Environment Assessment of Hobart Airport – Proposed SIDs & STARs

Effective 28 June 2017

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1 Introduction

Hobart International Airport (YMHB) is an airport located in Cambridge, 17 km northeast of Hobart. It is the major passenger airport in Tasmania. The major airlines servicing the airport are Qantas, Jetstar, Virgin Australia and Tiger Airways Australia operating domestic flights predominantly to Melbourne airport and Sydney airport.

The airport is situated on a narrow peninsula with take-offs and landings directed over bodies of water regardless of approach or departure direction. The region immediately surrounding the airport remains largely unpopulated, which enables the airport to operate curfew-free services.

The airport has one runway, 12/30 which is 2,251 metres long and 45 metres wide. Hobart Airport is equipped with approach, runway and taxiway lighting for day and night time operations. The Hobart Air Traffic Control Tower's opening hours are between 6am and 10:30pm local time. Figure 1 shows a satellite image of Hobart Airport.

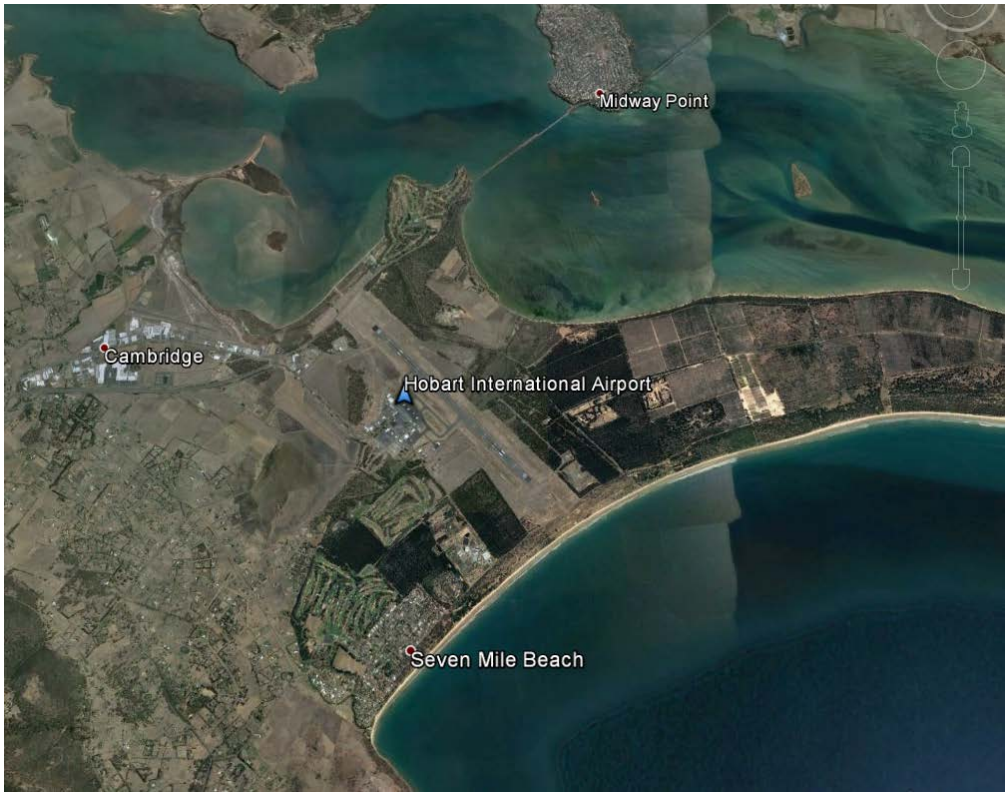


Figure 1 Hobart Airport

2 The Proposal

The purpose of this document is to conduct an environmental assessment (EA) of a proposal to introduce new SIDs and STARs at Hobart Airport. Due to an increase in traffic for both Regular Passenger Transport and General Aviation movements into and out of Hobart, the current route structure now lacks in efficiency and inbuilt separation assurance causing delays on the ground and in the air, and putting a high workload on both Enroute and Tower controllers. There are currently no STARs at Hobart Airport. There is no consistency in aircraft movement; tracking is amended tactically depending on the traffic mix and weather conditions.

The proposal is development of an integrated SID/STAR package for Hobart, designed using advancements in PBN technology to provide separation assurance between arriving and departing traffic. The introduction of new technologies such as performance based navigation and new on board systems have meant that new terminal procedures are able to be developed to provide air traffic management (ATM) efficiencies and benefits for the aviation industry. Other benefits include:

- Greater predictability in tracking irrespective of runway in use, leading to lower workload in the cockpit because of reduced manipulation of on board systems at high workload times.
- Continuous climb and descent capability wherever possible
- Better integration of traffic from ports within Tasmania
- Introduction of a racetrack pattern between Hobart and other Tasmanian ports.

The SIDs and STARs are below FL200 (20,000ft AMSL) and over land. The proposed change will not affect the number of aircraft movements nor change to operating hours. There may be a small increase in distance flown but likely to be less than 10NM.

The proposed SIDs (magenta) and STARs (blue) are shown in Figure 2.

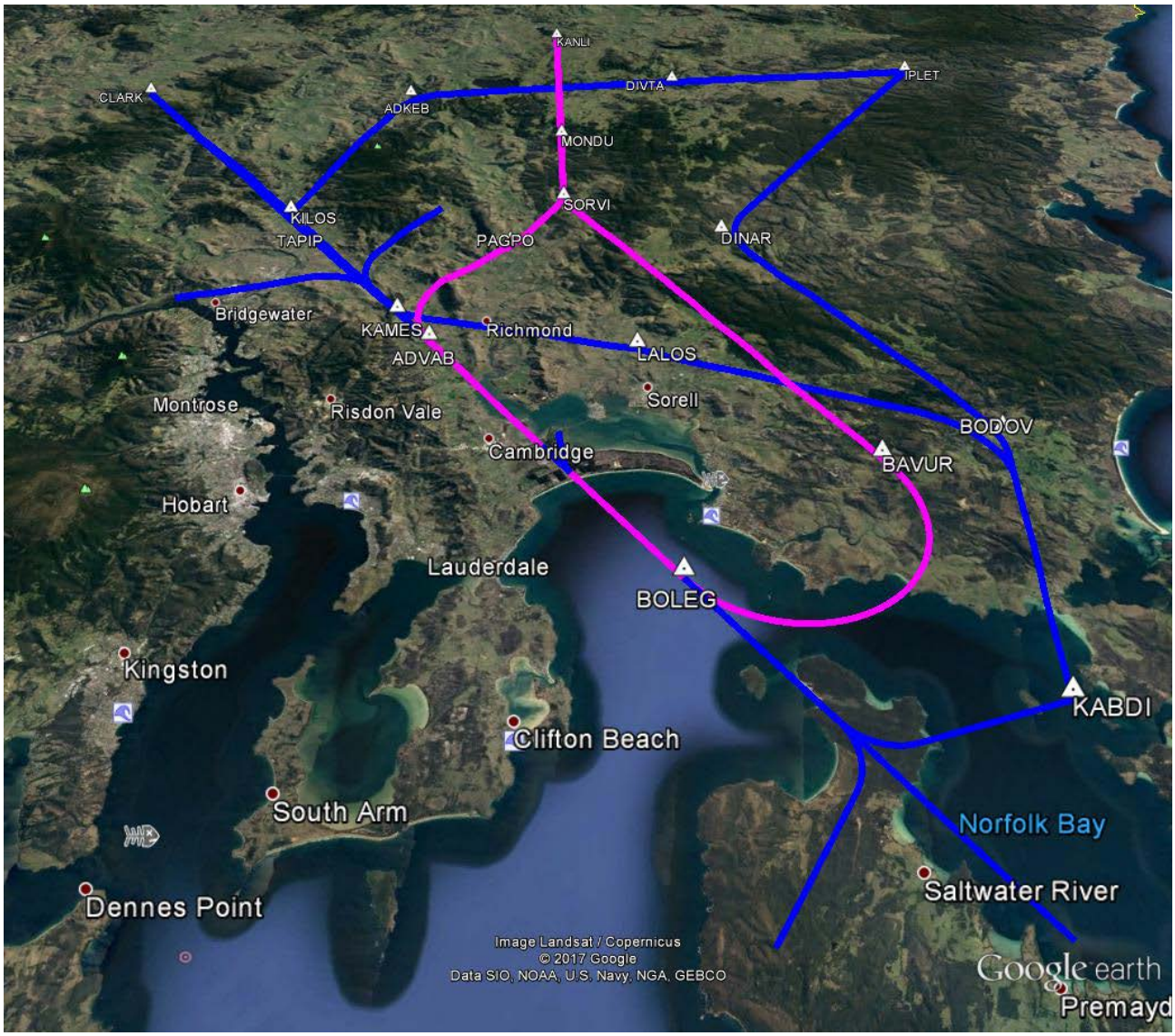


Figure 2 Proposed SIDs (magenta) and STARs (blue) at Hobart Airport

The most current draft DAP plate (as of the date of preparation of this EA) is provided as Appendix B.

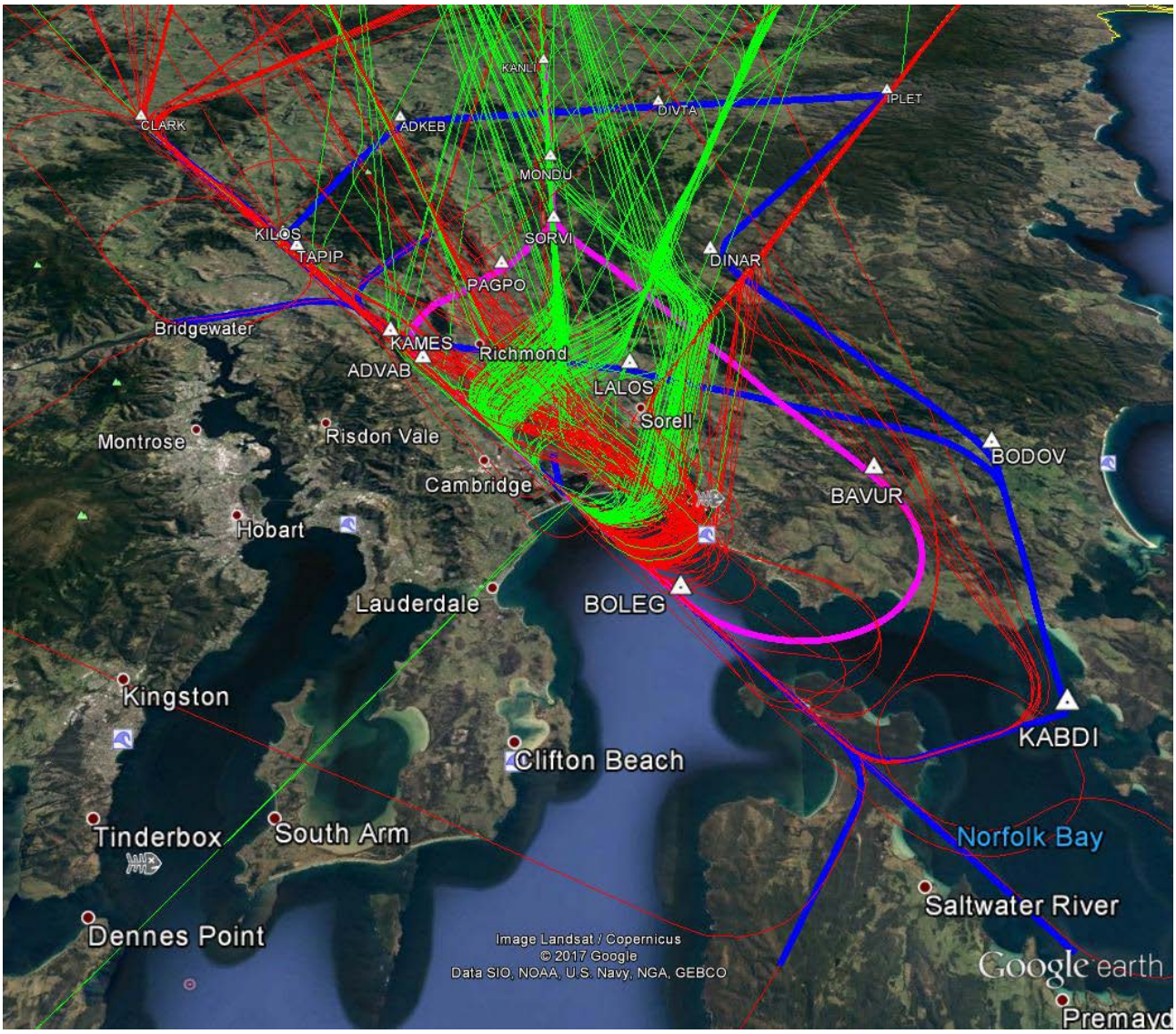


Figure 3 Proposed SIDs (magenta) and STARs (blue) at Hobart Airport, with arrival (red) and departure (green) operations for 1-7 February 2017.

3 Methodology

This EA examines the potential environmental impact of the proposed flight path realignment through examination of air traffic movements on the existing and proposed flight paths, in order to assess the potential for increased aircraft noise and potential impacts on matters of Natural Environmental Significance (NES) or on matters of cultural or heritage value.

3.1 Assumptions

This assessment is based on the following:

- INM modelling
- DAP for procedure changes
- Traffic movements data from Airservices Publication Unit
- Operational Data Analysis Suite (ODAS)

3.2 Procedures

Three procedures are assessed in this analysis:

- Kanli One SID
- Iplet One Alpha STAR
- Clarke One Alpha STAR.

4 Assessment criteria

A number of criteria were considered as part of this environmental assessment, including:

- potential aircraft noise impact on communities
- potential impact on matters of national environmental significance
- potential impact on heritage and cultural matters, including indigenous heritage.

The assessment criteria adopted by Airservices Australia (Appendix A) to determine potential environmental impact of proposed ATM system changes with respect to changed aircraft noise. The assessment criteria were developed giving consideration to relevant Australian Standards, World Health Organisation (WHO) guidance and to the National Safeguarding Airports Guidelines (NASAG). Stakeholder consultation was undertaken throughout the assessment criteria development.

Relevant metrics as set out in 4.1 below, have been applied in this assessment focussing on those that provide analytical insight to best represent the potential impacts of the proposed flight path changes.

4.1 Noise metrics

4.1.1 LAmax – indicative noise levels

The LAmax is a noise metric that shows the maximum noise level of a single noise event associated with a particular flight path. The LAmax noise metric is useful for determining the potential noise change associated with geographical movement of a flight path.

4.1.2 Noise Modelling

INM version 7d was used to model noise impacts. The INM is a software tool developed by the United States of America Federal Aviation Administration (FAA) for the purpose of modelling aircraft noise. The INM is an average noise model, designed to determine aircraft noise based upon an entire airport's operations, with movement information averaged over time. INM modelling only considers noise from aircraft movements. The INM has no capability to calculate results with reference to ambient noise. Noise modelling requires input of assumptions in order to reflect the variability in conditions. These include:

- Weather conditions – a single set of standard weather conditions based on Bureau of Meteorology average data have been modelled. In reality, weather conditions will vary.
- Standard aircraft operation – an assumption that each aircraft type will be operated according to a standard Noise, Power Distance (NPD) curve is used. In reality, each airline and pilot may operate the aircraft differently, such as using different engine power settings, or retracting landing gear at different times.
- Standard arrival and departure profile – an assumption is made that every aircraft will operate according to a standard approach and departure profile; essentially operating at the same rate of climb or descent. In reality, arrival and departure profile may be varied on an individual basis for a number of reasons including:
    - Traffic
    - Weather and cloud conditions
    - Pilot requirements
    - Separation and sequencing requirements for Air Traffic Control (ATC)

4.2 Night and Day Criteria

The usage of the terms day (6:00am to 11:00pm) and night (11:00pm to 6:00am) is as per the definition of night (11:00pm to 6:00am) utilised for the purposes of Australian curfew airports. This definition is applied consistently for all environmental assessments, whether or not a curfew is in place at the specific airport and applies to the Assessment criteria, as provided in Appendix A.

4.3 Matters of Natural Environmental Significance (NES)

The Protected Matters Search Tool was used to determine the presence of matters of national environmental significance below the current and proposed flight path. The potential impact of aircraft over flights was assessed on an individual basis where matters of NES were identified.

5 Data

5.1 Traffic levels

Data from Airservices Publication Unit for the 2016 calendar year show that there was a total of 26,300 movements for Hobart Airport, 22,184 excluding helicopters which will not utilise the proposed procedures.

For the purpose of this assessment it is assumed that there were approximately 11,090 departures and 11,090 arrivals (an average 30 arrivals and departures) at Hobart Airport across all runways.

airservices

Movements at Australian Airports - Cal YTD

Data sourced from the Operational Data Warehouse

2016 Calendar Year Totals

As at DEC 2016

Arrival Port Name	Arrival Port Code	Over 136 tonnes	Between 7 tonnes and 136 tonnes	Under 7 tonnes	Helicopter	Military	Total
HOBART	YMHB	2	18,996	2,696	4,116	490	**26,300**

Report Notes:

1. Movements are the sum of Arrivals and Circuits multiplied by 2 ie (A + C) x 2
2. Arrival data is only recorded during hours of tower operation, therefore actual movements at non H24 locations may be higher than published.
3. Movements at each Port reflect movements at times local to that Port, ie: a conversion from UTC time has taken place on production of the report.
4. Data Source: Eurocat air traffic control system, Tower flight strips and Tower running sheets
5. Data is correct as at "Report run date". Changes to data after this time may occur as a series of checks and validations occur.
6. Airservices Australia takes no responsibility for the accuracy of the information contained in this Report and excludes all liability arising from any reliance placed upon it. All data is provided for informational purposes only and independent expert advice should be obtained before relying on such data.
7. Services for Hobart and Cambridge airports are provided by the one Air Traffic Services facility therefore when considering statistics for ATS purposes movements for both airports should be considered.

Figure 4 Aircraft movements at Hobart Airport for 2016 calendar year

Further data for Hobart Airport were sourced from ODAS and is shown in Table 1. The data shows that there was a total of 24 arrivals and 23 departures on the selected day. The A320 was the most common aircraft type for the chosen period.

Table 1: Operation data for Hobart Airport extracted from ODAS, for the 24hrs UTC of 03 May 2016

Aircraft Type	Number of Arrivals	Number of Departures
A320	6	6
A321	2	2
B712	6	6
B733	1	1
B738	5	5
E190	2	2
F50	1	
SW4	1	1
Total	***24***	***23***

6 Analysis

6.1 Altitude and Noise Levels

Table 2 shows modelled altitude and noise levels for aircraft at various distances. The modelled noise levels were used to estimate the noise levels on the ground for different segments of STARs and SIDs for Hobart Airport. The LAmax noise levels for departures for the most common aircraft at Hobart (A320-232) is estimated at 61dB(A) at 20km. The noise levels falls to below 60dB(A) at 25 km or more from SOT, which is below the Airservices threshold for potential. For arrivals, at 20km from landing threshold, the noise levels for most aircraft types would be below 60dB(A) except for the B737s. However the noise levels for the 737s falls below 60dBA at 25 km or more

Table 2: Modelled altitude and noise levels based on INM model Version 7b

LAmax Noise levels based on INM model Version 7b.										
	Distance from SOT (km)- Departures									
Aircraft Type	20		25		30		35		40	
	Altitude (ft)	LAmax (dB(A))	Altitude (ft)	LAmax (dB(A))	Altitude (ft)	LAmax (dB(A))	Altitude (ft)	LAmax (dB(A))	Altitude (ft)	LAmax (dB(A))
A320232	5600	61	7200	58	8500	55	10000	53	>10000	42
A321232	5000	64	6400	61	7700	59	8800	57	>10000	55
B737300	5900	65	7500	62	9200	60	>10000	56	>10000	44
B737400	4700	67	7700	64	9300	62	>10000	57	>10000	46
B737800	5900	67	7500	64	9200	62	>10000	58	>10000	46
EMB14L	5300	58	6800	55	8100	53	9400	51	>10000	44
Emb 190 & Emb 170	8700	57	>10000	52	>10000	37	>10000	26	>10000	19
F10065	5000	65	6300	63	7700	61	8700	59	9800	58
DO228	7600	50	9000	48	>10000	45	>10000	33	>10000	25
DHC8	7300	46	8900	44	>10000	42	>10000	33	>10000	27
DHC830	5500	49	7100	47	7700	45	8800	44	9800	43
SF340	8400	55	>10000	53	>10000	42	>10000	33	>10000	26
	Distance from Landing Threshold (km)- Arrivals									
	20		25		30		35		40	
	Altitude (ft)	LAmax (dB(A))	Altitude (ft)	LAmax (dB(A))	Altitude (ft)	LAmax (dB(A))	Altitude (ft)	LAmax (dB(A))	Altitude (ft)	LAmax (dB(A))
A320211	3000	58	3200	58	4300	56	5200	53		50
A320232	3000	59	3000	59	3800	57	4600	55	5400	53
A321232	3000	58	3200	58	4000	55	5000	52	5800	50
B737300	3400	62	4300	59	5200	56	6000	53		44
B737400	3400	63	4300	59	5200	56	6000	53		44
B737800	3000	62	3000	62	3600	61	4400	58	5400	55
EMB14L	3400	55	4300	51	5200	47	6000	44		35
Emb 190 & Emb 170	3400	58	4300	56	5200	53	6000	50		40
F10065	3400	61	4300	58	5200	55	6000	53		44
DHC8	3400	53	4300	50	5200	48	6000	46		40
DHC830	3400	53	4300	50	5200	48	6000	46		40
DO228	3400	57	4300	54	5200	51	6000	49		41
SF340	3400	60	4300	58	5200	55	6000	53		46

Using available data from ODAS, the Airservices Publication Unit and modelled altitude and noise levels, an analysis of potential impacts associated with each segment (as per Figure 3) is provided in Table 3. Where indicated a more detailed analysis is then provided in Section 6.1.1.

Table 3 Analysis of proposed procedures by segment

Segment	Description	Procedure Type	Analysis of Segment
CLARK WPT – Rwy 14	No change to existing flight path	STAR	No change to existing flight path – no detailed assessment of the segment required
IPLET-ADKEB-KILOS	New STAR segment	STAR	KILOS is 32 km from Runway threshold INM modelling shows that at such distance arrival aircraft are between approximately 4000 -6000ft with noise levels further away from KILOS likely to be less than 60dB(A) . Note: low density rural residential population area under the segment. Low movement numbers forecast (approximately 3-5 per day (based on limited data sample) indicate low/minor environmental impact.
3 LALOS-BODOV-KABDI-RWY30	Lateral change to flight path NEWLY OVERFLOWN SEGMENT	STAR	Dunalley at the coastline is 35km from the runway landing threshold and Copping is 44km. As shown in Table 2, the altitude of arriving aircraft and noise levels likely to be below 60dB(A). Noticeable change in tracking of aircraft over Copping and Dunalley
IPLET – DINAR – BODOV – KABDI RWY 30	New STAR segment	STAR	IPLET – DINAR – BODOV – KABDI RWY 30Arrival track joins the 3 LALOS-BODOV-KABDI-RWY30 STAR at Copping which is 44km from the runway. As for 3 LALOS-BODOV-KABDI-RWY30 STAR above, the altitude of arriving aircraft and noise levels likely to be below 60dB(A). Noticeable change in tracking of aircraft over Copping and Dunalley

Segment	Description	Procedure Type	Analysis of Segment
Rwy 30- ADVAB- - PAGPO - SORVI	No change between runway and ADVAB. Newly overflown area is between ADVAB & SORVI. The area is sparsely populated except for the township of Campania near PAGPO wpt	SID	Campania is 25km from SOT. INM Noise modelling show that the noise level for the larger jets would be above 60dB(A) but below 65dB(A)
Rwy 12-BOLEG-BAVUR-SORVI	No change between runway and BOLEG. Newly overflown area is between BOLEG & SORVI. The area is sparsely populated except for the suburb of Connellys Marsh between BOLEG and BAVUR wpts.	SID	Connellys Marsh is 20km from SOT. INM Noise modelling show that the noise level for the larger jets would be above 60dB(A) but below 70dB(A).

6.1.1 Communities overflown by Kanli One SID

As identified in Table 3, the proposed Kanli One SID is expected to result in potential overflights above 60dB(A) for larger jets over the suburb of Connellys Marsh from Runway 12 and over Campania township from Runway 30.

Due to limitations in track data for this location, an estimate of the likely distribution of departures for each runway was made using Wind Roses from the Bureau of Meteorology. Using these Wind Roses which identify average wind directions at 9AM and 3PM daily for the period from 1958 to 2016 (Appendix C), approximately 50% of wind is from the west, north-west or north indicating departures off Runway 30, with wind directions from the south, south-east and east approximately 20% of the time indicating Runway 12 departures. The Wind Roses indicate that it is calm 4.5% of the time.

For the purposes of this environment assessment, runway distribution is assumed to be an approximate 5:2 ratio. Based on the average of 30 departures per day (Section 5.1), this indicates an average of 9 departures from Runway 12 and 21 departures from Runway 30 per day.

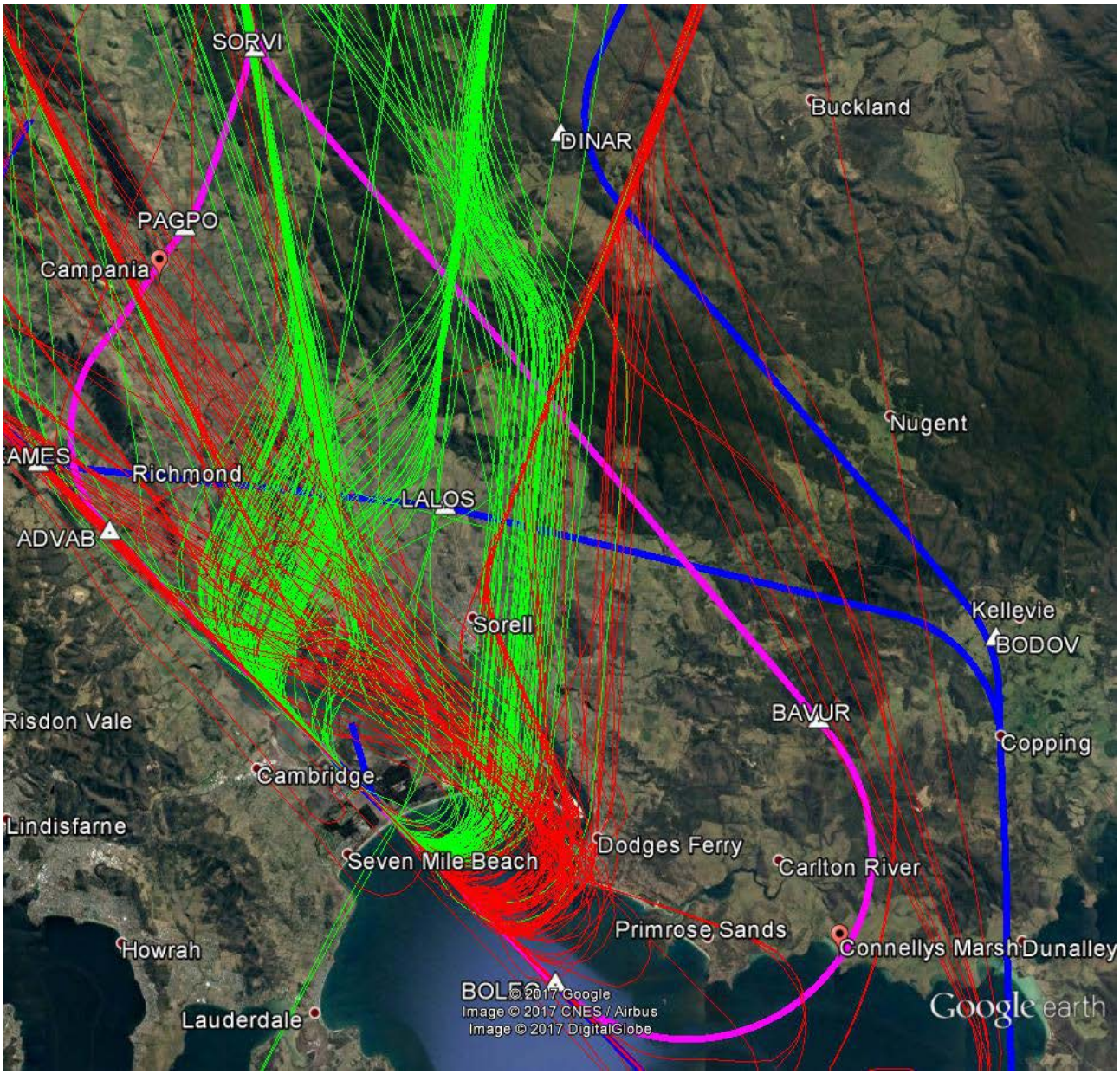


Figure 5 Proposed SIDs (magenta) and STARs (blue) at Hobart Airport, with arrival (red) and departure (green) operations for 1-7 February 2017, zoomed to focus on Connellys Marsh and Campania.

As shown in Figure 5, Campania is currently exposed to some arrival and departure flights with some concentration approximately 1km east of the town. Analysis of these flights show that they are predominately arrivals to Runway 30, which is approximately 30km from Campania along the flight track. At 30km from the landing threshold, larger jets are expected to have noise levels below 60dB(A) (Table 2).

Based on the sample flights, shown in Figure 5, Connellys Marsh had two Runway 30 arrival operations approximately 1.5km south-east from the suburb. These operations were approximately 27km from the landing threshold along the flight track. If these were larger jets, they may have caused N60 noise levels directly underneath the flight track (Table 2).

Based on www.iplan.tas.gov.au , Campania is defined as a village for zoning purposes and Connellys Marsh as low density residential - under the Assessment Criteria (Appendix A), both are considered as rural residential.

Campania is anticipated to get an average of 21 overflights, of which some larger jets will cause N60 noise levels. For a rural residential area, the N60 threshold is 33 day-time flights so the proposed Kanli One SID from Runway 30 will not trigger the threshold for potential significance.

Connellys Marsh is expected to have an average of 9 overflights per day with larger jets causing N60 and N65 noise levels. As a rural residential area, the average number of overflights is below the N65 threshold of 17.

6.2 Matters of National Environmental Significance (NES)

Identified matters of National Environmental Significance (NES) are provided below.

Table 4 Summary of NES

	Number of NES that may occur in area of flightpath change
Wetlands of International Importance:	1
Great Barrier Reef Marine Park:	-
Commonwealth Marine Area:	-
Listed Threatened Ecological Communities	4
Listed Threatened Species:	83
Listed Migratory Species:	43
Commonwealth Heritage Places:	2

As identified in Table 4 above, the areas of the proposed new STARs and SIDs include the Pitt water-orielton lagoon, a wetland of international importance, four threatened ecological communities and 83 threatened species.

6.3 Matters of indigenous heritage and cultural significance

The Mouheneenner people are acknowledged as the traditional owners of the areas of the proposed changes.

Table 5 Summary of identified Heritage locations, identified in the NES

	Number of NES that may occur in area of flightpath change
World Heritage Properties:	2
National Heritage Places:	3
Commonwealth Heritage Places:	2

Of the identified heritage places, the Jordan River levee site is a listed indigenous National Heritage Place. Based on the place details from the Department of the Environment and Energy Australian Heritage Database, this site has indigenous

cultural significance. The location is currently exposed to existing overflights, as well as on ground disturbances associated with the Brighton Bypass and ongoing agricultural activities.

7 Findings

7.1 Noise analysis

Analysis for Iplet One Alpha STAR and Clarke One Alpha STAR identify that for newly overflown areas, noise levels are expected to be below 60dB(A) and will not trigger the thresholds identified in Appendix A. Noticeable change in tracking of overflights is likely at Copping and Dunalley.

Kanli One SID will result in overflights of newly overflown areas, both from Runway 12 and Runway 30 departure operations. Both paths overfly generally sparsely populated areas however, the town of Campania from Runway 30 and the suburb of Connellys Marsh from Runway 12 will experience noise levels for the larger jets above 60dB(A). At both locations, the average number of flights expected is below the relevant threshold for potential significance. It is likely that an increase in overflights and noise levels will be noticed by residents in both these locations.

7.2 Natural environment analysis

Matters of the natural environment were duly considered during the design phase of the proposed new flight paths by matching as closely as possible the proposed flight paths to the existing movements. There is no likely environmental impact on identified threatened species and ecological communities as a direct result of implementing the proposed new flight paths, due to the area being exposed to existing overflights.

7.3 Cultural and heritage values analysis

The Mouheneenner people are acknowledged as the traditional owners of the Hobart region. The proposed SIDs and STARs were designed to match the existing paths as close as possible.

There is no likely environmental impact on areas of indigenous heritage and cultural significance as a direct result of implementing the proposed new flight paths, due to the area being exposed to existing overflights and on-ground disturbances to the identified site of heritage significance.

7.4 Emissions analysis

There is no material difference anticipated as a result of the proposed flight path change. This is due to minimal change in track miles.

8 Conclusion

The proposed new STARs and SIDs at Hobart Airport are not likely to result in any significant environmental impact within the meaning of the Environment Protection and Biodiversity Conservation Act, 1999 (Cth).

The proposed changes may result in a visual change to aircraft tracking and /or noise levels. It is recommended that there be consideration given to establishing a stakeholder engagement strategy to manage any risks associated with the proposed change. Particular note of the changes implemented over Campania and Connellys Marsh should be taken.

There are no impacts expected on areas of Natural Environmental Significance, or on sites of cultural and heritage value as a direct result of implementing the proposed flight paths.

9 Appendixes

Appendix A - Assessment criteria

Appendix B - Draft DAP Plates

Appendix C - Wind roses – Hobart

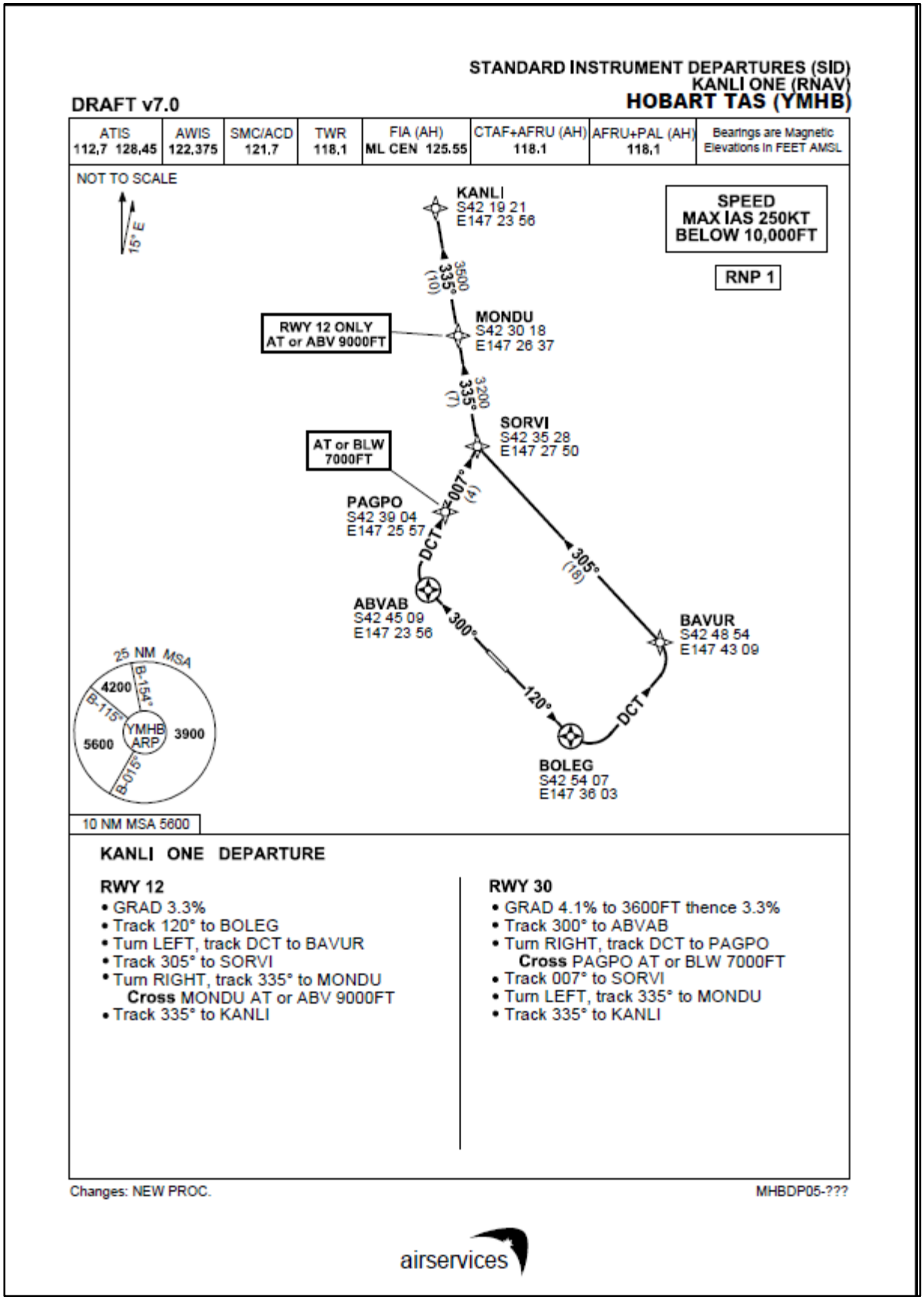
Appendix A Assessment criteria

	N70		N65		N60		LAmax		Leq	
	Day	Night	Day	Night	Day	Night	Day	Night	Day	Night
Urban Residential										
High level (1) of existing flight (increase)	> 25%	> 10%	> 25%	> 10%	> 25%	> 10%	>5dB(A)	>3dB(A)	>2dB(A)	>2dB(A)
Low level (2) of existing flight (total)	10	1	25	2	50	3	>5dB(A)	>3dB(A)	>2dB(A)	>2dB(A)
Rural Residential										
High level (3) of existing flight (increase)	> 25%	> 10%	> 25%	> 10%	> 25%	> 10%	>5dB(A)	>3dB(A)	>2dB(A)	>2dB(A)
Low level (4) of existing flight (total)	7	1	17	1	33	2	>5dB(A)	>3dB(A)	>2dB(A)	>2dB(A)
Sensitive Sites										
Schools (5)	10 / LAeq 35	n/a	25 / LAeq 35	n/a	50 / LAeq 35	n/a	>5dB(A)	n/a	>5dB(A)	n/a
Hospitals (5)	LAeq 30	LAeq 30	LAeq 30	LAeq 30	LAeq 30	LAeq 30	LAeq 30	LAeq 30	LAeq 30	LAeq 30
NES Sites	Case by Case									
Industrial / open spaces / parks (total)	20	n/a	50	n/a	100	n/a				
Population Exposed	Increase or newly exposed	Increase or newly exposed	Increase without decrease in N70 exposure		Increase without decrease in N65 exposure					

Notes
(1) Existing flights exceed 10 at 70dB(A) or 25 @ 65 dB(A) or 50 @ 60 dB(A) (6am to 11pm) or 6 @ 60dB(A) (11pm to 6am)
(2) Existing flights less than 10 at 70dB(A) and 25 @ 65 dB(A) and 50 @ 60 dB(A) (6am to 11pm) and 6 @ 60dB(A) (11pm to 6am)
(3) Existing flights exceed 7 at 70dB(A) or 16 @ 65 dB(A) or 35 @ 60 dB(A) (6am to 11pm) or 6 @ 60dB(A) (11pm to 6am)
(4) Existing flights less than 7 at 70dB(A) and 16 @ 65 dB(A) and 35 @ 60 dB(A) (6am to 11pm) and 6 @ 60dB(A) (11pm to 6am)
(5) Unless noise insulated

Traffic numbers based on 90th percentile busy day
Change in carbon emissions also calculated and a comparison made

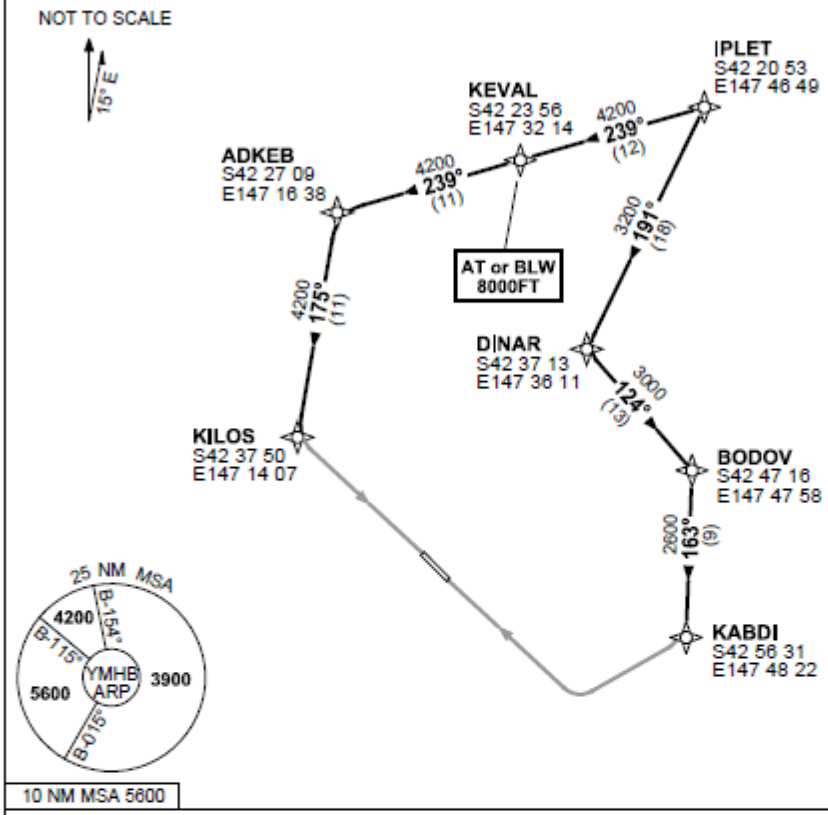
Appendix B Draft DAP Plates



STANDARD ARRIVAL ROUTE (STAR)
IPLET ONE ALPHA ARRIVAL (RNA)
HOBART, TAS (YMHB)

DRAFT v6.0

ATIS	AWIS	SMC/ACD	TWR	FIA (AH)	CTAF+AFRU (AH)	AFRU+PAL (AH)	Bearings are Magnetic
112,7 128,45	122,375	121,7	118,1	ML CEN 125.55	118.1	118,1	Elevations in FEET AMSL



ARRIVAL: IPLET ONE

RWY 30 ALPHA;

- From IPLET track 191° to DINAR
- Turn LEFT, track 124° to BODOV
- Turn RIGHT, track 163° to KABDI
- Track via RNAV-Z (GNSS) to RWY 30

RWY 12 ALPHA;

- From IPLET track 239° to KEVAL **Cross** KEVAL AT or BLW 8000FT
- Track 239° to ADKEB
- Turn LEFT, track 175° to KILOS
- Turn LEFT, track via RNAV-Z (GNSS) RWY 12

COMMUNICATIONS FAILURE: PROCEDURE IN IMC

- Squawk 7600, comply with vertical navigation requirements, but not below MSA.
- Track via the latest STAR clearance to the nominated runway, then fly the most suitable approach in accordance with ERSA EMERG Section 1.5.

Changes: NEW PROC. MHBSR02-???

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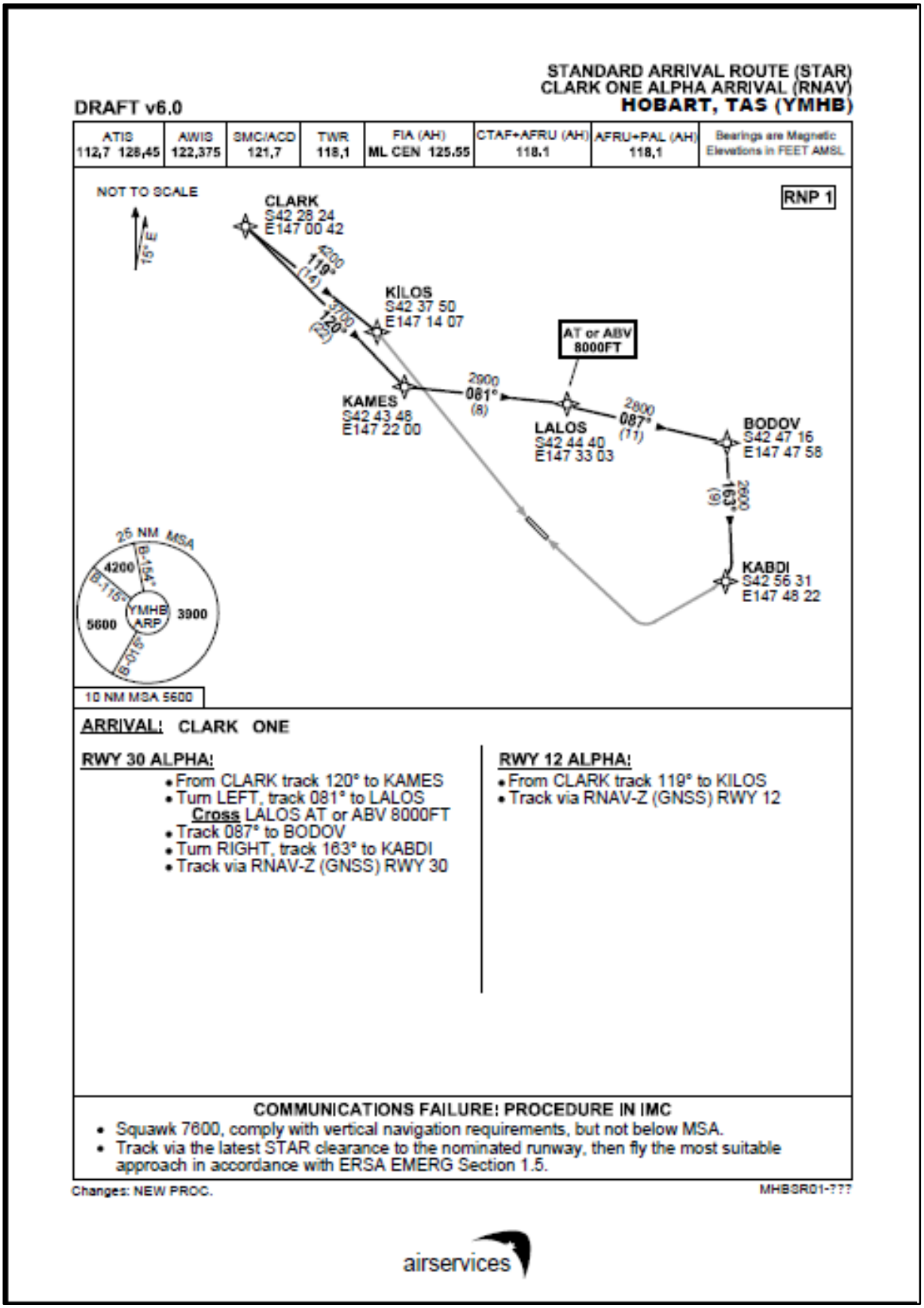

STANDARD ARRIVAL ROUTE (STAR)
CLARK ONE ALPHA ARRIVAL (RNAV)
HOBART, TAS (YMHB)
DRAFT v6.0
ATIS 112,7 128,45
AWIS 122,375
SMC/ACD 121,7
TWR 118,1
FIA (AH) ML CEN 125.55
CTAF+AFRU (AH) 118.1
AFRU+PAL (AH) 118,1
Bearings are Magnetic
Elevations in FEET AMSL
NOT TO SCALE
15° E
RNP 1
CLARK
S42 28 24
E147 00 42
4200
119°
(14)
KILOS
S42 37 50
E147 14 07
3700
120°
(25)
AT or ABV
8000FT
2900
081°
(8)
KAMES
S42 43 48
E147 22 00
LALOS
S42 44 40
E147 33 03
2900
087°
(11)
BODOV
S42 47 16
E147 47 58
2900
163°
(9)
KABDI
S42 56 31
E147 48 22
25 NM MSA
B-154°
4200
B-115°
YMHB
ARP
3900
5600
B-015°
10 NM MSA 5600
ARRIVAL: CLARK ONE
RWY 30 ALPHA:
• From CLARK track 120° to KAMES
• Turn LEFT, track 081° to LALOS
Cross LALOS AT or ABV 8000FT
• Track 087° to BODOV
• Turn RIGHT, track 163° to KABDI
• Track via RNAV-Z (GNSS) RWY 30
RWY 12 ALPHA:
• From CLARK track 119° to KILOS
• Track via RNAV-Z (GNSS) RWY 12
COMMUNICATIONS FAILURE: PROCEDURE IN IMC
• Squawk 7600, comply with vertical navigation requirements, but not below MSA.
• Track via the latest STAR clearance to the nominated runway, then fly the most suitable approach in accordance with ERSA EMERG Section 1.5.
Changes: NEW PROC.
MHBSR01-???
airservices

Appendix C Wind roses – Hobart

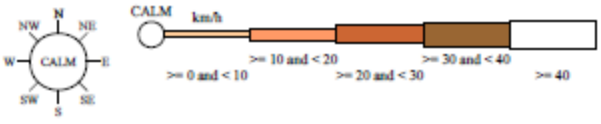
Rose of Wind direction versus Wind speed in km/h (01 Jun 1958 to 05 Apr 2016)

Custom times selected, refer to attached note for details

HOBART AIRPORT

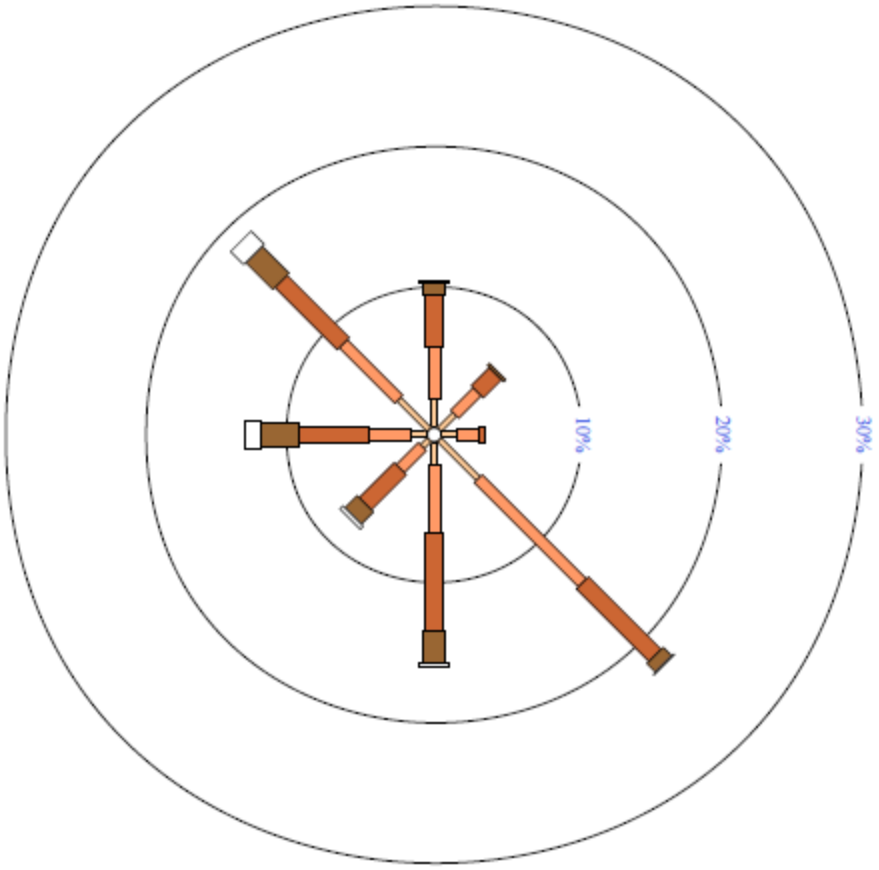
Site No: 094008 • Opened Jan 1958 • Still Open • Latitude: -42.8339° • Longitude: 147.5033° • Elevation 4m

An asterisk (*) indicates that calm is less than 0.5%.
Other important info about this analysis is available in the accompanying notes.



3 pm
20352 Total Observations

Calm 2%



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Rose of Wind direction versus Wind speed in km/h (01 Jun 1958 to 05 Apr 2016)

Custom times selected, refer to attached note for details

HOBART AIRPORT

Site No: 094008 • Opened Jan 1958 • Still Open • Latitude: -42.8339° • Longitude: 147.5033° • Elevation 4m

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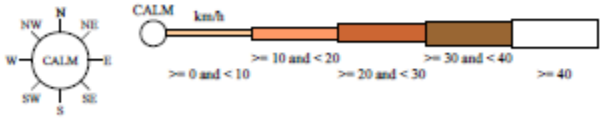
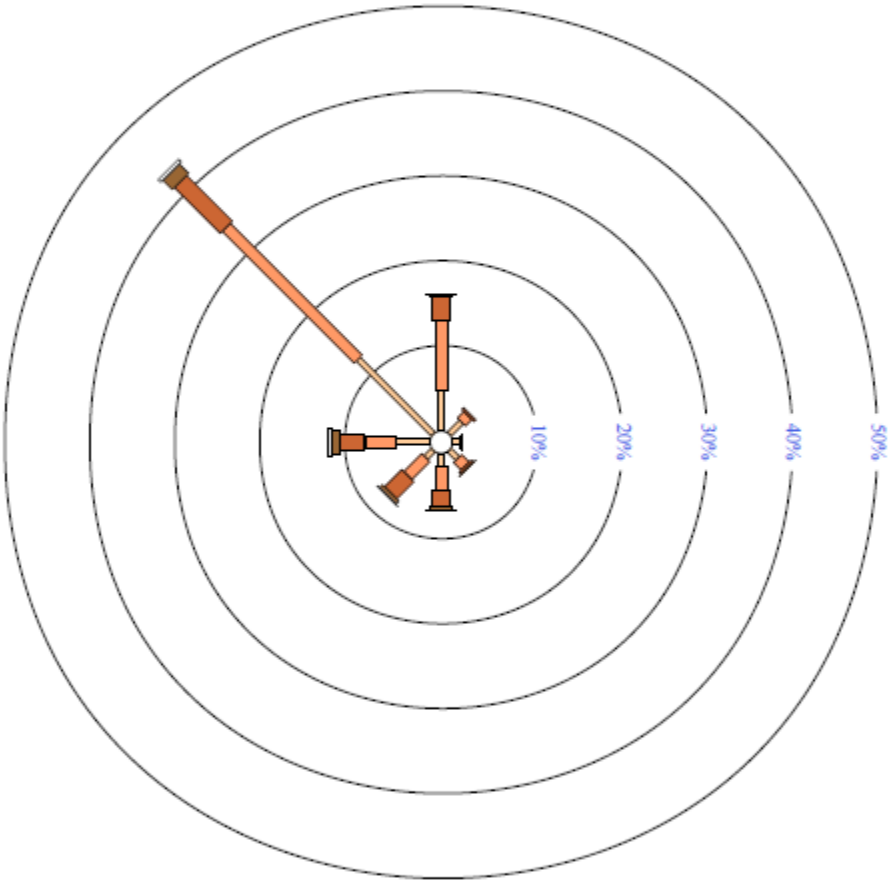


9 am
20354 Total Observations

Calm 7%



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