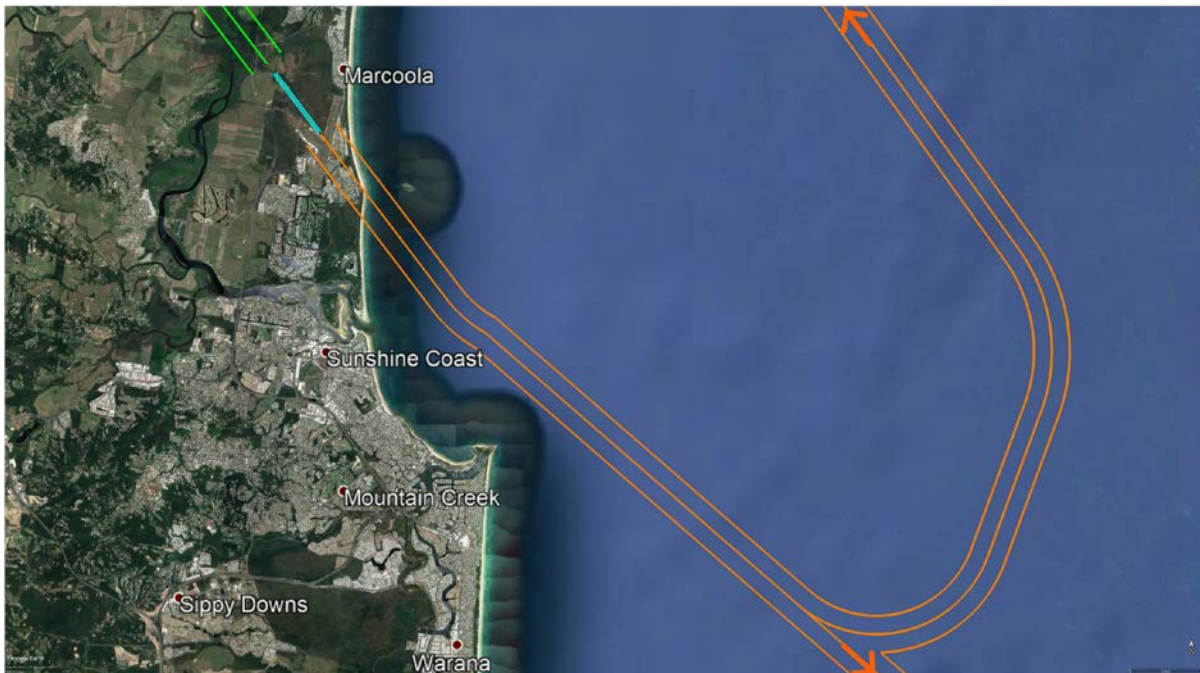


Figure 13: Runway 13 Operations (departures) - Orange Track Departures (SIDS), Green Track (RNP-AR)

A key aspect of this design element included departing off Runway 13 to track over water as soon as possible and turn left as early as possible to keep the track off the coast.

### **Consideration:**

This design element was within the concept flight path corridors contained in the approved EIS.

Some community members requested the aircraft turn slightly left after take-off to remain over parklands and reserve areas.

Given the proximity of populated communities to the eastern end of the runway it was determined that the flight path should not be adjusted.

We examined the operations of aircraft and identified that maneuvering the aircraft at low level actually increases the aircraft noise footprint.

At the time of implementation, when Runway 13 is used for departures, this flight path will facilitate an average of 75% of operations.

### **Outcome:**

NAPs will restrict jet aircraft from conducting intersection departures, to ensure aircraft are at higher altitudes when operating over residential areas.

This design element has been incorporated in the proposed final design.

## The Runway 31 arrival RNAV

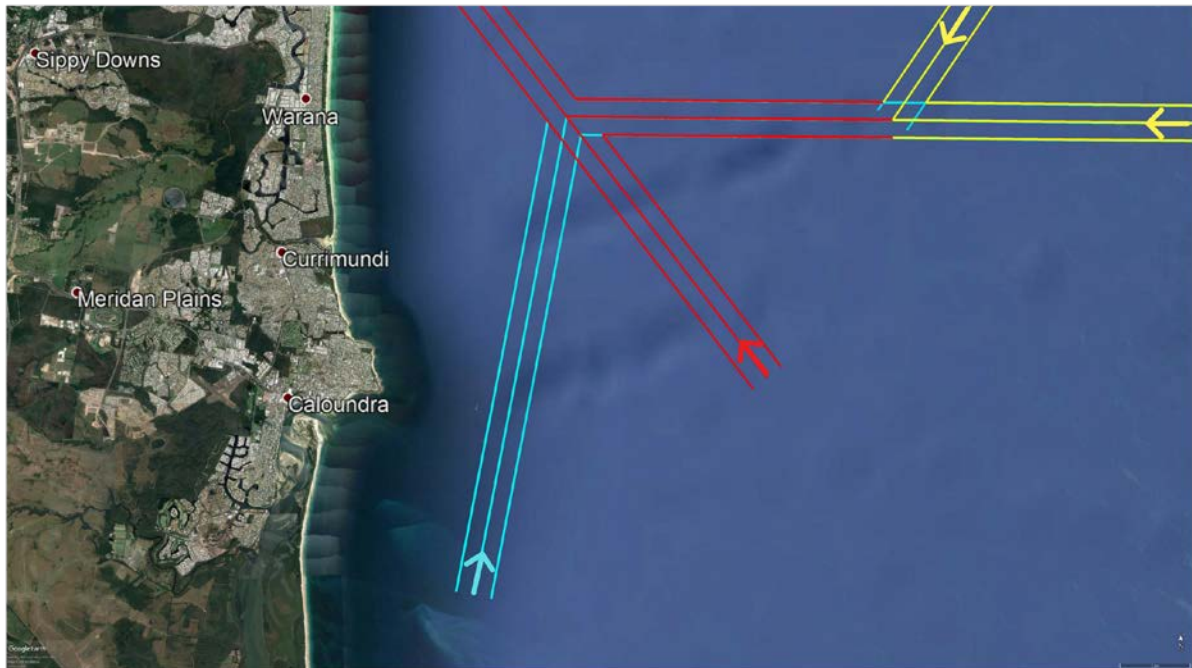


Figure 14: Runway 31 operations (arrivals) - Yellow Track Arrivals (STARS), Red Track (Proposed final design RNAV) Blue Track (Proposed design RNAV Track – will not be incorporated in the final design)

A key aspect of this design element included the provision of RNAV approaches to Runway 31 for both regular passenger transport traffic and general aviation instrument flight rules (GA IFR) training operations from the south and reduce the proposed size of airspace required overhead Caloundra.

### **Consideration:**

This design element was within the concept flight path corridors contained in the approved EIS.

There was minimal response from the community on this design element. However, we examined ways to move aircraft operations further over water to minimise the impact of aircraft on coastal communities.

We examined adjusting the centre initial approach fix (IAF) for Runway 31 RNAV a further 5km over water so as to contain light aircraft operations over water and reduce the number of these aircraft flying close to Caloundra.

This flight path will generally be used for flight training aircraft and some general aviation operations.

### **Outcome:**

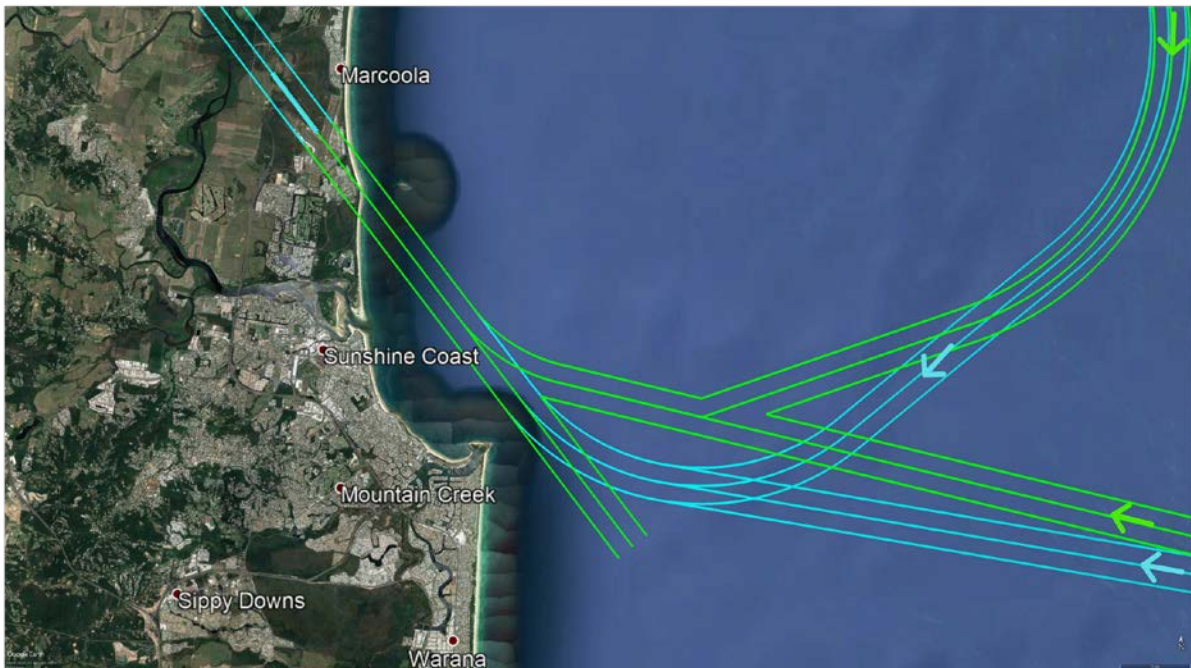
An amendment has been made to remove the left initial approach point from Runway 31 RNAV. By adjusting the RNAV, aircraft will operate further away from coastal communities, minimising the noise and visual impacts of aircraft operations.

The proposed design was approximately 3.5km off the coast, and the proposed final design will now have aircraft operating on this flight path approximately 8.5km off the coast.

This design element has been incorporated in the proposed final design.



## The Runway 31 'Smart Tracking' RNP-AR arrival



**Figure 15. Runway 31 operations (arrivals)**  
**Green Track (Proposed final design RNP-AR), Blue Track (Proposed design RNP-AR – will not be incorporated in the final design)**

A key aspect of this design element included the provision of 'Smart Tracking' (RNP-AR) approach procedures for Runway 31 from the STAR.

### **Consideration:**

This design element was within the concept flight path corridors contained in the approved EIS.

There was minimal response from the community on this design element. However, we examined ways to move aircraft operations further over water.

The proposal minimises the effect of aircraft operations on the community by reducing the proximity of operations near coastal communities.

At the time of implementation, when Runway 31 is used for arrivals, it is expected that this flight path will cater for 80% of arriving aircraft operations.

### **Outcome:**

An amendment to Runway 31 'Smart Tracking' (RNP-AR) arrivals has been made to ensure the flight path is contained over water for as long as possible, prior to crossing the coast.

While maintaining safety and providing efficiency, this will keep the aircraft off the coast near areas such as Mooloolaba and Point Cartwright by a further 600-700 metres when compared to the proposed design.

This design element has been incorporated in the proposed final design.

## Runway 31 Departure and Runway 13 Arrival - Lake Weyba



Figure 16. Runway 13 operations (arrivals) – Green Track Arrivals (RNP-AR)

Effect of the proposed flight paths specifically on Lake Weyba and its surrounds.

### **Consideration:**

This design element was within the concept flight path corridors contained in the approved EIS.

Some residents expressed their concerns about Lake Weyba and the Wetlands further to the north. Residents were concerned that aircraft using the 'Smart Tracking' (RNP-AR) approach, regardless of altitude or noise output, would impact on the peaceful enjoyment and amenity of this natural asset.

A TEIA was conducted on the proposed airspace and flight path changes and included an assessment of the potential environmental impacts on Lake Weyba and surrounds.

The findings of the TEIA were consistent with the findings of the approved EIS.

Flight paths that would avoid Lake Weyba would result in increased residential overflight over populated areas.

### **Outcome:**

This design element has been incorporated in the proposed final design.

## Section 4 – Consideration of Community Feedback – Alternative designs

We received a number of submissions from the community that included alternative flight path designs.

Some submissions included illustrative representations, while others described the alternative flight paths designs in written form. We have endeavoured to interpret these alternatives within the context of flight path design and development.

Where submissions were similar or related, we have grouped these together.

We first considered whether the submission was within the context of the approved EIS concept flight paths. This was to identify if there were alternative flight path designs that could be further assessed for inclusion in this current proposed design.

Alternative flight path designs submitted that were outside the approved EIS concept flight paths were not able to be progressed at this time.

Regardless, all alternatives were considered in the context of the design requirements and considerations, so as to determine the safety, operational feasibility and/or flyability of the alternative, and to consider the potential impacts on communities, particularly residential areas. Where they have been considered in the context of the proposed design element, they are included in Section 3.

A description of proposed alternative flight paths and/or approaches, and our consideration are also presented in this section.

In accordance with *Airservices Commitment to Aircraft Noise Management*, we will maintain a register of possible alternatives that meet the minimum safety and operational feasibility requirements, and will actively investigate changes which may deliver improved noise outcomes for the community in the future, including a review of Air Traffic Management (ATM) procedures where appropriate.

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[Airservices Commitment to Aircraft Noise Management](#)

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### Over Water and Western Approach Option (no Noosa Council area overflight)

Some community submissions asked for an alternate south western approach so as to contain flight operations within Sunshine Coast Council areas and use existing flight paths wherever possible.

This approach was referred to as 'a right hand circuit' with aircraft approaching from the south over water to fly a new corridor that runs south and then west of the airstrip and makes a right hand turn between Eumundi and Nambour to join the flight paths to Runway 13 and Runway 31.

Some community members asked that all inbound aircraft make a right hand south west approach to Runway 13 via a STAR approach that positions all RPT aircraft to meet the Final Approach Fix at 6 nautical miles (NM) or the extended Runway 13 centre line at 10 NM from the runway threshold.

This would have aircraft arriving from the south and tracking to a point either east or west of Nambour.

#### **Consideration:**

A south western approach was not contained within the EIS concept corridors.

The proposal was difficult to assess as it was presented based on a runway orientation that did not align with the new runway.

While it presents STARs and SIDs in the design, these are not able to progress as the SIDS and STARs would not be strategically separated.

This would then infringe on the ability to implement CDA and CCOs.

It would require aircraft to unnecessarily operate in close proximity to terrain due to the flight path operating in areas of increased elevation on that side of the airport.

For Runway 13 there would be increased overflight of populated community areas including Buderim, Maroochydore, and Montville.

The approach does not meet multiple design considerations including keeping aircraft over non-residential areas wherever possible. East Coast operations utilise over the water designs wherever practicable for this reason.

The approach would require additional controlled airspace to the west of Sunshine Coast Airport which would have a negative effect on general aviation activities in the region and does not meet with Airservices requirement to maintain equity of access for all airspace users.

In summary, this alternative is not feasible for the new runway operations at the Sunshine Coast.

#### **Outcome:**

This alternative has not been incorporated in the proposed final design.

## Over land Western Option

Some community submissions asked for an alternate 'western' option for traffic arriving to Runway 13 and departing from Runway 31, where traffic would operate inland of the Sunshine Coast and to the west of Brisbane.

The community members believed that this would be over mostly rural and 'low density' bushland and that the paths would arrive and depart the airport from the west resulting, in a shorter approach for aircraft arriving from the south.

### **Consideration:**

A direct western approach was not contained within the EIS concept corridors.

The proposal is not compatible with Runway 31 operations as the submission did not include an approach for Runway 31, and could not accommodate traffic management as a result of a change of runway mode while the aircraft is on arrival.

The approach does not meet multiple design considerations including keeping aircraft over non-residential areas wherever possible. East Coast operations utilise over the water designs wherever practicable for this reason.

The proposal appears to have a single 'Smart Tracking' (RNP-AR) approach path to Runway 13 which would exclude a number of operators who are not authorised to use this approach. Airservices designs approach paths that include both RNAV and 'Smart Tracking' (RNP-AR).

It would require aircraft to unnecessarily operate in close proximity to terrain due to the flight path operating in areas of increased elevation on that side of the airport.

It is not able to safely integrate with the South East Queensland operations and it would create the potential for separation issues arriving to Brisbane from the north of the Sunshine Coast.

The approach would require additional controlled airspace to the west of Sunshine Coast Airport which would have a negative effect on general aviation activities in the region, and does not meet with Airservices requirement to maintain equity of access for all airspace users.

In summary, this alternative is not feasible for the new runway operations at the Sunshine Coast.

### **Outcome:**

This alternative has not been incorporated in the proposed final design.



### Arriving aircraft to Runway 13 – adjusted northern approach to the RNAV

Some community submissions asked for an alternate approach option further north over less populated areas.

This approach involves arriving aircraft tracking from the north along the southern shore of Lake Cootharaba, turning south over less populated areas including Ringtail State Forest and Cooroy Mountain.

Some community submissions requested that aircraft fly down the middle of Lake Cootharaba east of Boreen Point, tracking between Ringtail State Forest and Cooroibah and east of Lake MacDonald, continuing between Eumundi and Verrierdale to Yandina Creek to line up with Runway 13 arrivals.

#### **Consideration:**

This alternative approach was not within the concept flight path corridors contained in the approved EIS.

This proposal is feasible within the flight path design regulations, however to make it safe and operational it would require:

- introduction a change in level segment due to the need to ensure safety with the crossovers with departure tracks
- impact on the 'Smart Tracking' (RNP-AR) approaches effecting the Continuous Descent Approaches (CDA).

Aircraft would still overfly rural areas including Ringtail Creek, Forest Acres, Lake MacDonald and Cooroy Mountain, and remain over land longer than the proposed final design.

This approach has been noted for possible future feasibility consideration for international arrivals from the north to the Sunshine Coast, but would require environmental assessment and community consultation.

#### **Outcome:**

This alternative has not been incorporated in the proposed final design but may be assessed for safety and operational feasibility as part of ongoing flight path and airspace design reviews.

It has been included on our register of possible alternatives for further consideration.

### Southern approach over water, for limited runway operations

Some community submissions asked for all operations to land and depart onto the southern end of the runway only (Runway 31 for arrivals, Runway 13 for departures) using an over the water approach and departure track.

#### **Consideration:**

While this proposal would be contained within the EIS concept corridors, it does not enable safe operations in all weather conditions in and out of the airport.

This is because aircraft land and take off into the wind wherever possible. This reduces the risk of unstable approaches and high touchdown speeds on the runway.

At Sunshine Coast Airport, the prevailing wind is a sea-breeze. When the wind is like this, Runway 13 is used as the mode of operation, and has arriving aircraft landing from the north onto the runway and departing aircraft taking off to the south over water.

This proposal would not enable aircraft to land on Runway 13 or depart on Runway 31, when the weather conditions required.

#### **Outcome:**

This alternative has not been incorporated in the proposed final design.

### Direct southern approach over land with a right turn onto the Runway 13

Some community submissions asked for an alternate approach option for arrivals from the south, tracking north at altitude along the Maroochy River, to near Yandina descending over agricultural land and turning right onto Runway 13.

#### **Consideration:**

This alternative approach was not within the concept flight path corridors contained in the approved EIS.

This approach is outside of instrument procedures design regulations. It does not meet the minimum international or domestic standards, as the turns that aircraft would be required to do are too tight for both the STAR and the approach.

This does not incorporate PBN and enable reliance on satellite navigation over legacy ground based navigation systems.

To enable stable approaches and safe operations flight path designs must consider all aircraft types operating on the flight path, and meet the minimum speed, minimum radius of turn, maximum bank angle and minimum segment length criteria.

This proposal was not able to provide for safe operations.

#### **Outcome:**

This alternative has not been incorporated in the proposed final design.

### Arriving aircraft to Runway 13 – extended northern approach to RNAV via Cooloola National Park

Some community submissions asked for an alternate approach option to be much further north than the proposed design, over Cooloola National Park so as to avoid impact on highly populated residential areas of Noosa and surrounds.

Some community submissions noted that a longer approach may increase time, distance and cost, but would have less impact on residents under the flight path.

#### **Consideration:**

This alternative flight path was not within the concept flight path corridors contained in the approved EIS.

This proposal would include a longer STAR (approximately 15 NM) that would join the RNAV between Cooroy and Cooroibah, however it would require a re-design of the strategic separation between this arrival the Runway 13 SID to the north.

While safe, this proposal would have an increased environmental impact as it would require aircraft to fly significant additional track miles over land, thereby increasing fuel burn and emissions across this flight path segment.

It does not provide efficiency for aviation operators or the travelling public by increasing flying time.

This extended flight path segment would affect operators who are not able to fly the 'Smart Tracking' (RNP-AR) including medical flights such as Royal Flying Doctor Service and operators services regional airports.

#### **Outcome:**

This alternative has not been incorporated in the proposed final design.

### Departures for Runway 31 between Rainbow Beach and Teewah

Some community submissions asked for an alternate departure flight path between Rainbow Beach and Teewah.

This alternative flight path design called for deletion of the SID (orange flight path) for Runway 31 that tracks between Marcus Beach and Castaway Beach, and a proposal that all departures off Runway 31 to the south continue north for approximately 30 NM, and cross the coast between Teewah Beach and Rainbow Beach before turning south.

#### **Consideration:**

This alternative flight path was not within the concept flight path corridors contained in the approved EIS.

While safe, this proposal would have an increased environmental impact as it would require aircraft to fly significant additional track miles over land (approximately 30 NM), thereby increasing fuel burn and emissions across this flight path segment.

It does not provide efficiency for aviation operators or the travelling public, increasing flying time over a total increased flight segment of approximately 50 NM.

#### **Outcome:**

This alternative has not been incorporated in the proposed final design.

### Adjusted arrivals and departure flight paths further north west of Yandina Creek

Some community submissions asked for an alternate approach option for arrivals and departures from the north to be realigned further west and north of Yandina Creek.

#### **Consideration:**

This alternative flight path was not within the concept flight path corridors contained in the approved EIS.

This alternative does not meet operational or design constraints.

The procedure would require aircraft to fly an offset final approach. An offset final approach is permissible under ICAO and CASA regulations, however it is only applied when terrain or obstacles is a factor affecting a runway aligned approach procedure.

The final approach and its track guidance should be aligned with a runway whenever possible. An offset final approach increases the complexity of pilot operation. Consequently it should only be designed when siting or obstacle problems permit no other option. An offset final approach track cannot be established as a noise abatement measure.

#### **Outcome:**

This alternative has not been incorporated in the proposed final design.



### Approaches with no crossovers

Some community submissions asked for an alternate approach option that would see approaches and departures aligned to runway operations and only include coastal crossings near Mooloolaba to the south and Noosa North shore to the north.

When Runway 13 is in use, arrivals would track from the north and west and commence descent over state forest, and depart over the water, crossing the coast near Maroochydore.

Conversely when Runway 31 arriving aircraft would track over water and cross the coast near Maroochydore, while departing aircraft would track west until 5000 feet before turning north or south to their destination.

The alternative asserted that there would be no SID and STAR cross-overs.

#### **Consideration:**

This design element was not within the concept flight path corridors contained in the approved EIS.

The submission provided alternative approaches however these would need to connect with the overarching air traffic network via SIDs and STARs that would need to be procedurally designed for systemic separation for arriving and departing aircraft.

While the approaches do not have crossovers with departures, the SIDs and STARs would be required to have some cross over points.

The alternative presented is effectively the current design but rotated to have northern operations contained over communities to the north and west, rather than the northern coast areas.

The approach does not meet multiple design considerations including keeping aircraft over water and non-residential areas wherever possible.

East Coast operations utilise over the water designs wherever practicable for this reason and these are not included in the alternative for departing aircraft on Runway 31 or arriving aircraft to Runway 13

The approach would require additional controlled airspace to the west of Sunshine Coast Airport which would have a negative effect on general aviation activities in the region and does not meet with Airservices requirement to maintain equity of access for all airspace users.

#### **Outcome:**

This alternative has not been incorporated in the proposed final design.

## Section 5 Airspace Change Proposal

### Environmental Impact Assessment Version 2

We have developed a proposed final design that is shaped by community feedback, and have assessed this proposed final design for environmental impacts. The findings of this assessment, as reported in the TEIA Version 2, remain consistent with the findings of the approved EIS.

The TEIA Version 2 will be released on our website.

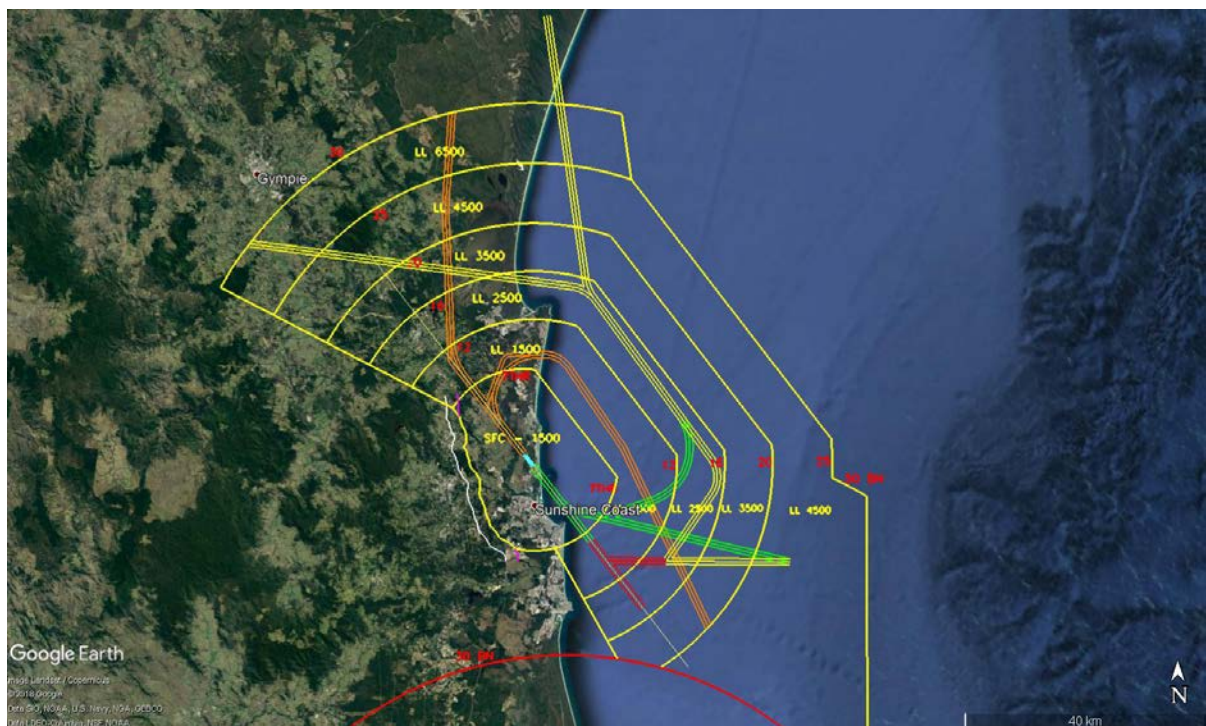
### Airspace Design Implementation

Proposed changes to the Australian airspace architecture are managed through the CASA airspace change process.

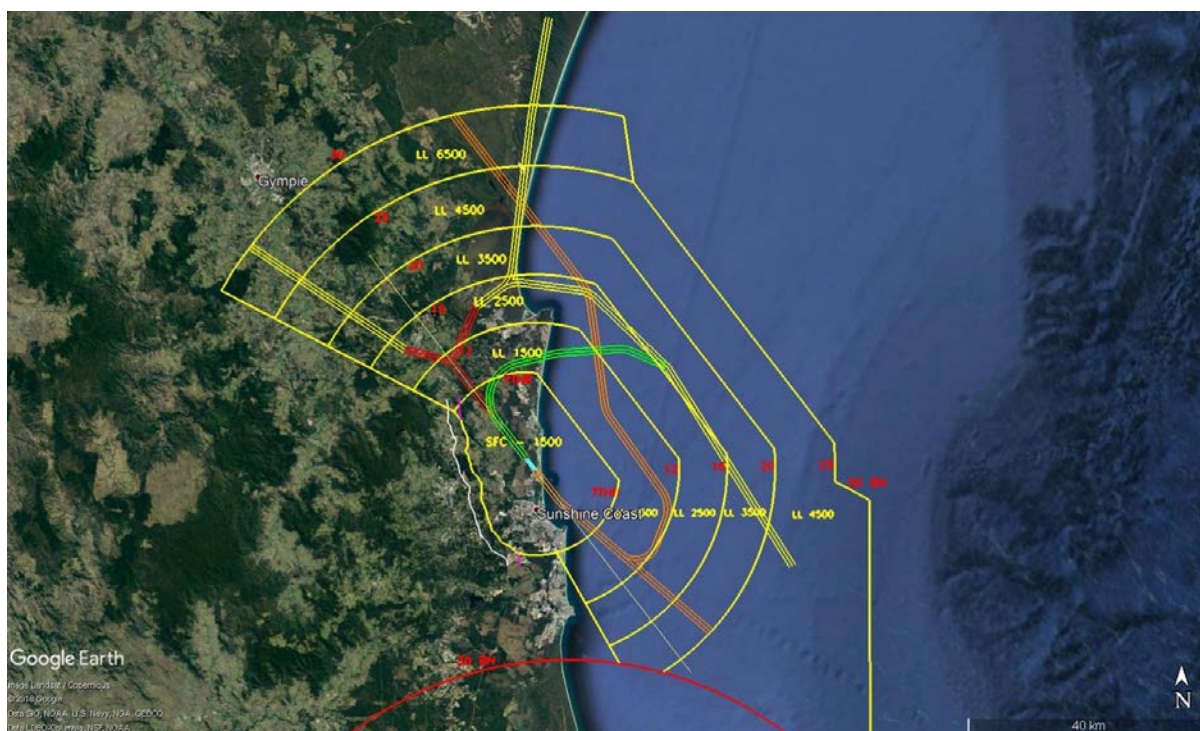
Generally CASA will review the airspace that is needed to contain flight paths in controlled airspace, the high level air routes, the type of air traffic control service to be provided, and the containment of instrument flight procedures.

Airservices must apply to CASA for an Airspace Change Proposal (ACP) when our proposed changes affect one or more of these elements.

Figures 17 and 18 present the airspace that Airservices will be proposing that CASA approve to ensure that operations for Runway 13 and Runway 31 are contained in controlled airspace.



**Figure 17: Airspace design and proposed final flight paths – Runway 31 operations**  
**Airspace Design (Yellow) overlayed on proposed final flight paths**



**Figure 18: Airspace design and proposed final flight paths – Runway 13 operations**  
**Airspace Design (Yellow) overlayed on proposed final flight paths**

CASA will review our proposal to ensure it meets ICAO Standards and Recommended Practices and incorporates international best practice that could benefit the Australian Airspace System, wherever practicable.

We are seeking to have the designs implemented in full by May 2020, subject to CASA approving the ACP.

## Glossary of Terms

<b>ACP</b>	Airspace Change Proposal
<b>AIP/ERSA</b>	Aeronautical Information Package/En Route Supplement Australia
<b>ATM</b>	Air Traffic Management
<b>BARO-VNAV</b>	<i>Barometric Vertical Navigation is an RNAV system which uses barometric altitude information from the aircraft's altimeter to compute vertical guidance for the pilot. The specified vertical path is typically computed between two waypoints or an angle from a single way point.</i>
<b>CASA</b>	Civil Aviation Safety Authority
<b>CASR</b>	Civil Aviation Safety Regulations
<b>CCO</b>	<i>Continuous Climb Operations (CCO) is an aircraft operating technique facilitated by the airspace and procedures design and assisted by appropriate air traffic control procedures, allowing the execution of a flight profile optimised to the performance of aircraft, leading to significant economy of fuel and environmental benefits in terms of noise and emissions reduction.</i>
<b>CDA</b>	<i>Continuous Descent Approaches (CDA) are subject to airspace design and use, and in ideal conditions, allows an aircraft to practically glide to an airport with engines at idle power. This results in lower noise levels compared to traditional approach paths that have intermediate altitudes where an aircraft will level off.</i>
<b>DoEE</b>	Department of Environment and Energy (Cth)
<b>EIS</b>	Environmental Impact Statement
<b>EPBC Act</b>	Environmental Protection and Biodiversity Conservation Act
<b>Flight Corridor</b>	A term commonly used to describe the area that will contain the possible operation of an aircraft on a particular flight track.
<b>Flight Path</b>	A single path depicting where an aircraft intends to fly.
<b>GA</b>	<i>General Aviation (GA) is a term used to describe the many small aircraft operating in Australia that are not generally used by airlines or large charter companies.</i>
<b>IAF</b>	Initial Approach Fix
<b>ICAO</b>	International Civil Aviation Organisation
<b>IFR</b>	<i>Instrument Flight Rules (IFR) are rules which allow properly equipped aircraft to be flown under instrument meteorological conditions (IMC).</i>
<b>MNES</b>	Matters of National Environmental Significance
<b>NAPs</b>	<i>Noise Abatement Procedures (NAPs) are procedures followed by air traffic controllers or pilots to reduce the effects of noise experienced on the ground. Noise abatement procedures are not applicable when safety or operational requirements mean that other procedures need to be followed.</i>
<b>NM</b>	Nautical mile
<b>PANS OPS</b>	<i>PANS-OPS is an air traffic control acronym which stands for <b>Pro</b>cedures for <b>Air Navigation Services</b> – Aircraft <b>OP</b>eration<b>S</b>. PANS-OPS are rules for designing instrument approach and departure procedures.</i>



<b>PBN</b>	<i>Performance Based Navigation (PBN) uses on-board equipment such as global navigation satellite systems receivers, stand-alone navigators, and integrated navigation systems. Under PBN, airspace and route design take into account the aircraft operations in the region, and the capability of aircraft flying in it.</i>
<b>RNAV</b>	<i>Area navigation (RNAV) is a method of navigation which permits the operation of an aircraft on any desired flight path; it allows its position to be continuously determined wherever it is rather than only along tracks between individual ground navigation aids.</i>
<b>RNP-AR</b>	Required Navigation Performance – Authorisation Required (also see Smart Tracking)
<b>RPT</b>	Regular Public Transport
<b>RWY</b>	Runway
<b>SCA</b>	Sunshine Coast Airport
<b>SCAEP</b>	Sunshine Coast Airport Expansion Project
<b>SCC</b>	Sunshine Coast Council
<b>SID</b>	<i>A Standard Instrument Departure Route (SID) is a standard ATS route identified in an instrument departure procedure by which aircraft should proceed from take-off phase to the en route phase.</i>
<b>Smart Tracking</b>	<p><i>It is a method of navigation that uses satellite-assisted guidance and provides on-board performance monitoring and alerting to the pilots to enable the aircraft to fly with greater accuracy and predictability than RNAV only approaches.</i></p> <p><i>A satellite assisted navigation system is used by a growing number of modern aircraft, and allows an aircraft to fly extremely accurately and also has the capacity for curved arrival paths. Known in aviation circles as Required Navigation Performance – Authorisation Required (RNP-AR).</i></p>
<b>STAR</b>	<i>A Standard Arrival Route (STAR) is a standard ATS route identified in an approach procedure by which aircraft should proceed from the en route phase to an initial approach fix.</i>
<b>TEIA</b>	Targeted Environmental Impact Assessment
<b>VFR</b>	<i>Visual Flight Rules (VFR) are the rules that govern the operation of aircraft in conditions in which flight solely by visual reference is possible.</i>
<b>Waypoint</b>	<p><i>A waypoint is a specified geographical location used to define an area navigation route or the flight path of an aircraft employing area navigation. Waypoints are identified as either:</i></p> <p><b><i>Fly-by waypoint.</i></b> <i>A waypoint which requires turn anticipation to allow tangential interception of the next segment of a route or procedure, or</i></p> <p><b><i>Flyover waypoint.</i></b> <i>A waypoint at which a turn is initiated in order to join the next segment of a route or procedure.</i></p>



