

GOLD COAST AIRPORT – SOUTHERN OPERATIONS NOISE IMPROVEMENT INVESTIGATION REPORT

Version 1.0

FINAL REPORT

CHANGE SUMMARY

Version	Date	Change Description
0.1	October 2021	Draft for comment
0.2	November 2021	Updated draft to include table of arrivals
0.3	November 2022	Updated draft for comment
1.0	31 March 2023	Final report

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1. PURPOSE

The purpose of this document is to summarise Airservices investigation into community-initiated proposals for changes for flight paths to and from the south of Gold Coast Airport ('Southern Operations').

2. BACKGROUND

In February 2020, Airservices undertook actions from the Gold Coast Airport Noise Abatement Consultative Committee (ANACC) to investigate:

- the management of departures from RWY 14 that overfly Kingscliff, specifically aircraft for destinations to the north and east of the Gold Coast that fly runway heading
- the use and application of the RNP-AR¹ approaches to RWY 32, to optimise over water operations.

To support the investigation, we commenced a review of current operations at Gold Coast Airport in March 2020.

On 24 June 2020, Airservices, Gold Coast Airport Limited (GCAPL), and some community members from the ANACC, met to discuss the community proposals for variation to the traffic management, to improve the noise outcomes for community members in the Kingscliff and Fingal Head areas.

We undertook to investigate these proposals to assess their feasibility and safe application, but also identify any potential conflicts or environmental impacts (e.g., track miles, emissions, and community overflight).

On 15 October 2020, Airservices presented an interim update on the progress of the investigation to the Gold Coast ANACC. During this meeting, an additional proposal that was previously raised at the February 2019 ANACC meeting was discussed and clarified as an action:

- the feasibility of an offset RNP² approach over water to RWY 32.

We undertook to include this additional proposal in this investigation.

On 4 November 2020, we provided an update on the progress of the investigation to the Gold Airport Community Aviation Consultative Group (CACG) as part of the Airservices standing presentation. This meeting was attended by Airservices representatives virtually.

On 10 November 2020, we met with some of the proponents of the proposals to discuss the initial findings of our analysis. This meeting was attended by Airservices representatives virtually.

We presented the outcomes of the completed analysis at the ANACC meeting on 11 February 2021, advising that:

- **Proposal 1** - adjust the RWY 14 SID and STAR would not progress for further assessment due to the increased track miles and emissions. Additionally, the increase in climb gradient required by departing aircraft may result in increased noise levels for the communities overflowed due to thrust setting
- **Proposal 2** - to adjust the RWY14 departure to H095 still placed departing aircraft in conflict

¹ A *Required Navigation Performance - Authorisation Required (RNP-AR)* approach procedure requires aircraft to operate in accordance with strict navigation parameters and follow precise flight paths to an airport. To fly an RNP-AR approach, aircraft must be suitably equipped, and pilots must be specially trained. Additionally, in Australia the operator must have the approval (authorisation) of the Civil Aviation Safety Authority (CASA).

² Area Navigation (RNAV) Global Navigation Satellite System (GNSS) approaches use GNSS to allow flight via geographic coordinates without the need for ground-based navigation aids.

with RWY 14 arrivals however further assessment was required

- **Proposal 3** - to increase use of the RWY 32 RNP-AR would be progressed for further assessment
- **Proposal 4** - to design a RWY 32 RNP off-set over water would progress for further assessment.

Airservices then completed a further review of Proposals 2, 3 and 4, advising that:

- **Proposal 2** - to adjust the RWY14 departure to H095 was further assessed by the Operations team and was found to not be operationally feasible as it placed departures in conflict with arrivals. Further detail is provided in Section 5.
- **Proposal 3** - to increase use of the RWY32 RNP-AR will be progressed to design.
- **Proposal 4** - to design a RWY 32 RNP off-set over water will be progressed to design.

On 13 October 2021, Airservices provided the ANACC chair a draft Gold Coast Airport - Southern Operations Review Report for distribution to the ANACC group for feedback.

On 3 November 2021, Airservices provided the ANACC chair an updated draft Gold Coast Airport - Southern Operations Review Report for distribution to the ANACC, which included incorporation of feedback received from the community. It was requested that this updated draft was distributed to the ANACC group for feedback.

On 24 March 2022, Airservices presented to the CACG group, noting that the Gold Coast Airport - Southern Operations Review Report had now been finalised.

On 7 April 2022, Airservices received a request for information document request from the Aircraft Noise Ombudsman.

On 23 June 2022, Airservices presented to the ANACC group, providing an update on the progress of Proposal 3 and Proposal 4. It was noted that the final report would be updated and published.

On 11 August 2022, Airservices met with community members interested in the Gold Coast Airport - Southern Operations Review Report to provide an opportunity to explain Airservices reasoning for assessment outcomes and to also take further feedback from the group. Airservices agreed to review the proposals outlined in the final report and where a proposal is not possible, provide clearer reasoning for the decision. Noting that each proposal will receive a dedicated slide at the next ANACC.

On 20 October 2022, Airservices presented to the ANACC group, providing a dedicated slide for each proposal.

On 24 November 2022, Airservices met with the with community members interested in the Gold Coast Airport - Southern Operations Review Report. Ahead of this meeting we provided an updated draft report to the group.

3. PROPOSALS

The following community-initiated noise improvement proposals were investigated:

1. **Push the RWY 14 arrival flight paths from the south further out to sea**, to improve the area of conflict between arriving aircraft to RWY 14 and departing aircraft off RWY 14 that are heading north or east.
2. **Adjust the RWY 14 standard departure heading to H095 for aircraft departing to the north or east**, to reduce the time in conflict between arriving aircraft to RWY 14 and departing aircraft off RWY 14 that are heading north or east
3. **Increase the management of international flights to RWY 32 via the over water (offset) RNP-AR approach**
4. **Design an over water (offset) RNP approach to RWY 32.**

To assist in the assessment of these proposals, we first reviewed the current operations at Gold Coast Airport.

4. CURRENT OPERATIONS

4.1. Airport Description

[Gold Coast Airport](#) is located at the southern end of the Gold Coast region and the northern area of the Tweed Region, just west of the Gold Coast Highway adjacent to Bilinga Beach. To the west are the McPherson Ranges and immediately to the east is the Pacific Ocean.

The majority of operations at Gold Coast Airport have historically been international and domestic scheduled passenger operations, however this has varied markedly as a result of the COVID-19 pandemic impacts on aviation operations.

General Aviation (GA) also operates from the airport, including both fixed wing and helicopter training, and scenic flights. There are a number of flying training schools based at Gold Coast Airport, and they undertake both circuit training and instrument flight training.

Although Gold Coast Airport is operational 24 hours of the day, there is a curfew in place which restricts operations in and out of the airport during the hours of 11pm to 6am the following day. Detailed information about the curfew is available from the [Department of Infrastructure, Transport, Regional Development and Communications](#).

4.1.1. Runways

Gold Coast Airport has two runways; the main runway, Runway 14/32 (2.3 km long) is orientated in the northwest – southeast direction, and the smaller cross runway, Runway 17/35 (0.6km) is orientated north-south.



Figure 1: Satellite image of Gold Coast Airport runways. Source: Airservices Aircraft in Your Neighbourhood, October 2020

Runway selection for use is made based on a range of factors including wind direction, weather conditions, traffic volume and other factors. Aircraft primarily take-off and land into the wind for safety and performance reasons. Therefore, as the wind direction changes the runway in operation may also change.

This means that Gold Coast's seasonal wind patterns affect usage of the different runway directions.

Throughout most of the year, the wind at Gold Coast Airport tends to be from the south-to-south-east which means greater use of Runway 14 with aircraft departing to the south and arriving from the north. During the spring months, the wind tends to be from the north, which means greater use of Runway 32 with aircraft departing to the north and arriving from the south.

4.2. Airspace

4.2.1. Gold Coast controlled airspace

Gold Coast Tower and Gold Coast Approach³ controlled airspace is shown in **Figure 3** below.

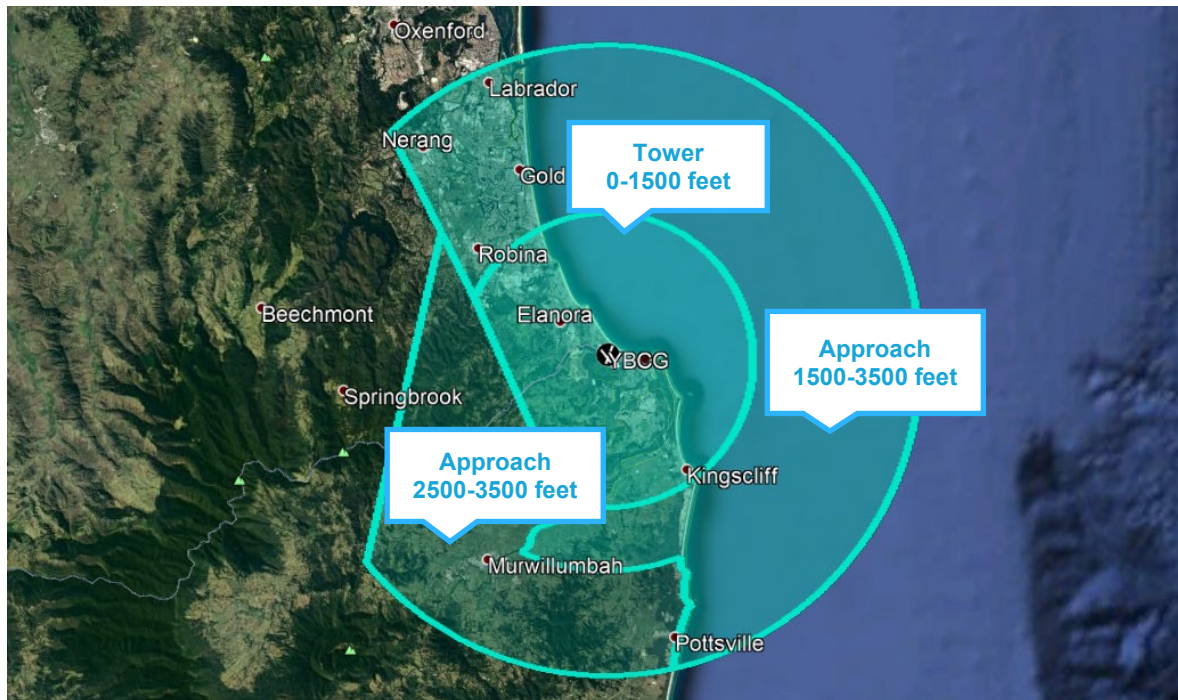


Figure 2: Gold Coast Airport controlled airspace.

Gold Coast controlled airspace is contained within the controlled airspace for Brisbane International Airport (YBBN) operations, as shown in **Figure 3**.

³ Gold Coast Approach air traffic control (ATC) service is performed by the Brisbane Terminal Control Unit (TCU).

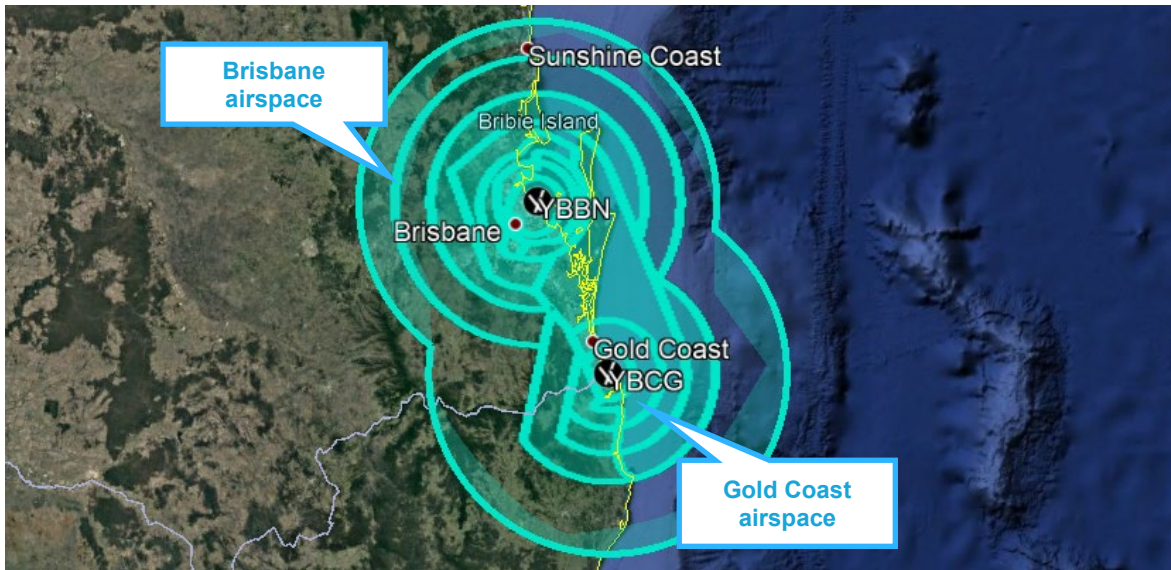


Figure 3: Gold Coast controlled airspace shown within Brisbane controlled airspace.

4.2.2. Military Restricted Areas

Several military Restricted Areas exist within the southeast Queensland region, mostly associated with operations at/from Royal Australian Air Force (RAAF) Base Amberley, located to the southwest of Brisbane, thereby restricting available airspace.

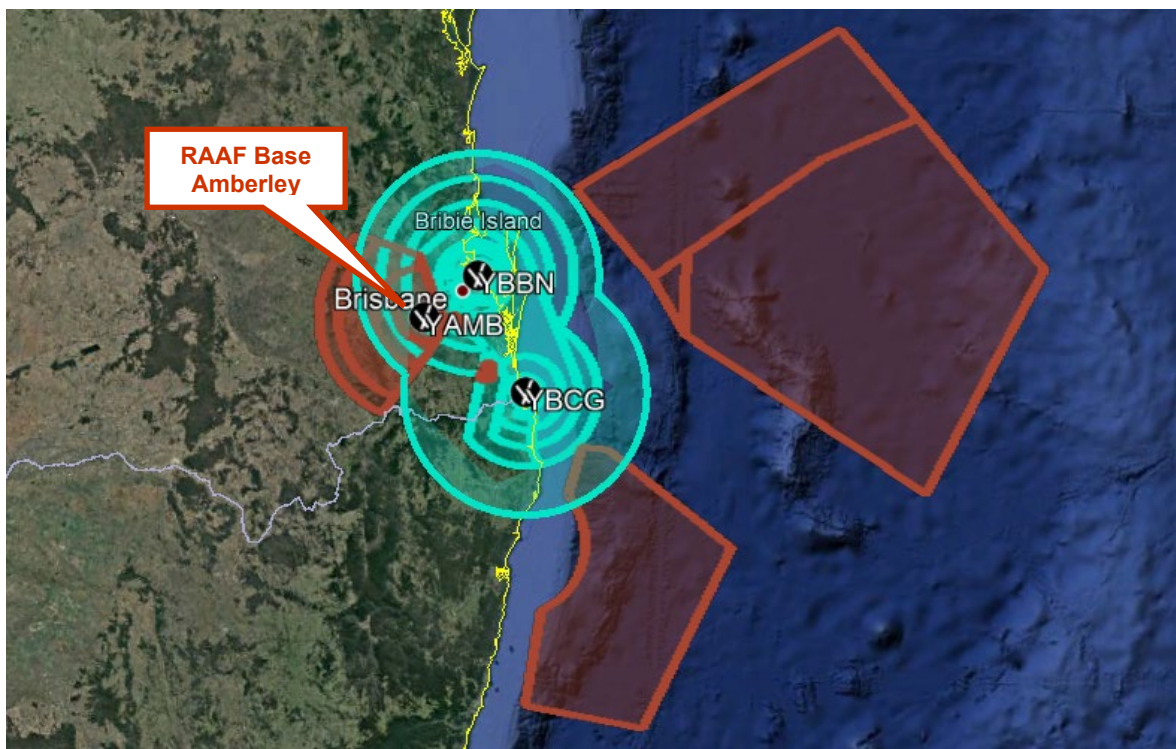


Figure 4: Military Restricted Areas in the southeast Queensland region

4.3. Noise abatement procedures (NAP)

Noise Abatement Procedures (NAPs) are designed to minimise the impact of aircraft noise on the community.

Airservices has several NAPs at Gold Coast Airport for aircraft operating under Instrument Flight Rules (IFR). These include instructions for the management of preferred runways and flight paths for operations, defined noise sensitive areas, jet departures, emergencies, and curfew dispensations.

Figure 5 and Figure 6 below are snippets from the Gold Coast Airport NAPs. These snippets outline:

- the preferred runways
- preferred flight paths for arriving aircraft
- preferred flight paths for departing aircraft

To view the full NAPs for Gold Coast airport, please visit the Aeronautical Information Package (AIP) [here](#), by agreeing to the *Copyright Notice*, selecting the current *Departure and Approach Procedures (DAP)*, selecting *Aerodrome & Procedure Charts*, and searching for Gold Coast (YBCG).

23 MAY 2019 NOISE ABATEMENT PROCEDURES PAGE 1
GOLD COAST, QLD

NOISE ABATEMENT PROCEDURES GOLD COAST

1. - PREFERRED RUNWAYS (ALL HOURS)

1.1 **Landing** - Runway 14

1.2 **Take-off** - Runway 14 - Jet Noise Abatement climb procedures apply.

1.3 Applicable to all aircraft.

2. - INTERSECTION DEPARTURES

2.1 Restrictions apply to intersection departures:

(a) Aircraft are to use TWY Kilo intersection departure for RWY 32 (2342 M).
Full length departure RWY 32 available if operationally required.

(b) TWY intersection departures other than Kilo may only be authorised by Tower to enhance traffic management.

(c) Outside TWR hours of duty, all aircraft must use the full length RWY 14, or RWY 32 TWY Kilo intersection departure for all departures.

3. - PREFERRED FLIGHT PATHS (during BRISBANE Approach hours of duty).

3.1 **Arriving aircraft.**

Maximum use of over water tracking will be utilised until aircraft are established on their final approach course. Figure 1 indicates noise sensitive areas. Pilots should either avoid these areas where possible, or minimise aircraft noise whilst overflying them.
To assist with noise reduction on final approach, pilots of jet aircraft are requested to delay flap deployment until as late as is operationally practicable.

Figure 5: Gold Coast Airport Noise Abatement Procedures (Page 1). Source: Airservices Departure and Approach Procedures (DAP)

3.2 DEPARTING AIRCRAFT

3.2.1 JETS - Jet noise abatement climb procedures (See AIP ENR 1.5 para 9.1.6 & 9.1.7) apply to Runway 14 and Runway 32. Pilots can expect to follow SID Radar procedures.

(a) DEPARTING RWY 32*

- To the NORTH - expect a RIGHT turn to become established over water.
- To the EAST - expect a RIGHT turn to become established over water.
- To the SOUTH or SOUTHWEST - expect a RIGHT turn to become established over water until south of Kingscliff (CG130/7NM) and above 5000FT.

(b) DEPARTING RWY 14

- To the NORTH - expect a LEFT turn to become established over water.
- To the EAST or SOUTHEAST - expect a LEFT turn to become established over water.
- To the SOUTH or SOUTHWEST - expect a minor RIGHT turn until passing 5 DME

Figure 6: Gold Coast Airport Noise Abatement Procedures (Page 4). Source: Airservices Departure and Approach Procedures (DAP)

4.4. Application of Noise abatement procedures (NAP)

NAPs for use at the Gold Coast are applied by ATC in reference to an internal Letter of Agreement (LOA) “Gold Coast ATC tower and Brisbane Terminal Control Unit coordination and operating procedures”. **Figure 7** is a snippet from the Airservices Gold Coast ATC tower and Brisbane Terminal Control Unit coordination and operating procedures outlining the management of departures from Runway 14.

Runway	Direction	Jet departures (options in preferred order)
14 D	North 320 – 120 (clockwise)	<ol style="list-style-type: none"> 1. Turn left heading 070 until at least 2 NM over water; or 2. Runway heading 140 until established over water.
	SE 121 – 140 (clockwise)	<ol style="list-style-type: none"> 1. Turn left heading 070 until at least 2 NM over water; or 2. Runway heading 140 until established over water.
	South and West	Turn right heading 150 until 5 DME, then turn right onto track.

Figure 7: Gold Coast Airport Noise Abatement Procedures. Source: Airservices Brisbane TCU and Gold Coast Tower Coordination and Standard Operating Procedures

4.5. Traffic Flows

Airservices *Aircraft in Your Neighbourhood* Gold Coast Airport portal shows the typical operation and density of Gold Coast Airport traffic flows.

Figure 8 shows the typical traffic flows to RWY 14.

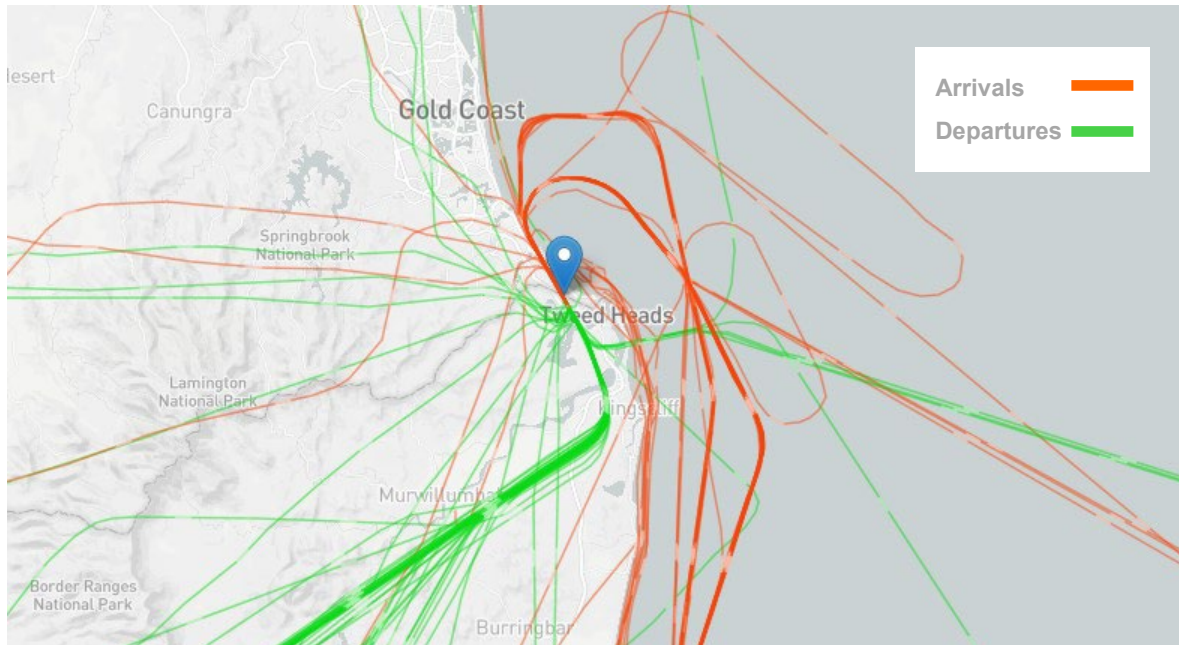


Figure 8: RWY 14 typical traffic flow. Source: Airservices Aircraft in Your Neighbourhood, October 2020

Figure 9 shows the typical traffic flows to RWY 32.

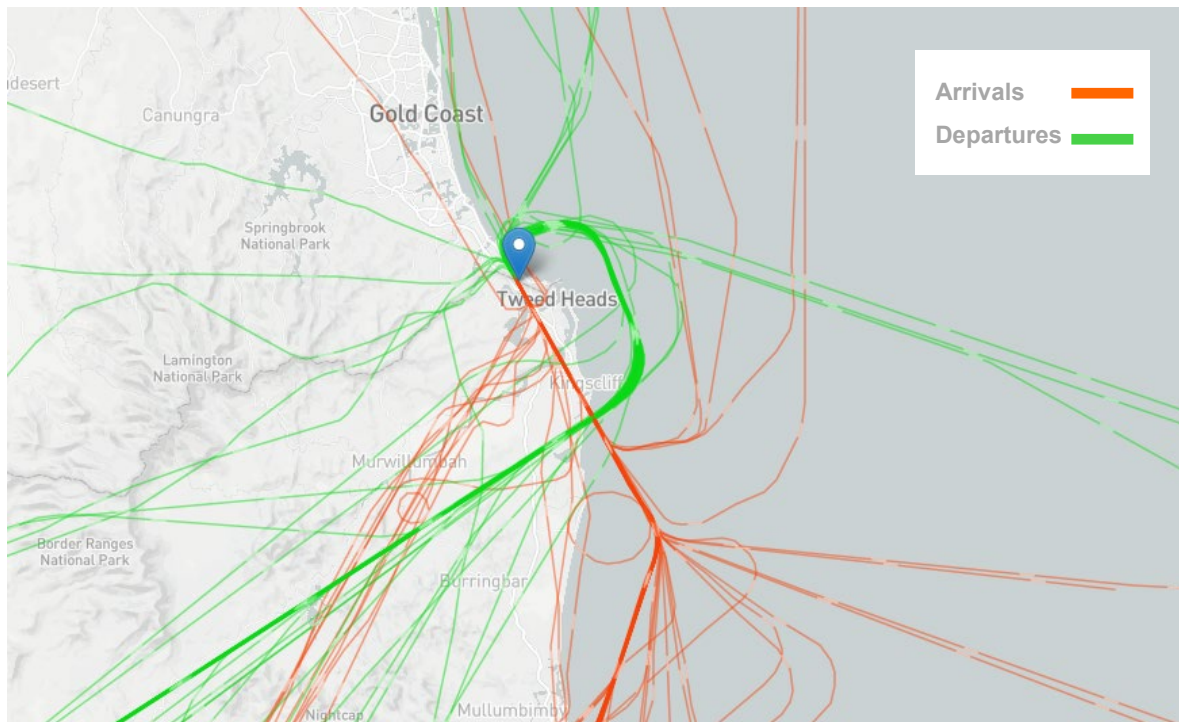


Figure 9: RWY 32 typical traffic flow. Source: Airservices Aircraft in Your Neighbourhood, October 2020

4.6. Southern Operations

4.6.1. RWY 14 arrivals

There are two arrival paths to RWY 14 from the south and southeast, which include:

- BERNI Arrival (traffic from Sydney, Melbourne, and Adelaide), which terminates for a Visual Approach, an RNP-AR approach, an RNP-Z approach, or ATC vectors for the ILS approach
- LAMSI Arrival (traffic from New Zealand), which terminates for an RNP-AR⁴ approach, an RNP-Z approach or ATC vectors for the ILS approach

Section 4.3 describes the application of Noise Abatement Procedures regarding use of these arrivals.

The RNP-AR approach is the preferred approach, as it provides lateral and vertical guidance, with reduced track miles, fuel burn and emissions.

Aircraft that are not equipped and approved to fly the RNP-AR will track via the RNP-Z or Visual approach.

Occasionally aircraft may be required to fly the ILS approach, in line with NAP requirements.

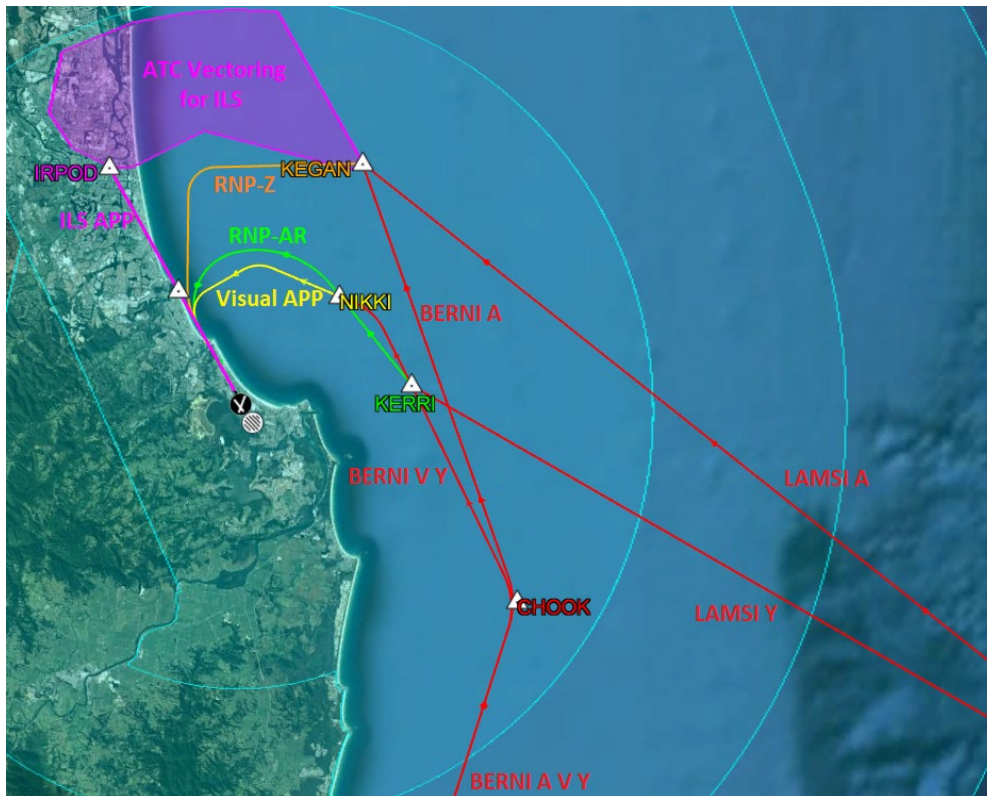


Figure 10: RWY 14 Arrivals (BERNI and LAMSI) and Approaches (RNP-AR, Visual, RNP-Z and ILS)
Source: Airservices AIP Departure and Approach Procedures (DAP)

⁴ Required Navigation Performance Authorization Required (RNP-AR) procedures are flight paths with strict navigation performance requirements that rely on satellite-based navigation and are only available to Civil Aviation Safety Authority (CASA) approved aircraft and pilots

The arrival flight paths to the Gold Coast RWY 14 from the south have been designed to:

- a. utilise the airspace over water, minimising the environmental and social impact of aircraft operations over land
- b. avoid the airspace to the west of the Gold Coast, used by Brisbane Airport arrivals and departures
- c. minimise the number of track miles required to be flown to the runway, thereby reducing fuel burn and CO₂ emissions.

See DAP charts at **Appendix A.1**.

4.6.2. RWY 14 departures

Departures from RWY 14 to the north and east are managed by Airservices Air Traffic Control (ATC) using the Standard Instrument Departure (SID), GOLD COAST SIX DEPARTURE (RADAR) (see DAP chart at **Appendix A.2**). On a radar SID, at the specified altitude (600ft for RWY 14), aircraft will onto an ATC assigned heading, which is determined by several factors, particularly separation.

In accordance with Gold Coast Airport NAP, whenever it is safe to do so, departures to the north and east are issued a left turn to become established over water, as outlined in **Figure 6 and shown in Figure 11**. *Gold Coast ATC tower and Brisbane Terminal Control Unit Coordination and Operating Procedures* states that the controller shall assign a left turn on H070 until at least 2NM over water.

The controller may instead issue H140 (runway heading) when H070 is considered unsuitable, particularly when there are potentially conflicting aircraft on the BERNI or LAMSI Arrival(s).

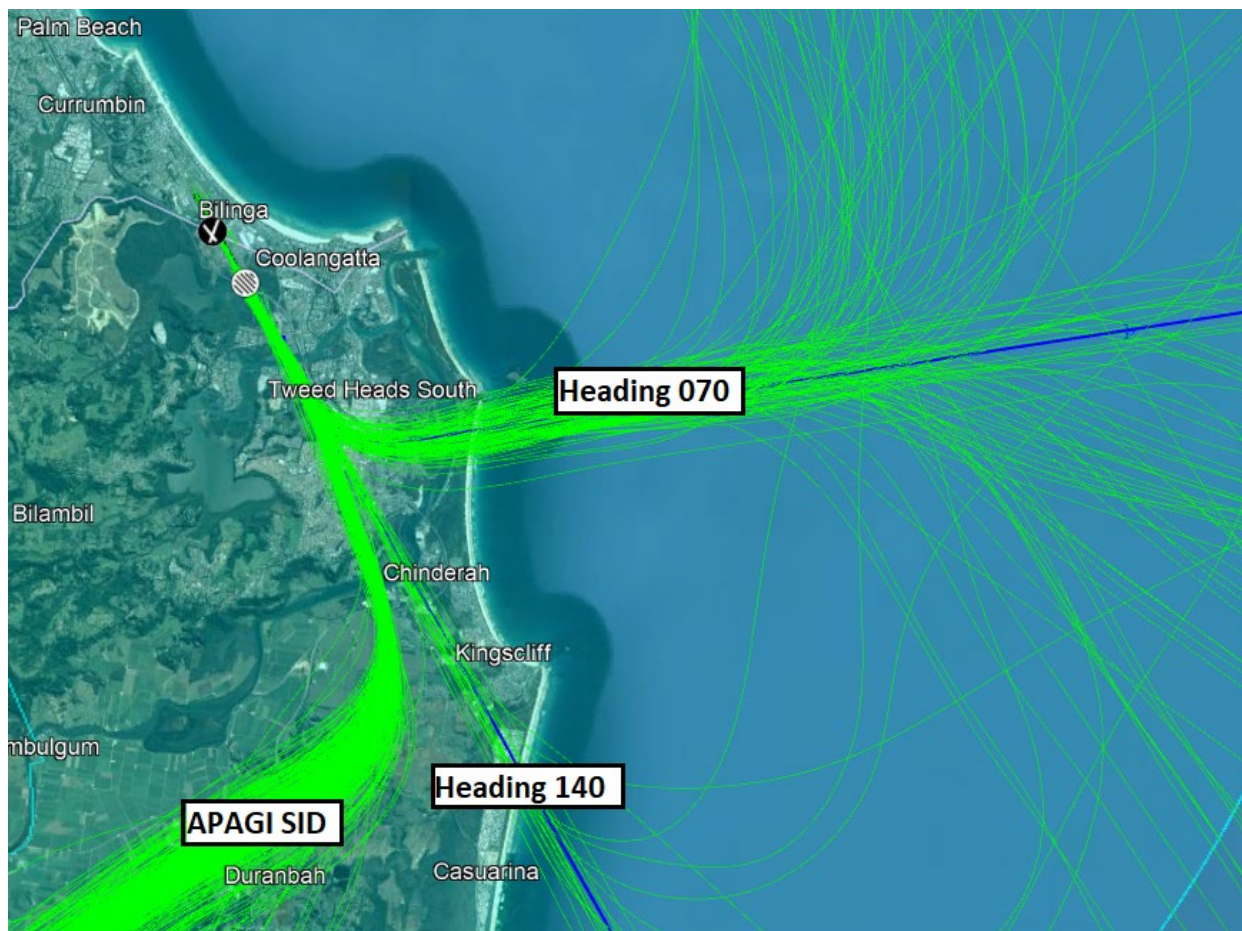


Figure 11: Actual RWY 14 departure tracks (green) with highlighting of the H070 and H140 flight paths (1-31 August 2019). Source: Airservices ANOMS

To determine a departure heading for an aircraft, air traffic control (ATC) must consider the potential for two or more aircraft to come in conflict based on predicted flight paths. ATC separation standards⁵ (lateral, vertical or a combination of both) must be applied to resolve any potential conflict. In the scenario in **Figure 12** below, the use of runway heading (H140) keeps the departing aircraft laterally clear of the area of conflict, because a vertical separation standard cannot safely be achieved prior to the lateral standard being lost. There is no guarantee the departure can ‘outclimb’ the arrival and the departure cannot go under the arrival due to the Minimum Safe Altitude (MSA) of 3000ft.

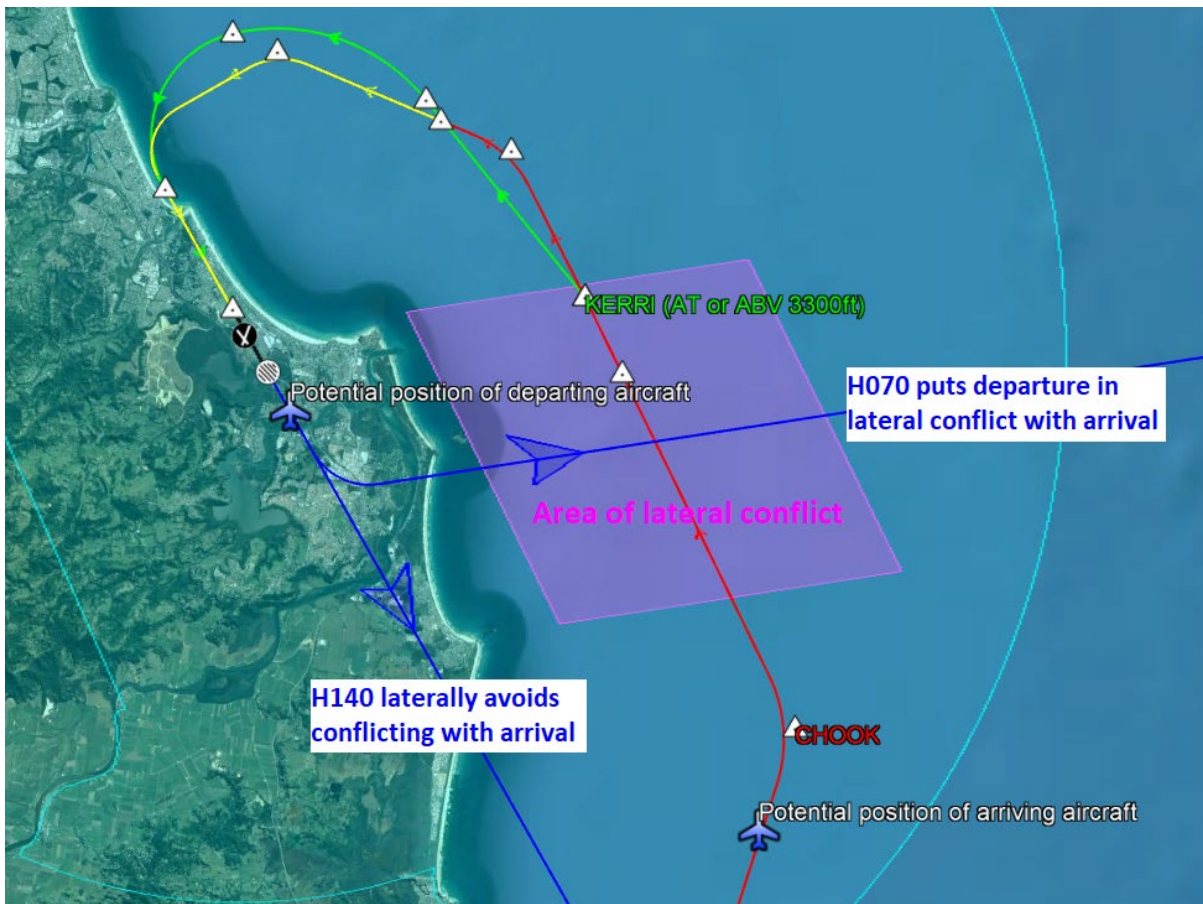


Figure 12: Diagram of the RWY 14 arrival from south vs departure north/east ‘Area of Conflict’.

In the example shown in **Figure 13** below, the departing Jetstar aircraft was assigned runway heading, due to the arriving Tiger aircraft.

⁵ In Approach radar airspace, the required lateral separation standard is 3 nautical miles (5.556 km) and vertical separation standard of 1000 feet (304.8m)



**Figure 13: Conflict between Jetstar (JST) Flight 131 departing for Auckland and Tiger (TGG) Flight 604 arriving from Sydney, requiring JST131 to depart Gold Coast on runway heading (4 December 2019).
Source: Airservices WebTrak**

4.6.3. RWY 32 arrivals via the RNP-AR approaches

As shown in **Figure 14**, there are two RNP-AR approaches to Gold Coast RWY 32:

- The straight-in west of Kingscliff is designed for use by aircraft from the south and east.
- The offset (overwater) east of Kingscliff is designed for use by aircraft from the north and east. It was first implemented in 2016 and updated in March 2019 to move it further over water. It is only used by a limited number of approved aircraft arriving from the north (e.g., Cairns). Some Asian operators from the north are not approved to fly it, and it is not yet used by aircraft from the east (e.g., New Zealand).

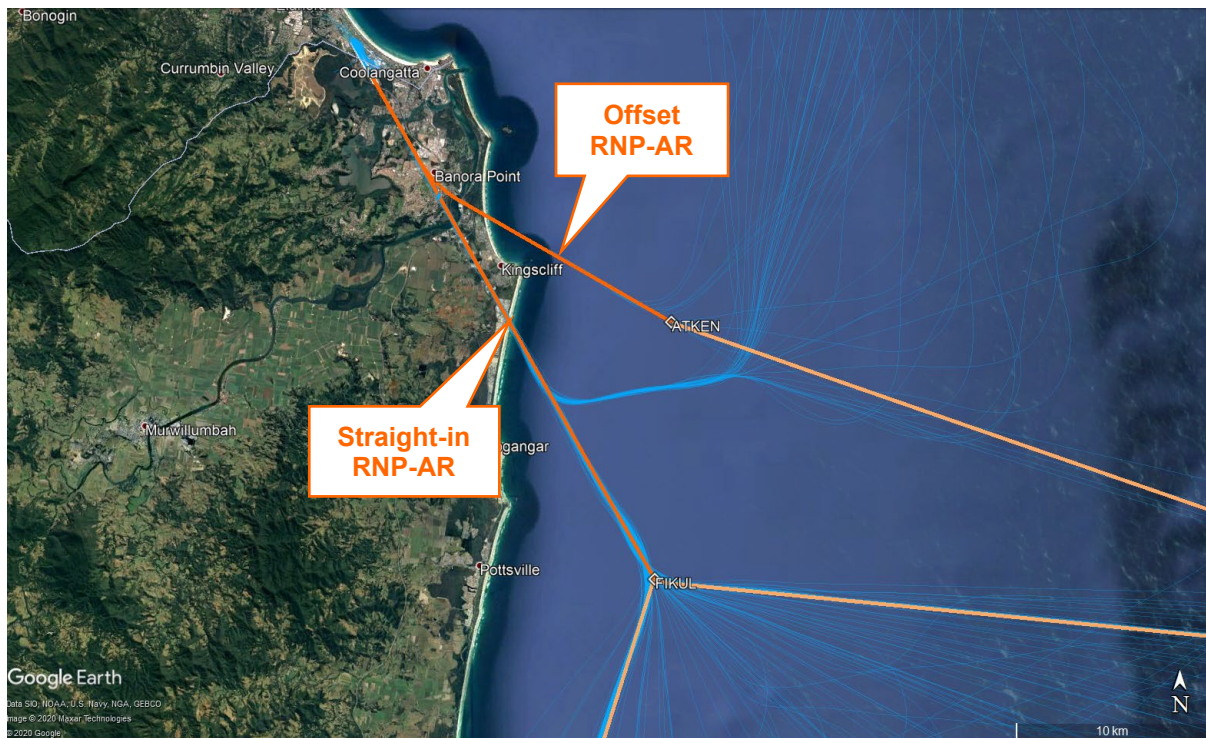


Figure 14: Actual RWY 32 arrival tracks (1-31 August 2019) with an overlay of the straight-in and offset RNP-AR arrival paths. Source: Airservices ANOMS

See *DAP* charts at **Appendix A.3**.

Aircraft that are not approved for the RNP-AR approaches will typically fly the RNP approach.

4.6.4. RWY 32 arrivals via the RNP approach

There is only one RNP (RNAV) approach to Gold Coast RWY 32, and it follows the same runway aligned path over land as the straight in RNP-AR approach (see *DAP* chart at **Appendix A.4**).

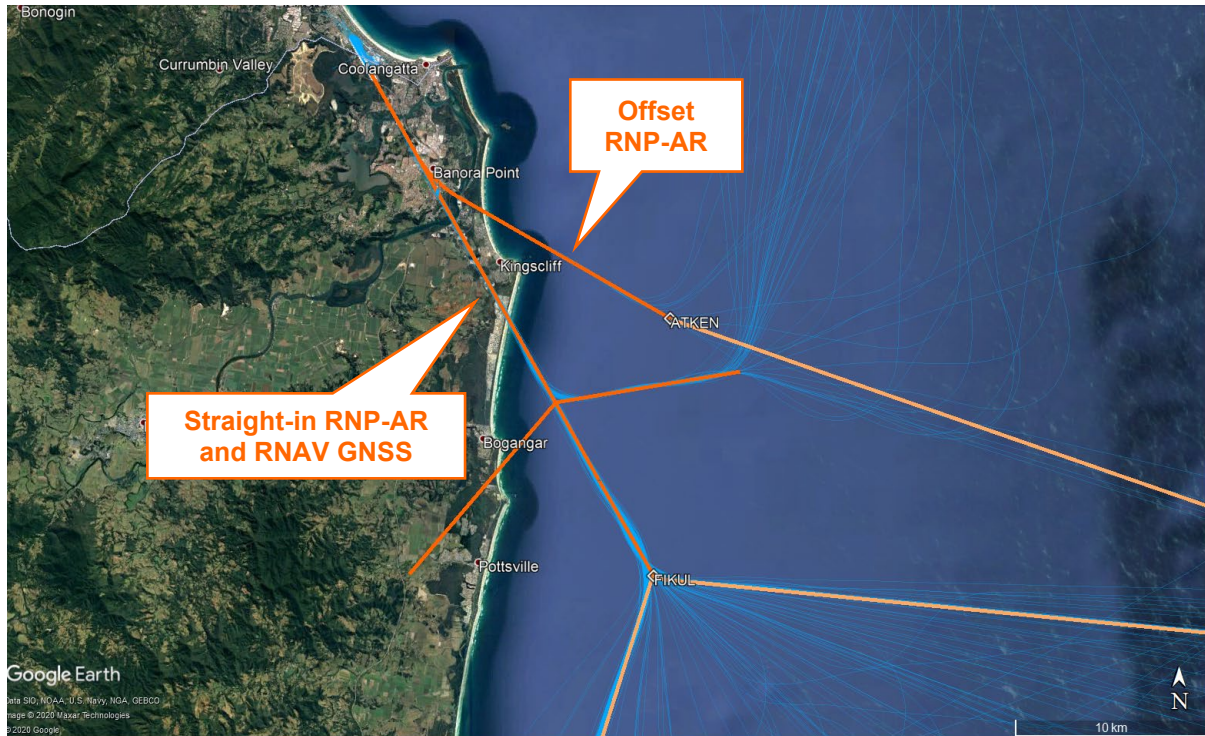


Figure 15: Actual RWY 32 arrival tracks (1-31 August 2019) with an overlay of the RNAV-Z GNSS approach and the RNP-AR approaches. The straight in RNP-AR cannot be seen as it is the same track as the RNAV GNSS. Source: Airservices ANOMS

5. INVESTIGATION

Proposal 1: Push the RWY 14 arrival flight paths from the south further out to sea

The proposal is to push the RWY 14 arrival flight paths further out to sea, which would consequently move the area of conflict between arriving aircraft and departing aircraft that could use H070/H095 (as per the current NAP & LOA / proposal 2), so that the departures would not have to overfly Kingscliff on runway heading (H140).

We investigated the feasibility of pushing the arrival path further out to sea for this proposal, by preparing a concept track (red) as shown in below in **Figure 16** and **Figure 17**.

Based on this concept design, there are two options for the arrival:

(1) Departure to go OVER the arrival:

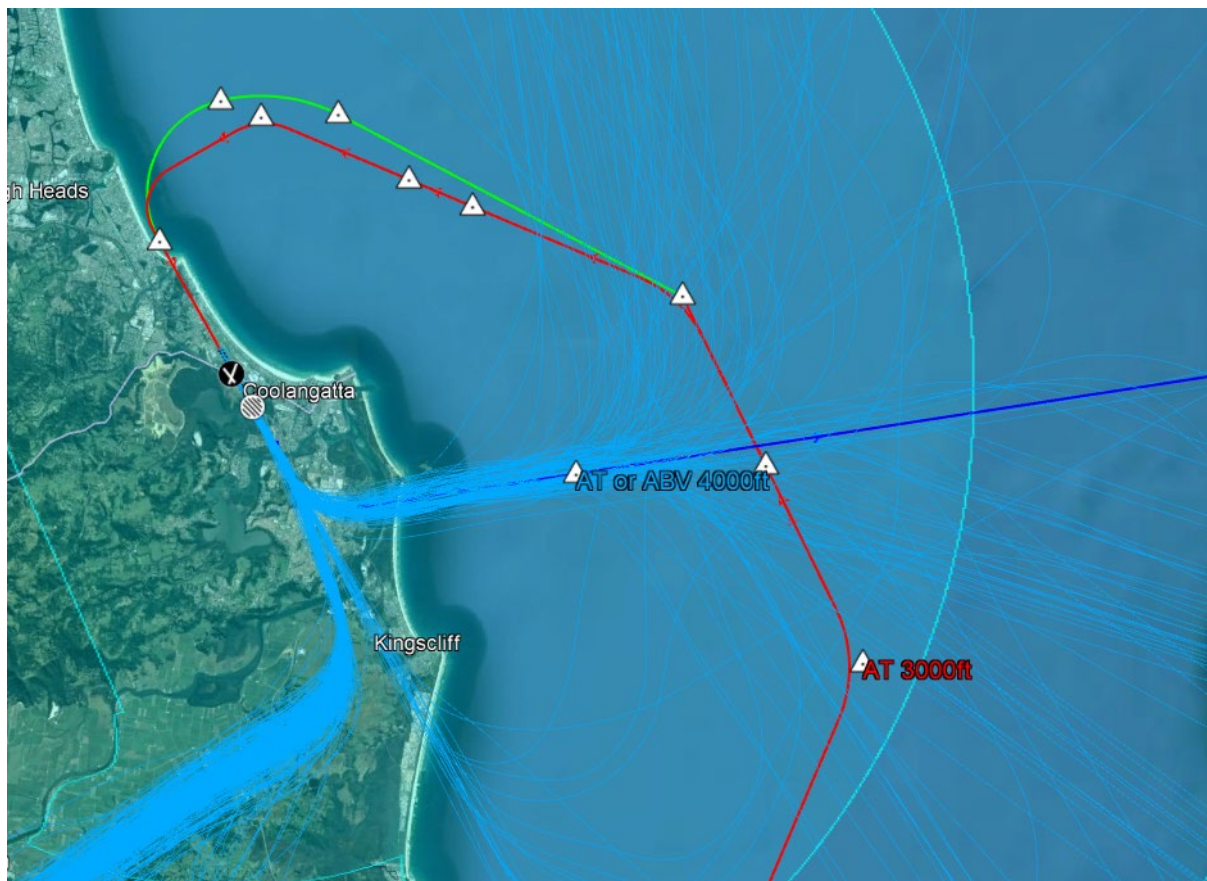


Figure 16: Proposed Arrival routes (BERNI V & Y STAR) versus H070 departure – Departure above arrival.

In this situation:

- The arrival must remain at or below 3000 feet until at least 3 nautical miles prior to crossing the departure flight track.
 - An aircraft held down to 3000 feet with 25 nautical miles to track prior to landing is unsafe and unacceptable for many jet aircraft.
- The RNP-AR could commence at 3000 feet, although this is not ideal.

- Departures have ~15 nautical miles to become established 1000 feet above the aircraft on the arrival flight track.
 - Reaching 5000 feet by this point is too steep (departure gradient above 10%)
 - Reaching 3000 feet by this point is too low, as this would push the arrival down to 2000 feet, below the minimum safe altitude
 - Therefore, the departing aircraft must reach 4000 feet by this point (departure gradient ~8.5%, this is still a steep departure and many long-haul departures may advise that they cannot meet this gradient).
- The increase in climb gradient required by departing aircraft may result in increased noise levels for the communities overflowed due to the required thrust setting.

(2) Arrival to go OVER the departure:

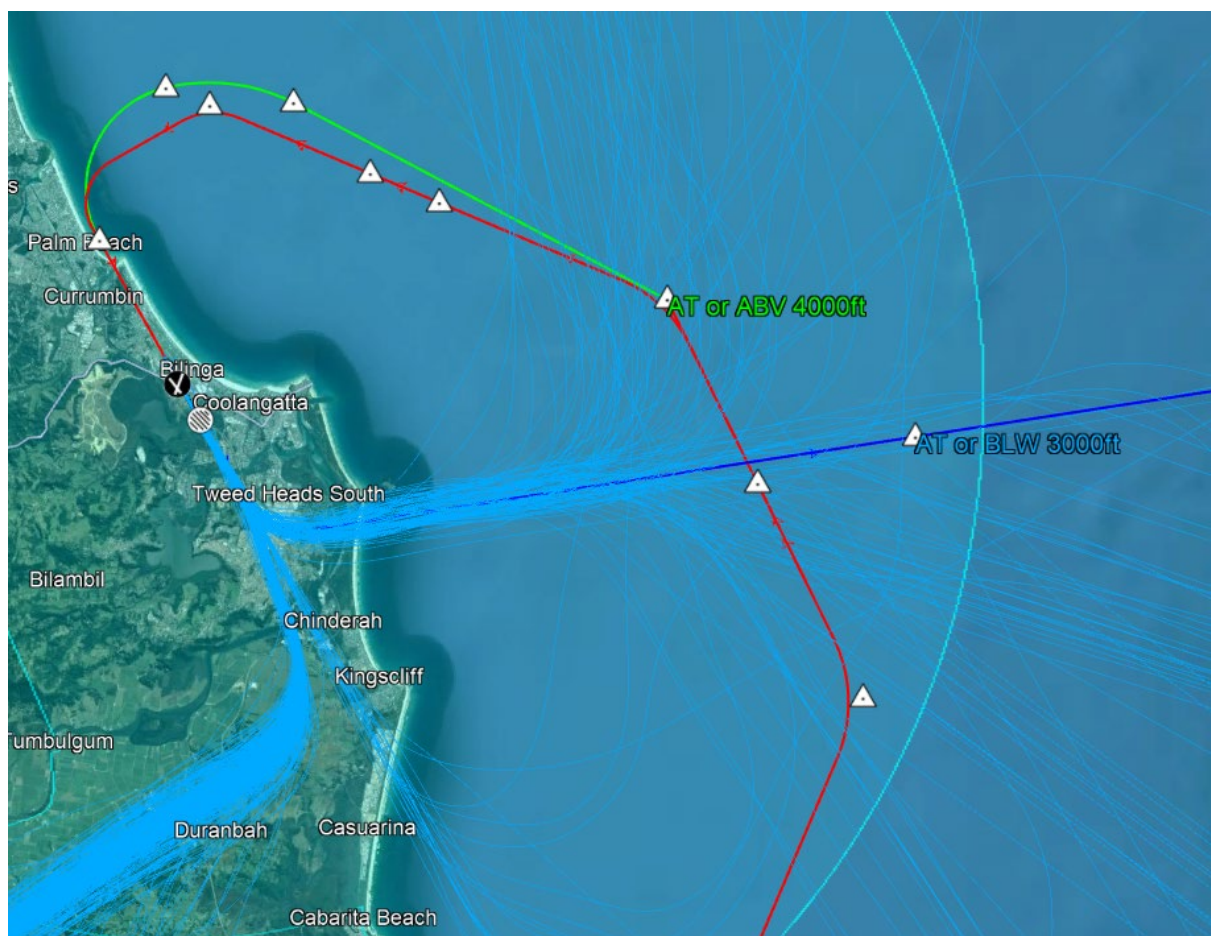


Figure 17: Proposed Arrival routes (BERNI V & Y STAR) versus H070 departure – Arrival above departure.

In this situation:

- The departure must remain at or below 3000 feet until at least 3 nautical miles past the arrival flight track
 - An aircraft held down to 3000 feet for ~15 nautical miles on departure is unsafe and unacceptable for many jet aircraft.
 - This risks the departing aircraft exiting controlled airspace

- The arrival must remain at or above 4000 feet until at least 3 nautical miles after crossing the departure (H070) flight track.
- The RNP-AR could commence at 4000 feet, as the commencement point is further out.

To further assist with our investigation, we gathered some data on the usage of RWY 14 for departures, including the usage of H140 (see **Table 1**).

For the month of August 2019, there were **865 jet arrivals** to RWY 14 and **901 jet departures** from RWY 14.

Date	RWY 14 Jet Departures (All destinations)	RWY 14 Jet Departures (All N/E destinations)	RWY 14 Jet Departures H140 (N/E destinations)	% of RWY 14 Jet Departures for N/E destinations H140, compared to all jet N/E jet departures
Jan-19	846	149	37	25%
Feb-19	1270	209	51	24%
Mar-19	1053	171	40	23%
Apr-19	1603	258	66	26%
May-19	1232	181	28	15%
Jun-19	1484	233	46	20%
Jul-19	1282	218	49	22%
Aug-19	901	141	26	18%
Sep-19	895	145	25	17%
Oct-19	1006	151	38	25%
Nov-19	525	82	22	25%
Dec-19	1056	174	41	24%
Jan-20	537	90	17	19%
Feb-20	1092	171	46	27%

Table 1: Monthly RWY 14 and H140 usage data from January 2019 to February 2020 (pre COVID-19). Source: Airservices ANOMS

It is important to note that on average in 2019, **22% of all RWY 14 jet departures to the north or east flew H140 on departure.**

A historical review (see **Table 2**) shows that the use of H140 on departure has slowly increased since 2012, although remains a relatively low number of overall RWY 14 departures.

01 April-30 June	RWY 14 Jet Departures (All destinations)	RWY 14 Jet Departures (All N/E destinations)	RWY 14 Jet Departures H140 (N/E destinations)	% of RWY 14 Jet Departures for N/E destinations H140, compared to all jet N/E jet departures
2012	3862	586	35	6%
2014	3481	547	45	8%
2016	3565	719	57	8%
2018	4155	801	116	14%
2019	4319	676	137	20%

Table 2: Historical RWY 14 and H140 usage data for the late autumn/early winter period. Source: Airservices ANOMS

There would be an approximate **additional 4 NM per arrival** from the south to RWY 14. Applying this to August 2019 traffic data, this would apply to **432 flights per month** (see **Table 3**).

RWY 14 Arrivals from the South (origin)	Number of flights
Auckland	31
Christchurch	2
Queenstown	8
Wellington	7
Baryulgil	1
Avalon	14
Essendon	1
Hobart	4
Melbourne	128
Bankstown	1
Canberra	2
Sydney	220
Newcastle	13
Total	432

Table 3: Arrivals to RWY 14, August-19

There would be an approximate **15 NM reduction per departure off RWY 14 that turns left to head north or east over water**, rather than having to depart RWY heading (H140) to then turn north or east over water. Applying this to the August 2019 traffic data, this applies to **26 flights per month**.

We can determine the impact of additional track mile savings by applying a formula:

$$\begin{aligned}
 & \text{(NM reduction of aircraft departing H070 for north/east destinations)} - \text{(NM addition for aircraft departing H140 to then turn for north/east destinations)} = \text{NET IMPACT} \\
 & (4 \text{ NM} \times 432 \text{ flights}) - (15 \text{ NM} \times 26 \text{ flights}) = \underline{\underline{1338 \text{ additional track miles}}}
 \end{aligned}$$

Using methodology based on ICAO⁶ Carbon Emissions Calculator Methodology, per month this equates to **9.5 extra tonnes of fuel** and **30 extra tonnes of CO₂ emissions**.

In conclusion:

The proposed amendment to the arrival path would degrade operational safety due to the excessive altitude restrictions on both arrivals and departures. Additionally, this proposal has a net negative impact on emissions and fuel burn and is likely to increase noise over overflown communities. This proposal will not progress for further investigation.

⁶ International Civil Aviation Organisation (ICAO)

Proposal 2: Adjust the RWY 14 standard departure heading to H095 for aircraft departing to the north or east

The Gold Coast Airport NAP states that departures off RWY 14 to the north and east are to expect a left turn to become established over water. *Gold Coast ATC tower and Brisbane Terminal Control Unit coordination and operating procedures* states that the controller shall assign a left turn on H070 until at least 2NM over water.

The controller may instead issue H140 (maintaining runway heading, straight ahead) if they consider H070 unsuitable (i.e., if there is a departure for the north or east with another aircraft arriving via a southern STAR).

Figure 18 below demonstrates the current ATC operations and includes further description of required altitudes.



Figure 18: Current arrival routes (BERNI V & Y STAR) versus H070 departure.

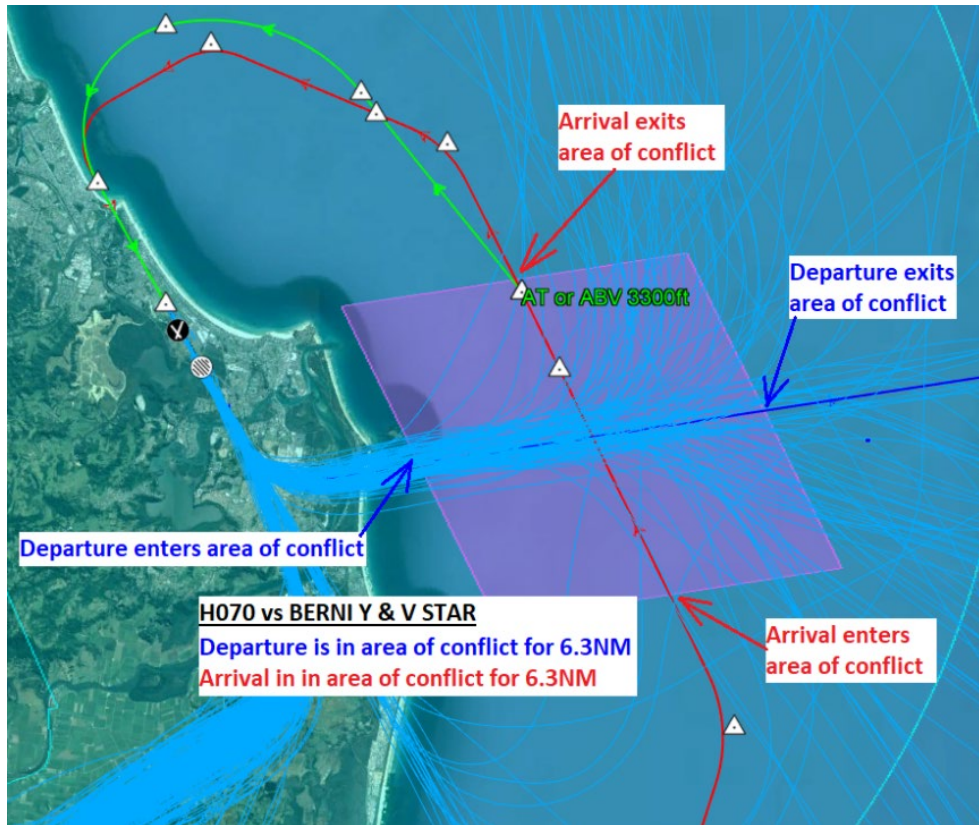


Figure 19: Current arrival routes (BERNI V & Y STAR) versus H070 departure.

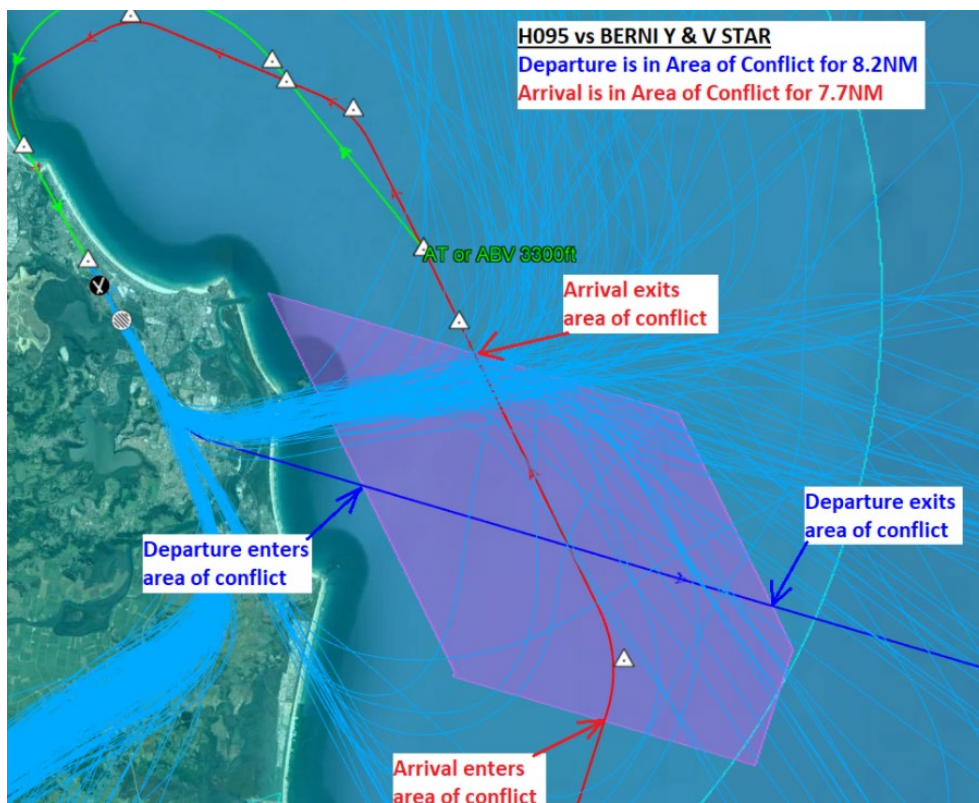


Figure 20: Current arrival routes (BERNI V & Y STAR) versus H095 departure.

Heading H070 has been selected to minimise the time in conflict with the arrival path (due to being a near-perpendicular crossing). This can be seen in **Figure 19** and is outlined in **Table 4**.

Amending this heading to H095 would increase the time in conflict with the arrival path. This can be seen in **Figure 20** and is outlined in **Table 4**.

Heading	Departure Nautical Miles	Times
H070	~6.3	~ 90 – 120 secs*
H095	additional ~1.9	additional ~30 - 45 secs*

Table 4: Distances and times within the area of conflict. *Dependant on aircraft performance and meteorological conditions.

Amending the heading between 070-140 (i.e., H095 as proposed) would increase the period of conflict time between arrival and departure. By increasing the time for an aircraft in the area of conflict, there is a higher likelihood of ATC using H140 for departure as outlined in the NAP/LOA.

In June 2012, Airservices explored amending the departure headings, trialling various headings within the range of 020 and 090. There was no community support for the trial procedure to be implemented permanently.

In conclusion:

Adjusting the RWY 14 standard departure heading from H070 to H095 for aircraft departing to the north or east would increase the time in which a departure and arrival are in conflict. This is likely to result in H140 being used more frequently. This proposal will not progress for further investigation.

Proposal 3: Increase the management of international flights to RWY 32 via the over water (offset) RNP-AR approach

Our investigation of this proposal reviewed traffic numbers of eligible aircraft (pre-COVID) and a comparison of the LA_{max} 60dB(A) noise contours (based on a Boeing 737-800) of both RWY 32 RNP-AR approaches and found that:

An average of **7 aircraft per day** would be eligible to be changed to the offset from flying the straight in.

There would be a **net reduction** in population overflight of approximately 8200 people.

No difference in noise sensitive sites.

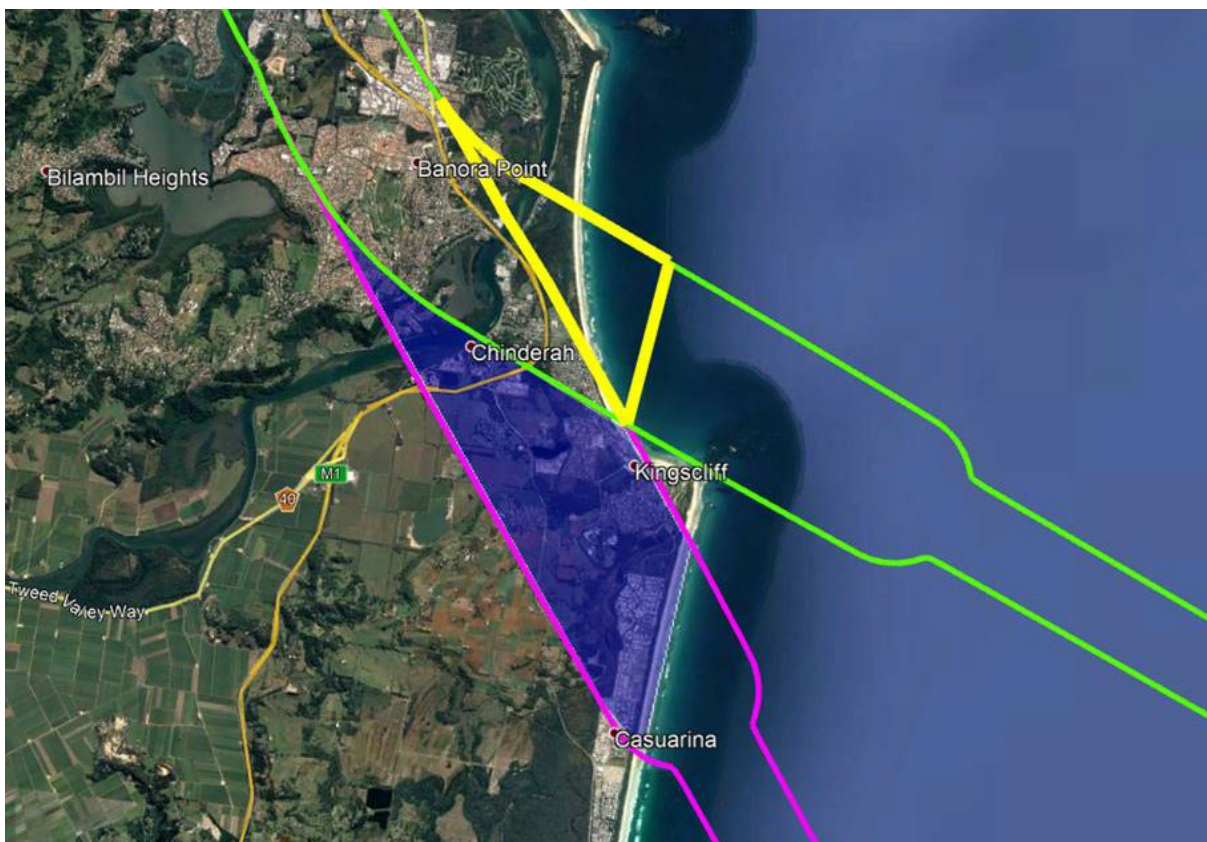


Figure 21: A comparison of B738 LA_{max} noise contours for the straight in (pink) and offset (green) RNP-AR approaches, showing the area that will experience more flights (yellow) versus the area that will experience less (indigo shading).

In conclusion:

This proposal has progressed through internal Airspace Change Program. The Airservices Environmental Impact Assessment identified requirement for referral to Department of Environment. Airservices has received a decision from Department of Environment, stating that “Minister’s advice is not required”. This fulfills our obligations under the EPBC Act for this change.

Proposal 4: Design an over water (offset) RNP RWY 32

The proposal is for Airservices to design and implement an over water (offset) RNP approach to RWY 32, similar to the RNP Z RWY 14, which is not runway aligned. It is proposed that this offset RNP RWY 32 could be used by aircraft who are not approved to fly the RNP-AR approach.

The current RNP Z RWY 32 is the only vertically guided approach to RWY 32 that everyone can fly (not everyone can fly RNP-AR). The maximum turn angle at the final approach fix (FAF) is 15° for an approach that includes this vertical guidance.

We investigated what an offset approach may look like at the following final segment distances (see **Figure 19**):

A 5 nautical mile final segment (current length):

- This would only change which part of the Kingscliff community is overflown, we do not consider proposals that seek to move aircraft noise from one community to another as responsible.
- An offset intermediate approach will make the approach unnecessarily more challenging to fly.

A 3 nautical mile final segment (the shortest possible per PANS-OPS):

- This would again, only change which part of the Kingscliff community is overflown, we do not consider proposals that seek to move aircraft noise from one community to another as responsible.
- An offset intermediate approach will make the approach unnecessarily more challenging to fly.

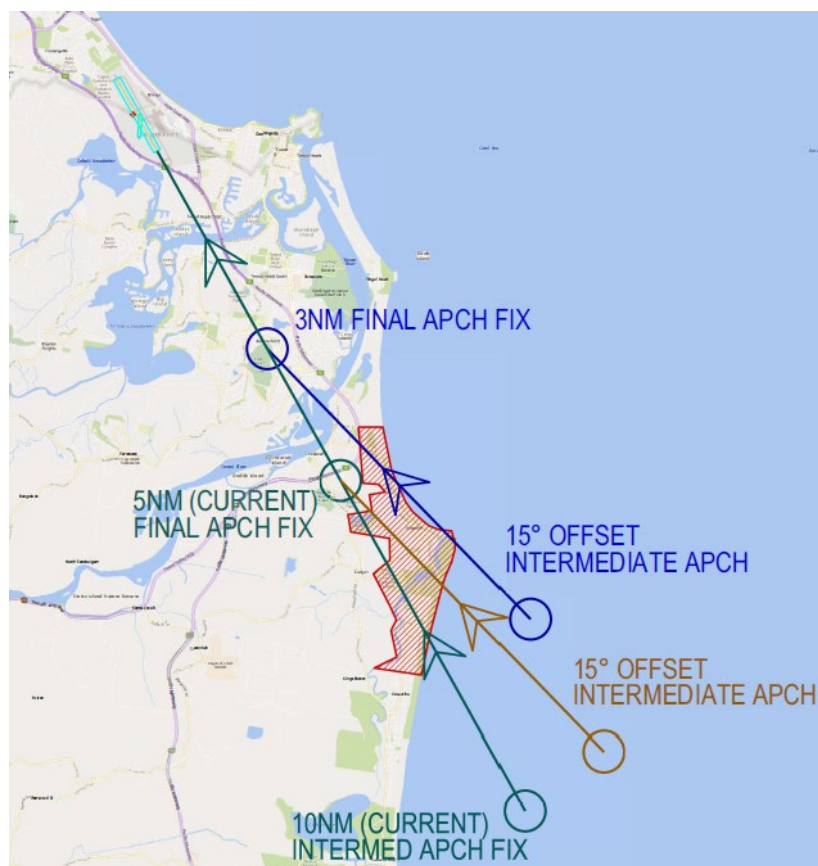


Figure 22: A comparison between community (red shade) overflight for the current RNP Z RWY 32 (green) and conceptual offset RNP approaches (orange and blue).

The Civil Aviation Safety Authority (CASA) is the government body that regulates Australian aviation safety and is responsible for the approval of flight paths before they can be implemented. In the past, CASA have rejected offset RNP approaches due to the challenging design for aircraft on approach. The most recent example is a rejected proposed approach at Shellharbour airport.

The RNP Z RWY 14 has been offset for obstacle avoidance (Q1 skyscraper). There are no obstacles south of the Gold Coast airport that would warrant such an offset.

In conclusion:

There are no obstacles or terrain precluding the safe operation of aircraft on the runway aligned path to Gold Coast RWY 32 and this proposed change would make the approach unnecessarily more challenging to fly (changes like this have previously been rejected by CASA). Furthermore, the introduction of an offset would only change the part of the Kingscliff community is overflown. This proposal will not progress for further investigation.

6. SUMMARY OF FINDINGS

Proposal 1

The proposed amendment to the arrival path would degrade operational safety due to the excessive altitude restrictions on both arrivals and departures. Additionally, this proposal has a net negative impact on emissions and fuel burn and is likely to increase noise over overflown communities.

This proposal will not progress for further investigation.

Proposal 2

Adjusting the RWY 14 standard departure heading from H070 to H095 for aircraft departing to the north or east would increase the time in which a departure and arrival are in conflict. This is likely to result in H140 being used more frequently.

This proposal will not progress for further investigation.

Proposal 3

This proposal has progressed through internal Airspace Change Program. The Airservices Environmental Impact Assessment identified requirement for referral to Department of Environment. Airservices has received a decision from Department of Environment, stating that “Minister’s advice is not required”. This fulfills our obligations under the EPBC Act for this change.

Airservices will progress this community suggested alternative to community engagement in early 2023.

Proposal 4

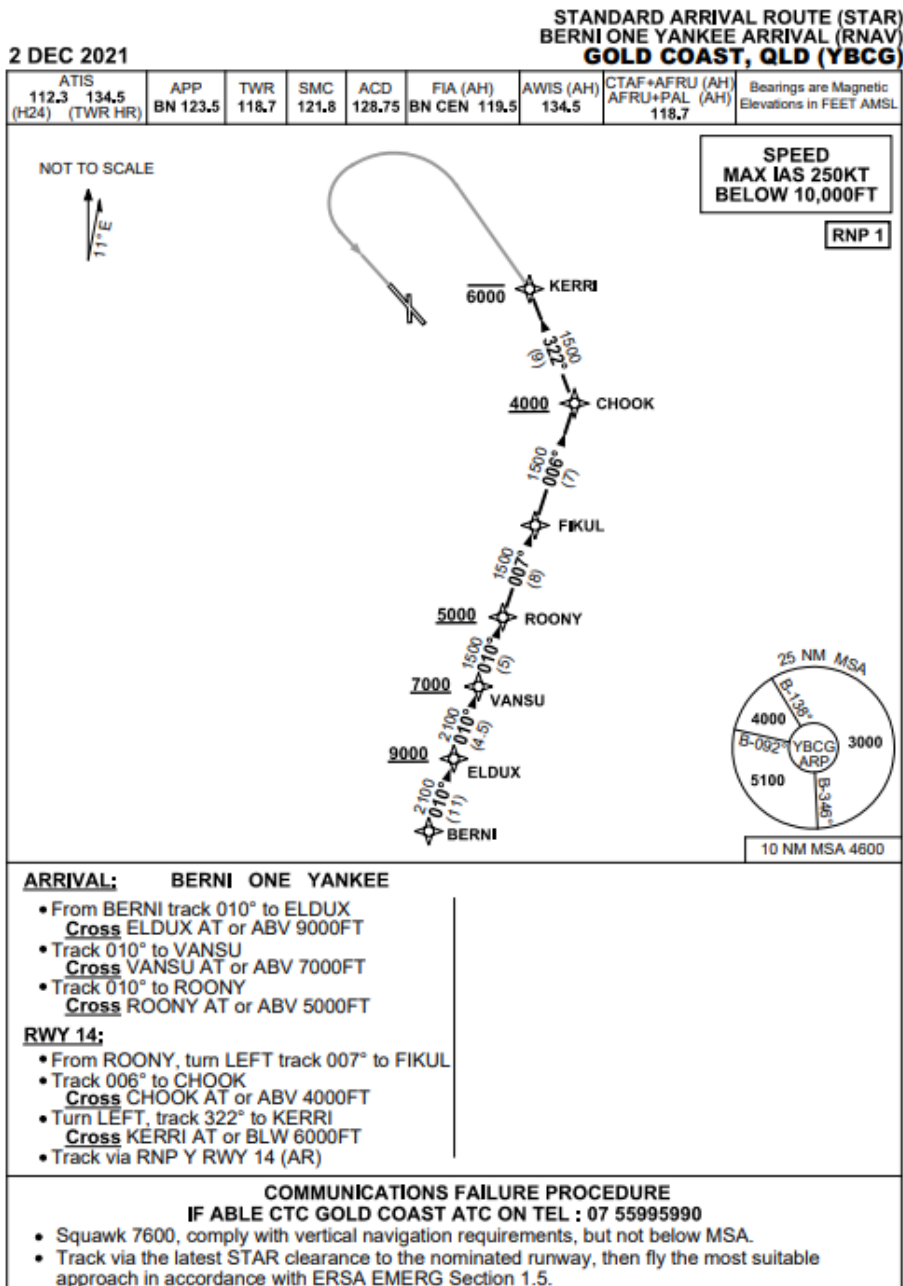
There are no obstacles or terrain precluding the safe operation of aircraft on the runway aligned path to Gold Coast RWY 32 and this proposed change would make the approach unnecessarily more challenging to fly (changes like this have previously been rejected by CASA). Furthermore, the introduction of an offset would only change the part of the Kingscliff community is overflown.

This proposal will not progress for further investigation.

APPENDIX A – DAP CHARTS

A.1 RWY 14 Arrivals from the South

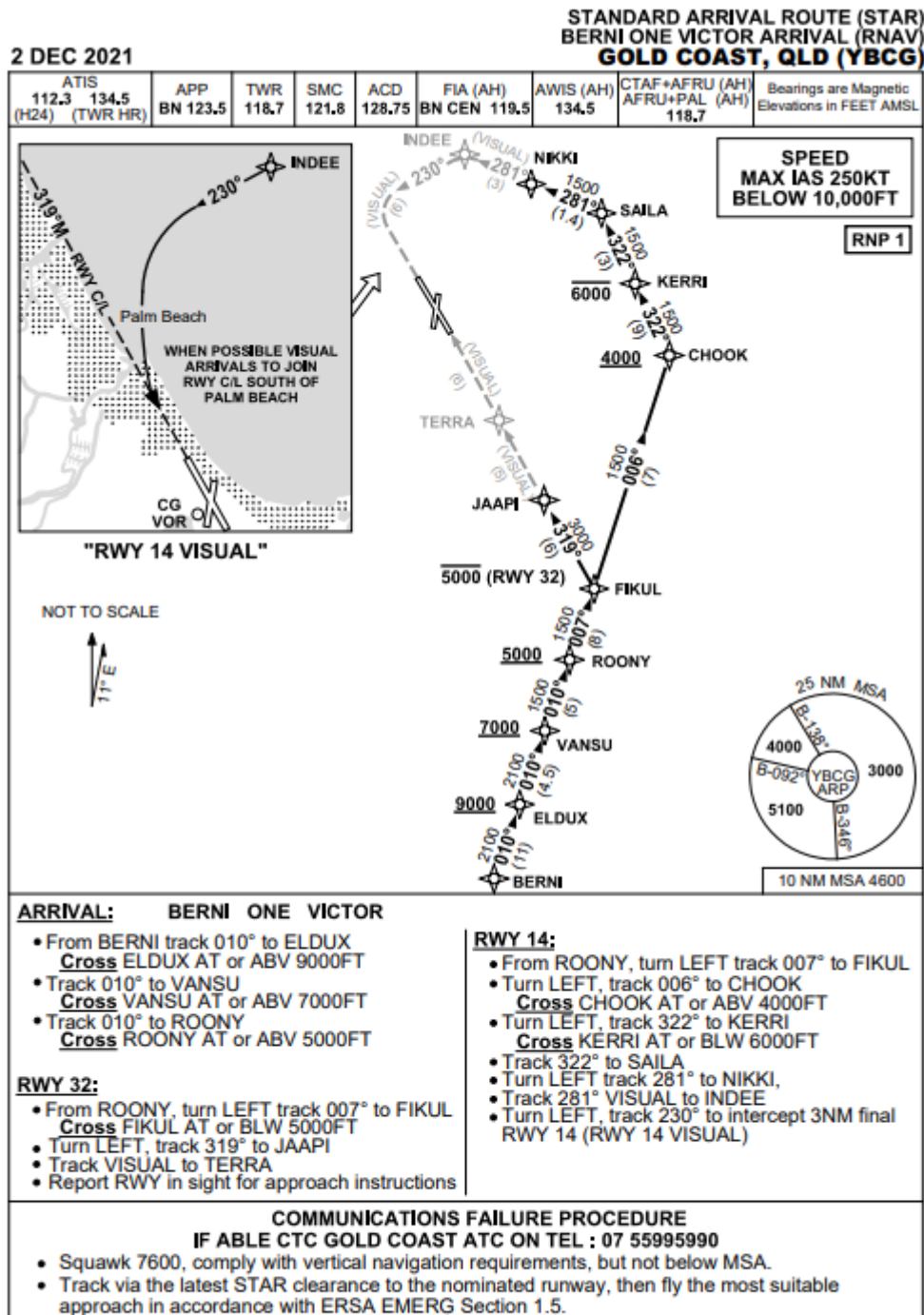
A.1.1 STAR BERNI ONE YANKEE ARRIVAL (RNAV)



Changes: Editorial.

BCGSR08-169

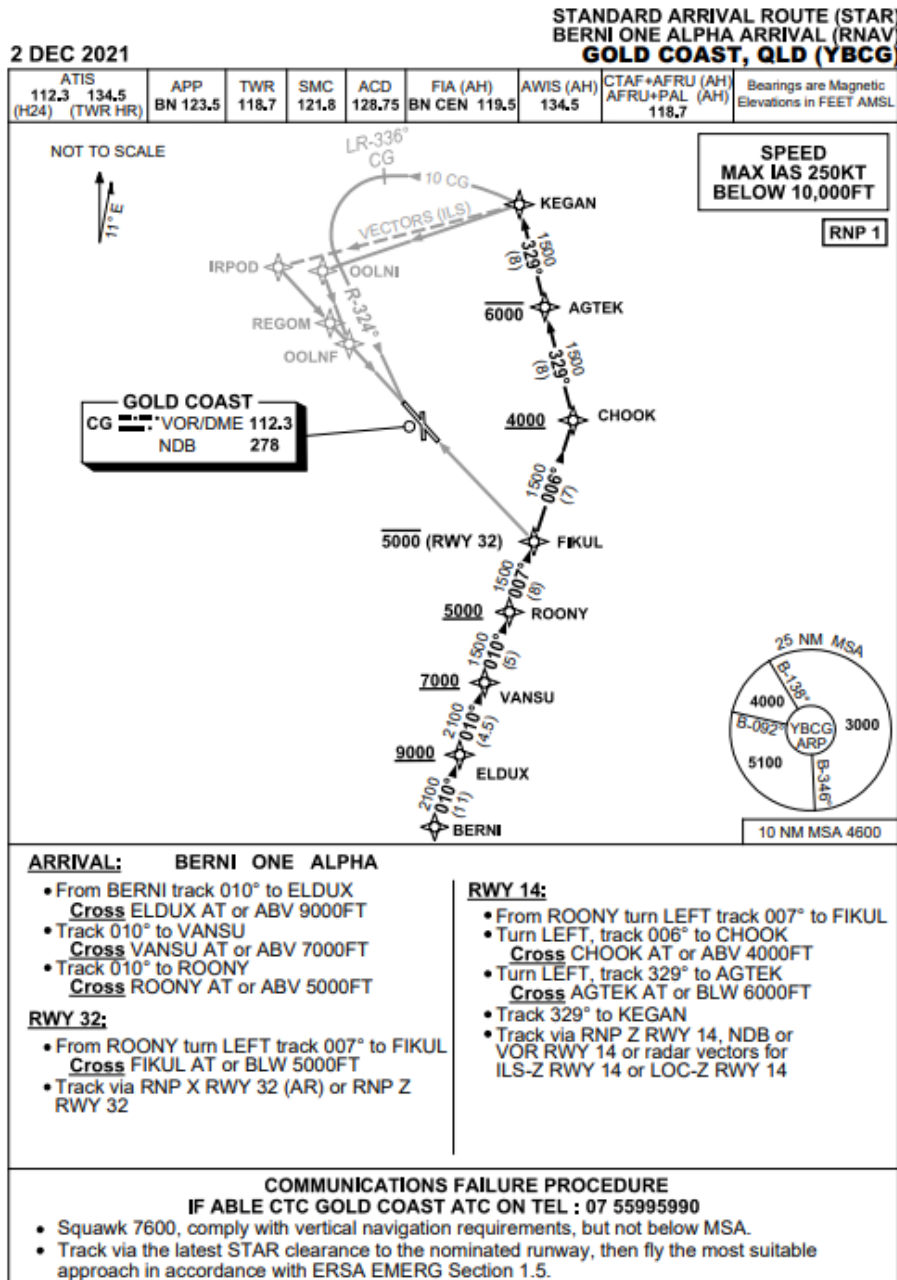
A.1.2 STAR BERNI ONE VICTOR ARRIVAL (RNAV)



Changes: Editorial.

BCGSR07-169

A.1.3 STAR BERNI ONE ALPHA ARRIVAL (RNAV)

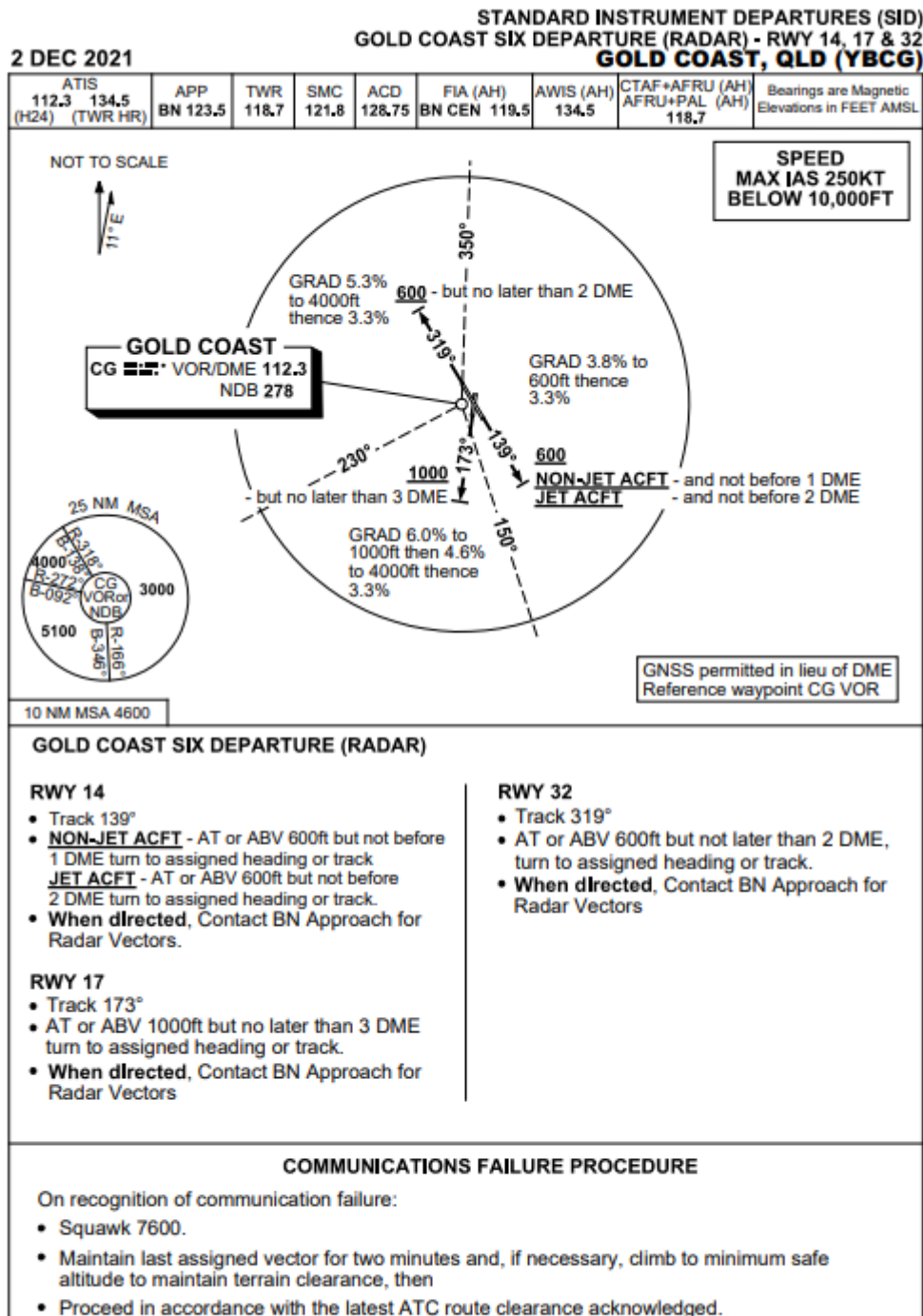


Changes: Editorial.

BCGSR06-169

A.2 RWY 14 Departures to the North and East

A.2.1 SID GOLD COAST SIX DEPARTURE (RADAR)

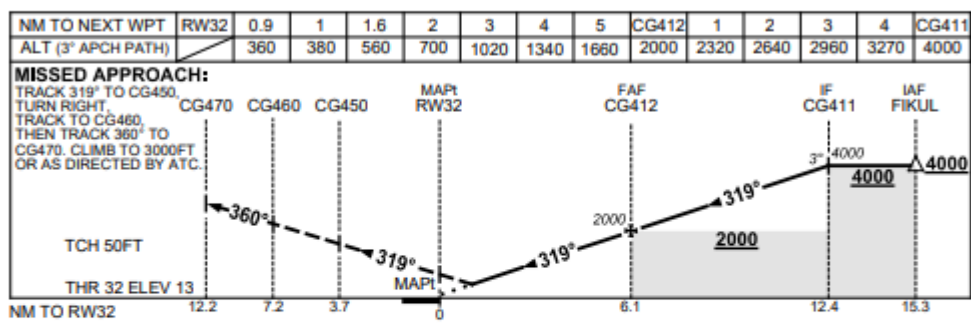
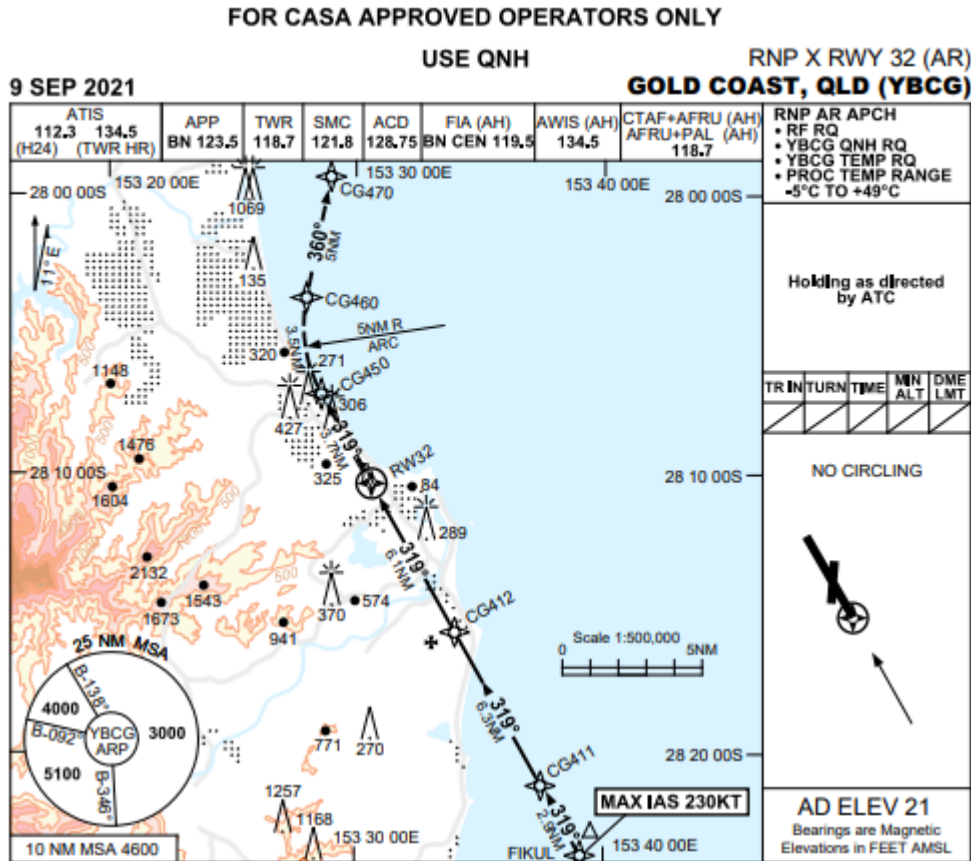


Changes: RWY 14 AND EAST SECTOR GRAD, RWY 17 AND SW SECTOR GRAD, Editorial.

BCGDP01-169

A.3 RWY 32 RNP-AR approaches

A.3.1 RNP X RWY 32 (AR)



NOTES

CATEGORY	A	B	C	D
RNP 0.2		360 (347-1.9)		
RNP 0.3		560 (547-3.1)		
CIRCLING	NOT AUTHORISED			
ALTERNATE	(1239-4.4)	(1339-6.0)	(1339-7.0)	

1. MAX IAS:
FIKUL : 230KT.

Changes: CHART TITLE, PBN SPECIFICATION BOX, Editorial.

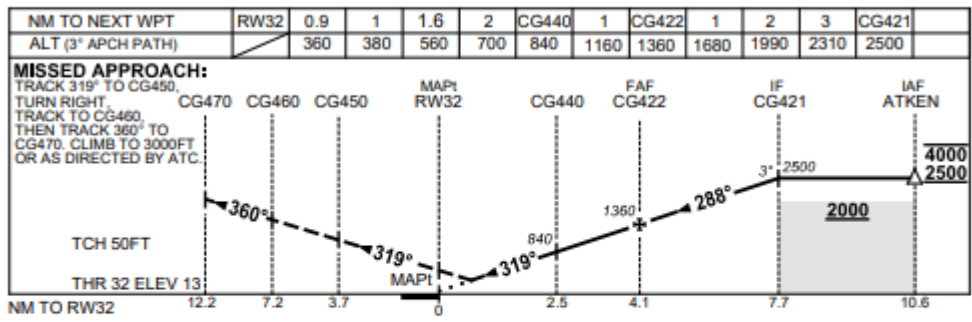
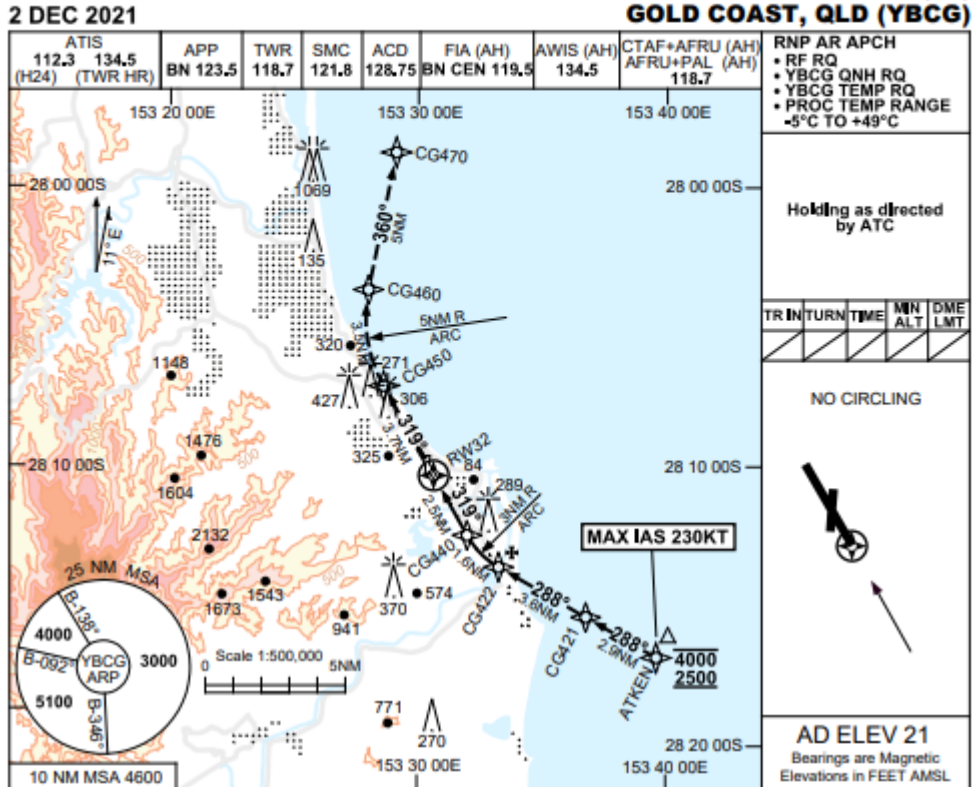
BCGGN12-168

A.3.2 RNP Y RWY 32 (AR)

FOR CASA APPROVED OPERATORS ONLY

USE QNH

RNP Y RWY 32 (AR)



NOTES

CATEGORY	A	B	C	D
RNP 0.2		360 (347-1.9)		
RNP 0.3		560 (547-3.1)		
CIRCLING	NOT AUTHORISED			
ALTERNATE	(1239-4.4)		(1339-6.0)	(1339-7.0)

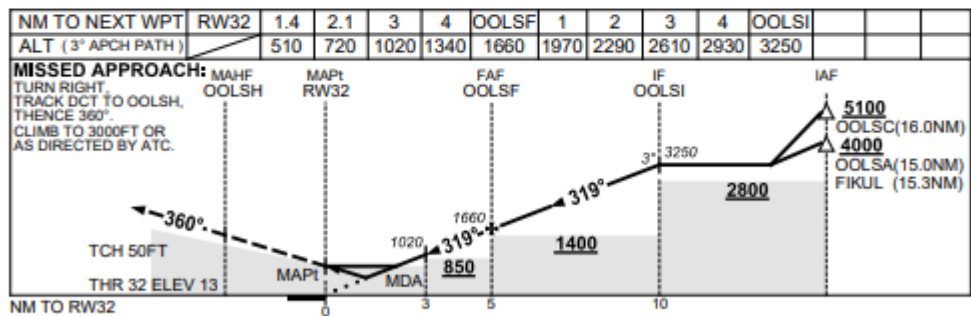
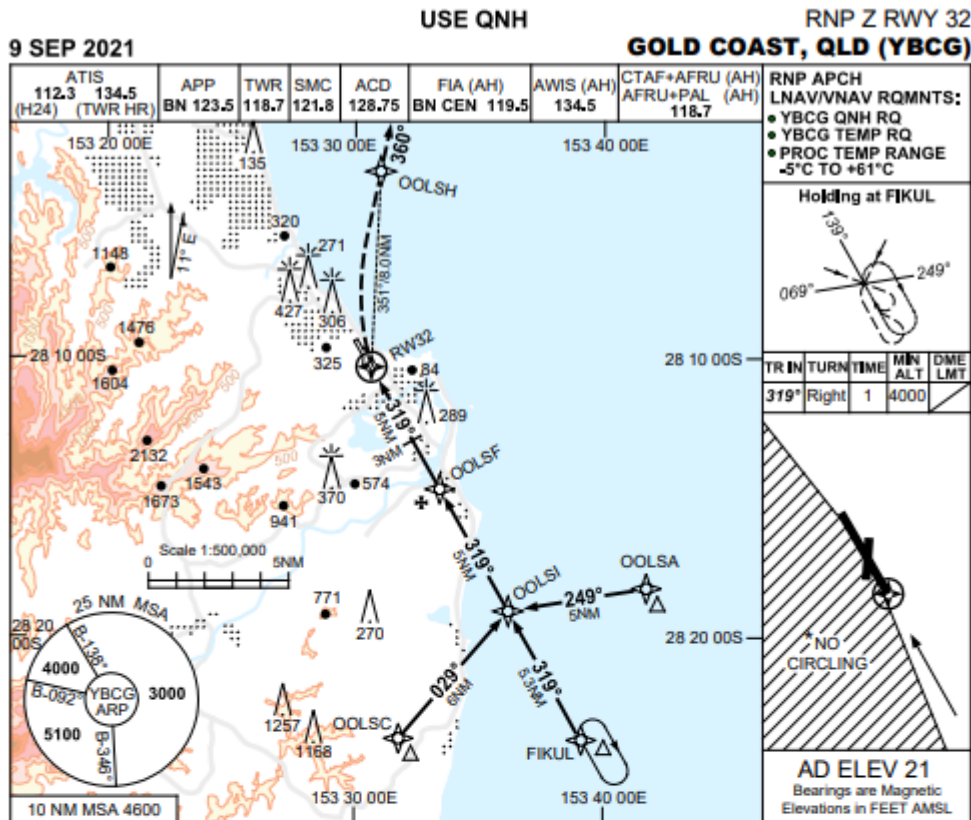
1. MAX IAS:
ATKEN : 230KT.

Changes: Editorial.

BCGGN11-169

A.4 RWY 32 RNP approach

A.3.1 RNP Z RWY 32



CATEGORY	A	B	C	D
LNAV/VNAV		510 (497-2.8)		
LNAV		720 (707-4.0)		
CIRCLING *	860 (839-2.4)		960 (939-4.0)	960 (939-5.0)
ALTERNATE	(1339-4.4)		(1439-6.0)	(1439-7.0)

NOTES

- MAX IAS: INITIAL : 210KT.
- NO CIRCLING WEST OF RWY 14/32.
- COLOUR: SEE SPEC NOTICES.

Changes: CHART TITLE, PBN SPECIFICATION BOX.

BCGGN02-168