Australian Government
Civil Aviation Safety Authority

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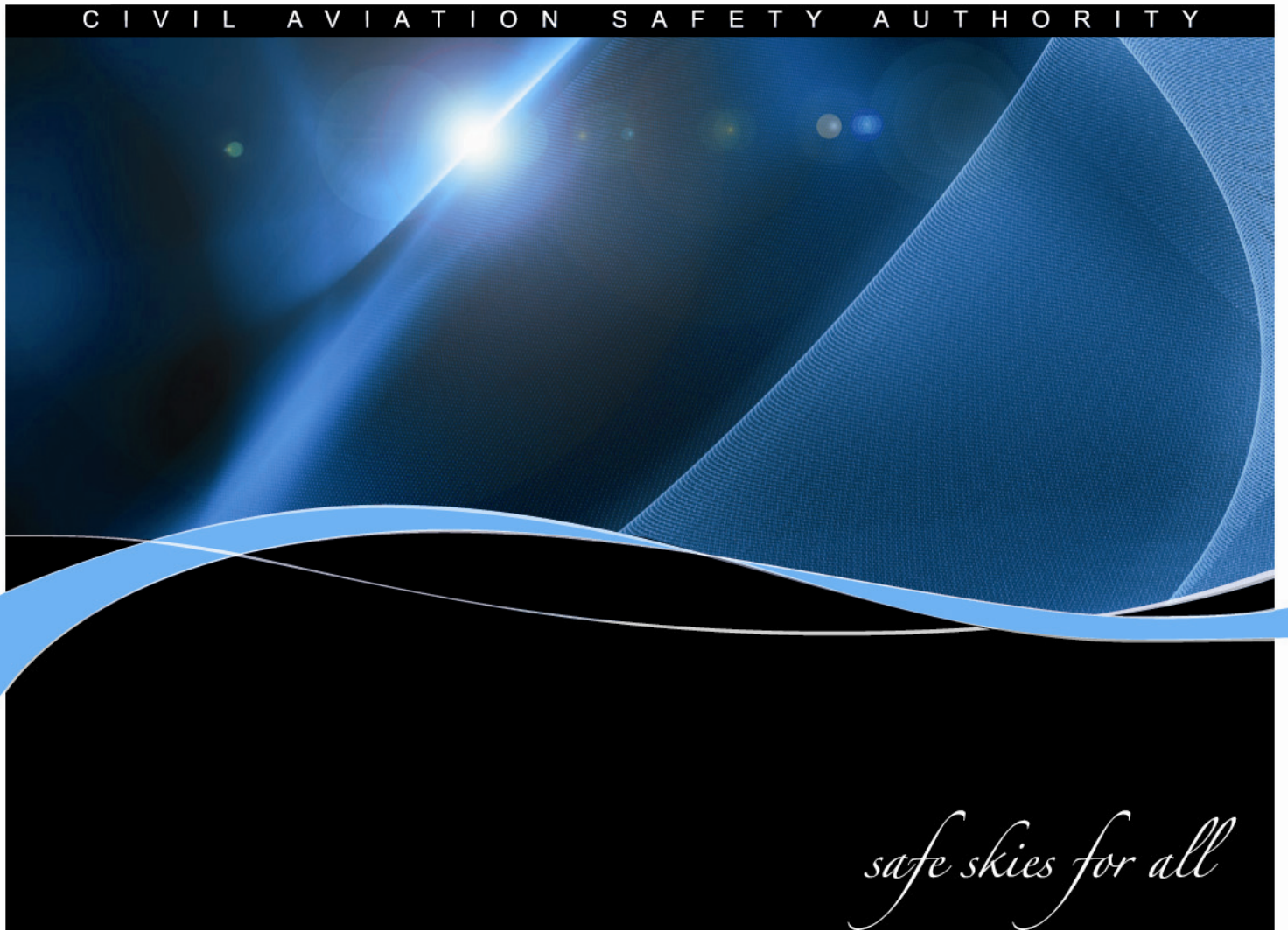
Aeronautical Study of Point Cook

December 2010



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1 Executive Summary

This aeronautical study was commissioned in response to the Government's expectation under the Australian Airspace Policy Statement (AAPS[1]) for the Civil Aviation Safety Authority (CASA) to undertake regular and ongoing studies to meet its obligations under Section 13 of the *Airspace Act 2007* (Act). The Office of Airspace Regulation (OAR) undertakes a risk based approach in determining which locations are studied.

The purpose of the study is to review the airspace classification above Point Cook aerodrome, Victoria (hereafter referred to as Point Cook). Particular emphasis is placed on the safety of Passenger Transport[2] (PT) operations.

1.1 Operational Context

Point Cook is on Port Phillip Bay approximately 17 nautical miles (nm) south west of Tullamarine and 16 nm north east of Avalon. Point Cook was established as a Military airfield in 1913 and was operational until the closure of No 1 Flying Training School in 1993.

The Commonwealth of Australia, represented by the Royal Australian Air Force (RAAF), still owns the Point Cook; however, there are no permanent RAAF flying establishments on Point Cook and no Military controlled airspace associated with it. The Commonwealth has 'Deeds of Agreement for Airfield Use' with approved operators, and access to the airfield is limited to those authorised users of the airfield. Whilst Defence remains as the Aerodrome Operator, Defence contracts Airfield management to a private company; Rehbein AOS.

There are no Regular Public Transport (RPT) operations into Point Cook.

1.2 Issues

The OAR was made aware that movement numbers at Point Cook were in excess of 50,000 per annum. Subsequently, Avdata Pty Ltd was commissioned to record monthly movements for the period May to August 2010. After annualising the recorded data, the OAR concluded that movement numbers at Point Cook were in the order of 80,000 per annum and therefore considered by the OAR to be relatively high.

Accordingly, the OAR deemed it necessary to conduct a review of the aerodrome.

1.3 Findings / Conclusions

The site visit, stakeholder interviews, incident reports and modelling results indicate that current procedures in place at Point Cook are appropriate. In the event that traffic movement numbers substantially increase, or the usage of the aerodrome changes, a further aeronautical study must be considered.

Should charter or other passenger services utilise Point Cook additional air traffic management services must be considered.

[1] A full list of acronyms used within this report can be found at Annex A.

[2] For the purposes of this study, PT services can be defined as activities involving Regular Public Transport (RPT) and all non-freight-only Charter operations.

1.4 Recommendations

It is important to note that the study may make recommendations based on existing and projected data. The following comment as summarised by Chief Justice Sir Harry Gibbs of the High Court of Australia has been considered while conducting the study:

> *Where it is possible to guard against a foreseeable risk which, though perhaps not great, nevertheless cannot be called remote or fanciful, by adopting a means which involves little difficulty or expense, the failure to adopt such means will in general be negligent.*[3]

CASA applies a precautionary approach when conducting aeronautical studies and therefore the following recommendation is made:

1. The OAR should maintain a watch of activity at Point Cook during the bi-annual review of movement data. If total aircraft movements significantly increase, or the mix of aircraft significantly changes, then an aeronautical study should be conducted to reassess the risk to operations.

[3] Gibbs, Chief Justice Sir Harry. *Turner v State of South Australia* (1982). High Court of Australia before Gibbs CJ, Murphy, Brennan, Deane and Dawson JJ.

Contents

2 Introduction

The Office of Airspace Regulation (OAR) within the Civil Aviation Safety Authority (CASA) has carriage of the regulation of Australian-administered airspace, in accordance with section 11 of the *Airspace Act 2007* (Act). Section 12 of the Act requires CASA to foster both the efficient use of Australian-administered airspace and equitable access to that airspace for all users. CASA must also take into account the capacity of Australian-administered airspace to accommodate changes to its use. In exercising its powers and performing its functions, CASA must regard the safety of air navigation as the most important consideration.[4]

Section 3 of the Act states that 'the object of this Act is to ensure that Australian-administered airspace is administered and used safely, taking into account the following matters:

a. protection of the environment;

b. efficient use of that airspace;

c. equitable access to that airspace for all users of that airspace;

d. national security.'

2.1 Overview of Australian Airspace

In line with the International Civil Aviation Organization (ICAO) Annex 11 and as described in the Australian Airspace Policy Statement (AAPS), Australian airspace is classified as Class A, C, D, E and G depending on the level of service required to manage traffic safely and effectively. Class B and F are not currently used in Australia. The classification determines the category of flights permitted and the level of air traffic services (ATS) provided. Annex B provides details of the classes of airspace used in Australia. Within this classification system aerodromes are either controlled (i.e. Class C or Class D) or non-controlled.

Non-controlled aerodromes in Australia are subject to Common Traffic Area Frequency (CTAF) procedures. Pilots of aircraft operating at all registered, certified, Military and CASA designated aerodromes are required to carry and use a Very High Frequency (VHF) radio. Further information about aircraft operations at non-controlled aerodromes can be found on the CASA website:

http://casa.gov.au/wcmswr/_assets/main/pilots/download/nta_booklet.pdf

2.2 Purpose

The study was initiated after the OAR became aware that the Point Cook aerodrome (hereafter referred to as Point Cook) movement numbers were in excess of 50,000 per annum. Subsequently, Avdata Pty Ltd was commissioned to record monthly movements for the period May to August 2010. After annualising the recorded data, the OAR concluded that movement numbers at Point Cook were in the order of 80,000 per annum and therefore considered by the OAR to be relatively high.

[4] Civil Aviation Act 1988, Section 9A – Performance of Functions

The purpose of this aeronautical study is to review the airspace classification above Point Cook and to demonstrate that all sensible and practicable precautions are in place to reduce the risk to "As Low as reasonable Practicable" (ALARP). For this reason a multifaceted approach was used, which included a quantitative and qualitative analysis consisting of:

- Stakeholder interviews,
- Airspace Risk Modelling (relative modelling), and
- Site visits.

2.3 Scope

The scope of the study includes identification and consultation with stakeholders to gather necessary data and information related to airspace issues around the Point Cook aerodrome. As a minimum, this includes consultation with Regular Public Transport (RPT) operators, Charter operators, Flying Training Schools, Defence, Emergency Services operators and the Aerodrome Operator.

The study's scope must also consider CASA's responsibilities in adopting a proactive approach to assess the Australian airspace system and its operations, and to identify and pursue airspace reform opportunities. The AAPS offers clear guidance to CASA on the Government's airspace strategy and policy, as well as processes to be followed when changing the classification or designation of particular volumes of Australian administered airspace.

The scope of this study is not intended to examine aerodrome facilities and infrastructure issues unless any weakness or failings in these areas have a significant impact on the safety of airspace operations in the vicinity of Point Cook.

2.4 Objective

The objective of this study is to examine the airspace around Point Cook to determine the appropriateness of the current airspace classification. This was accomplished by:

a. Investigating, through stakeholder consultation, the appropriateness of the current airspace classification, access issues, instrument approach design[5] issues, expected changes to the current traffic levels and mix of aircraft operations within the existing airspace;
b. Assessing the opportunity to adopt proven international best practice airspace systems adapted to benefit Australia's aviation environment as required by the AAPS[6];
c. Analysis of current traffic levels and mix of aircraft operations within the existing airspace in relation to the level of services provided;
d. Identifying any threats to the operations, focussing as a priority on the safety and protection of Passenger Transport (PT) services;
e. Carrying out a qualitative and quantitative risk assessment of the current airspace environment and the expected impact of any changes;
f. Identifying appropriate and acceptable risk mitigators to the known threats;
g. Reviewing extant Aeronautical Information Publication (AIP) entries for applicability;

[5] Refer to Civil Aviation Safety Regulation (CASR) Manual of Standards (MOS) Part 173.
[6] To view the AAPS (2010) visit http://casa.gov.au/scripts/nc.dll?WCMS:STANDARD::pc=PC_90462

h. Ensuring that the issues are passed onto the relative stakeholder group for their consideration; and

i. Providing assurance to the Executive Manager of the Airspace and Aerodrome Regulation Division of the levels of airspace risk associated with operations at Point Cook.

The OAR issues a review of its Permanent Legislative Instruments on a bi-annual basis. Any changes to airspace determined by this study with respect to airspace classifications, air routes, prohibited, restricted or danger areas will be reflected in these Instruments.

3 Airspace

3.1 Airspace Structure

Point Cook is a non-controlled aerodrome in Class G airspace with a dedicated CTAF. Point Cook is surrounded by Danger Area (DA) D383, which has a vertical dimension of surface (SFC) to Base of Control Area (CTA), and is active during hours of daylight only. See Figure 1.

The airspace abutting Point Cook, or in near proximity, is complex and comprises of:

a. Class C controlled airspace;

b. Class D Control Zone (CTR); and

c. Class E controlled airspace.

Additionally, Restricted Area (RA) R361, which has the dimensions of 3 nautical mile (nm) radius of Point Cook Aerodrome Reference Point (ARP), SFC to Base of CTA. R361 is activated three times per week for museum flying displays and for large events such as the Avalon Air Show and the Point Cook Pageant.

3.2 Airspace Management

The Commonwealth of Australia, represented by the Royal Australian Air Force (RAAF), owns the Point Cook, however, there are no permanent RAAF flying establishments on Point Cook and no Military controlled airspace associated with it.

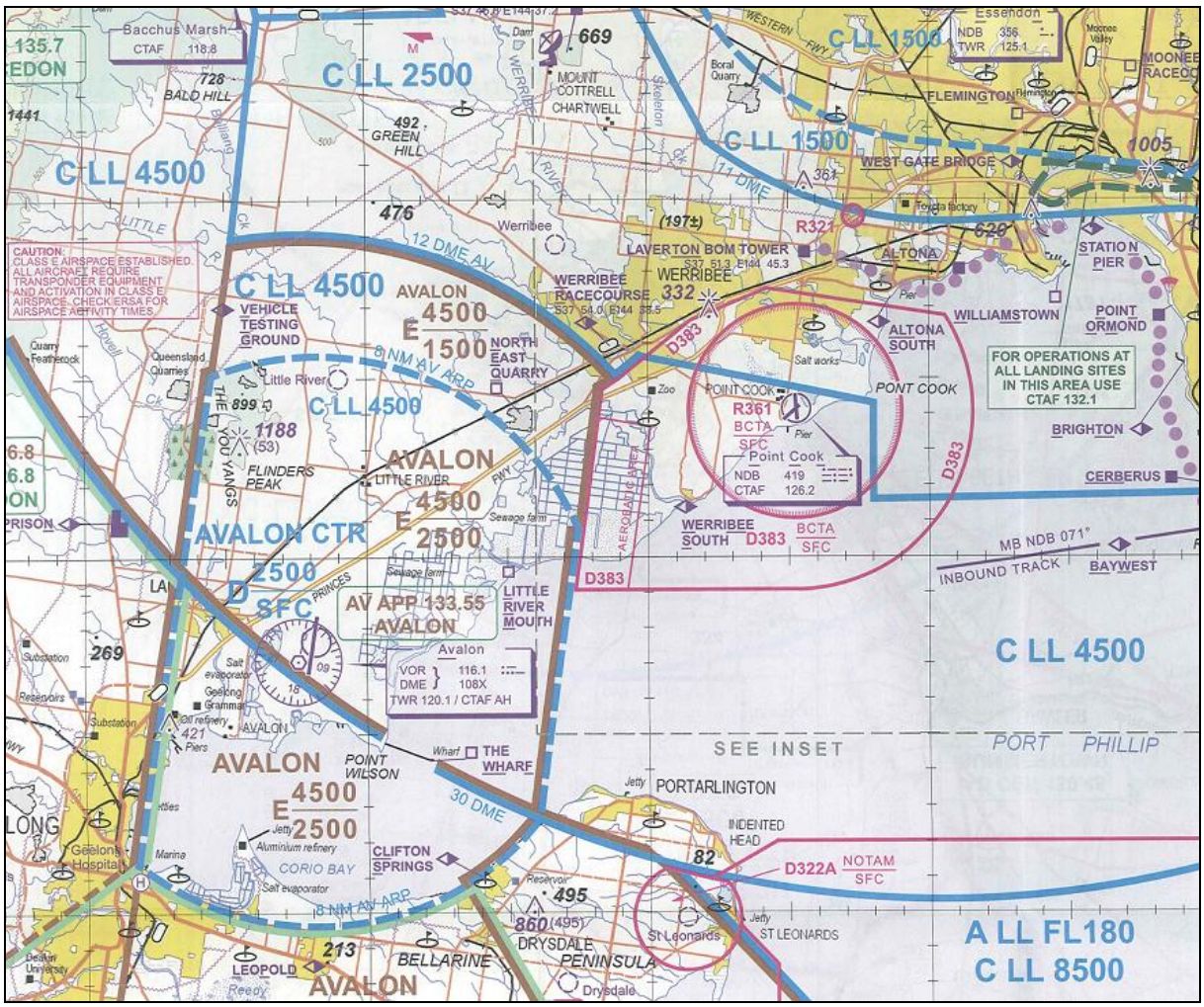

Figure 1: Point Cook (source – Visual Terminal Chart effective June 2011)

4 Aerodrome

4.1 Background

Point Cook was established in 1913 as the nation's first Military airfield and remained as an operational RAAF Base until the closure of No1 Flying Training School in 1993. The Commonwealth of Australia, represented by the RAAF, still owns Point Cook however, there are no permanent RAAF flying establishments on Point Cook and no Military controlled airspace associated with it. The Commonwealth has 'Deeds of Agreement for Airfield Use' with approved operators, and access to the airfield is limited to those authorised users of the airfield. While RAAF remains as the Aerodrome Operator, Defence contracts Airfield management to a private company; Rehbein AOS.

4.2 Aerodrome Location and Layout

Point Cook is on Port Phillip Bay approximately 17nm south west of Tullamarine and 16nm north east of Avalon.

Point Cook has three runways, two asphalt and one grass. Additionally, there is a grass Trike operating area to the east of RWY 17/35. See Figure 2 below.

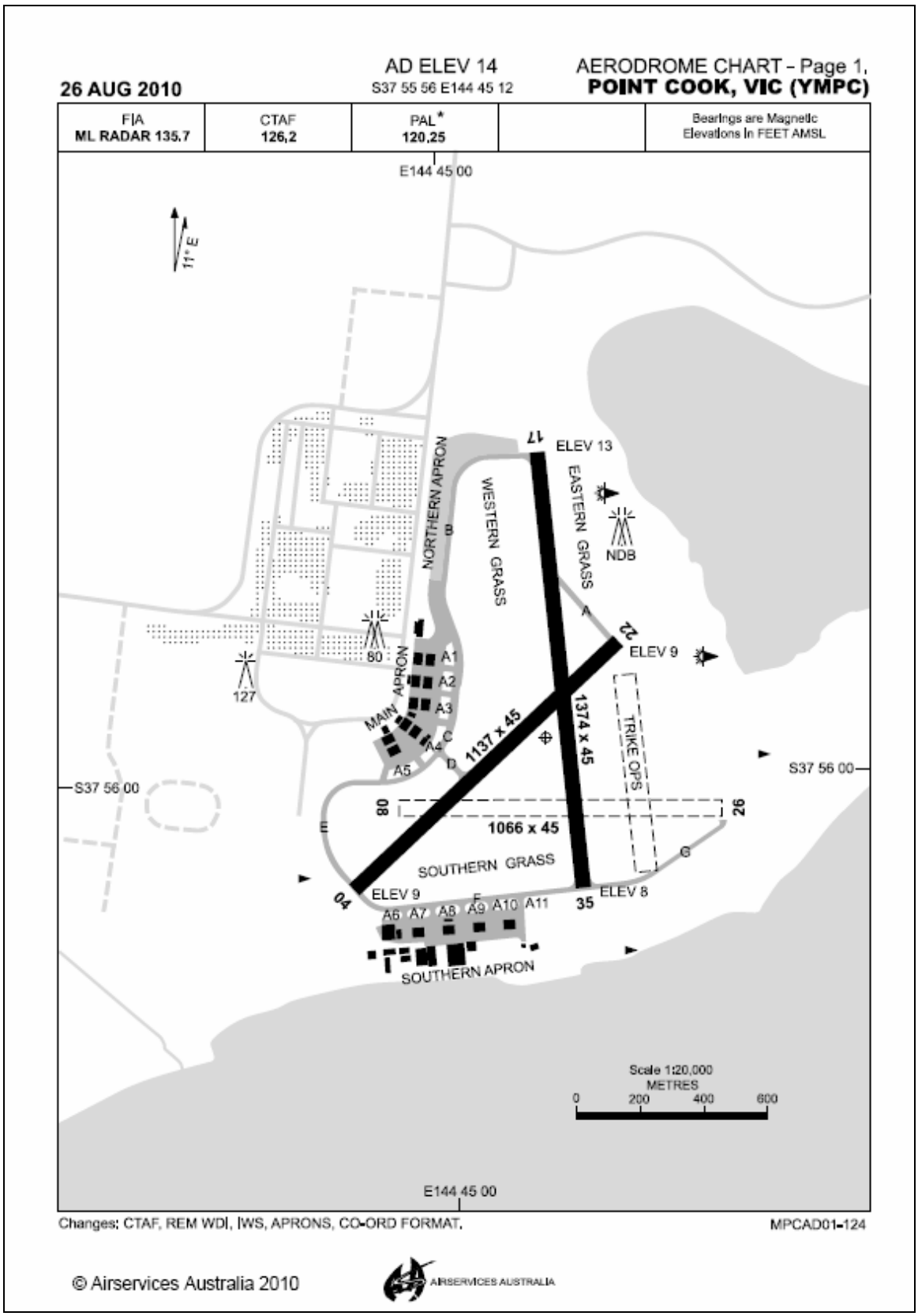

Figure 2: Point Cook Aerodrome Chart (source – Departure and Approach Procedures Aug 2010)

4.3 Airspace Users

There are no RPT or Charter operations into Point Cook. There are 25 authorised users of the airfield, accounting for approximately 82 percent of traffic. The Royal Melbourne Institute of Technology (RMIT), based at Point Cook, is the most significant user of Point Cook, accounting for approximately 65 percent of traffic.

4.4 Review of Aeronautical Information

A review of the Aeronautical Information highlighted an entry in En-route Supplement Australia (ERSA) stating “RAAF Museum conducts flying displays within R361 TUE, THU and SUN 1315-1345 Local Time, within 3nm of the ARP, SFC-3,000FT. Pilots should check NOTAM for activation.”

This RA was established in an effort to provide a level of airspace segregation when the RAAF Museum was conducting flying displays. The RAAF Base Aviation Safety Officers (BASO) were able to show CASA evidence of ‘near misses’ during displays.

ERSA contains significant ‘Local Area Regulations’ which are designed to minimise conflictions in the circuit area. Stakeholders interviewed were satisfied with the ERSA entries and considered the procedures worked well with excellent compliance from local operators.

There were no other issues noted with the Aeronautical Information.

5 Consultation

5.1 CASA

OAR representatives sought input from all authorised users of the airfield and other stakeholders who operate in and around Point Cook. Stakeholder interviews were conducted December 2010.

CASA Flying Operations Inspectors (FOI) from the region were contacted but no issues were identified.

5.2 Aerodrome Operator

The Aerodrome Operator (RAAF) had no issues to report. The Aerodrome Operator contracts day-to-day management of the airfield to the Airfield Manager.

The Aerodrome Operator, through the Airfield Manager, has to approve all flights in and out of Point Cook that are not authorised users of the airfield. The Airfield Manager is notified of the RMIT flying schedule and will halt additional traffic if required to avoid overloading the circuit, however, this is rarely required.

5.3 Passenger Transport (PT) services

There are no PT services into or out of Point Cook.

5.4 Defence

32 Squadron (SQN), based at East Sale, is a regular user of Point Cook and advised the following:

- For a departure from Point Cook, Melbourne ATC is usually very good at identifying aircraft and providing a quick clearance into CTA but, due to its proximity, the potential exists for a Violation of Controlled Airspace (VCA). Therefore, a departure could be improved with a Standard Instrument Departure (SID) that provides appropriate separation from CTA and terrain until cleared into CTA by Melbourne ATC. This may also reduce the incidence of VCAs.

  [CASA Comment: The traffic management for aircraft departing Point Cook is dependent upon the runway in use at Melbourne aerodrome. The current procedures utilised for aircraft departing into CTA involve controllers instructing aircraft to climb to 3,000 ft AMSL. Once the aircraft is identified above Point Cook, tracking information is provided.

CASA cannot find any evidence to support the suggestion that a SID could alleviate potential VCAs. Furthermore, due to the limited amount of traffic departing point Cook into CTA, CASA does not support the creation of a SID at this time.]

- The 32SQN Beech B350 has been changed to a C category performance aircraft. While the 38SQN (based at Townsville) B350 is presently a B category performance aircraft, they are likely to change to a C category performance aircraft soon. As such, changing the Non-directional Beacon (NDB) approach to include C category performance aircraft would greatly assist access into Point Cook.

  [CASA Comment: The Point Cook NBD has since become unserviceable and will not be repaired prior to withdrawal.]

- An Area Navigation (RNAV) approach (designed for at least C category performance aircraft) would also provide an alternative arrival option (as opposed to the NDB) for aircraft trying to fit into a busy circuit pattern or during Instrument Meteorological Conditions (IMC).

  [CASA Comment: An RNAV approach procedure is being designed for Military use only.]

- Increasing/introducing tower hours to facilitate arrival and departure of aircraft during high density traffic periods should be considered.

  [CASA Comment: This Study determined that the type and density of traffic does not warrant a change in ATS or airspace.]

- Occasionally the circuit density is so high that Military aircraft conducting contra circuits can have difficulty fitting into the traffic. Including a procedure to give priority to a Military arrival or departure should be considered.

  [CASA Comment: Point Cook is a non-controlled aerodrome in Class G airspace with a Danger Area declared as a result of the sometime high density of traffic. It is not appropriate to consider a procedure giving priority to the Military.]

- Arriving from the North, in CTA, can leave little time or lateral space to separate from high density traffic. A standard Visual Meteorological Conditions (VMC) arrival procedure that procedurally de-conflicts traffic should be considered.

  [CASA Comment: Point Cook is a non-controlled aerodrome in Class G airspace with a Danger Area declared as a result of the sometime high density of traffic. It is not appropriate to consider a procedure giving priority to the Military.]

- Most Military aircraft (including future acquisitions) should have Airborne Collision Avoidance Systems (ACAS). Mandating the use of a transponder to facilitate the identification of airborne traffic should be considered.

  [CASA Comment: The equipage of avionics in Military aircraft is outside the scope of this Study.]

The BASO is working on a plan to introduce an airspace booking system for the locally based operators in an attempt to de-conflict local traffic.

5.5 Emergency Services

There are no Rescue Fire Fighting (RFF) or Emergency services on Point Cook. Emergency services are provided by local civilian agencies.

5.6 Air Navigation Service Provider (ANSP)

Airservices Australia (Melbourne Terminal Control Unit and Avalon Tower) were consulted and had no issues to note.

5.7 Local Operators

- ***RMIT***

RMIT is the major user of Point Cook and the surrounding airspace—accounting for approximately 65% of the traffic. RMIT programmers 'de-conflict' RMIT operations with other known planned activities. During school holidays, for example, when there are increased flying activities with Air Force Cadets, RMIT will schedule ground school to avoid the circuit area.

RMIT thought the quoted statistics were too high and appear to be statistics for the peak periods such as school holidays. RMIT is limited to 120 students because of infrastructure issues but their number of students during the sample period totalled only 75.

RMIT is using a system in the circuit whereby an aircraft calling base will also call their position in the sequence. This procedure has significantly improved flow and situational awareness. This procedure is described in ERSA.

- ***RAAF Museum***

The Museum pilots expressed minor dissatisfaction with aircraft rejoining cross field when the Museum were conducting contra circuits. To provide additional separation the museum aircraft were flying slightly lower circuits. A planned amendment to ERSA will recommend that rejoining aircraft join the circuit not below 1,500 ft Above Mean Sea Level (AMSL).

- ***Non-Museum Tiger Moth Operations***

The Tiger Moth operators prefer to conduct aerobatics overhead Point Cook because they believe there is less chance of confliction overhead. However, this is problematic when the circuit is active. An agreement was reached between the authorised users of the airfield that aerobatics overhead the airfield would be conducted not below 2,000 ft. Low level aerobatics would be conducted outside 3nm from Point Cook.

A review of the procedure in July 2011 to remain outside the circuit area has changed. The agreement is now that Tiger Moth can do aerobatics within the circuit area provided it remains clear of other aircraft and vacates for aircraft on continuous circuits.

- ***General***

There was consensus from the Stakeholders at the CASA site meeting that the majority of locally implemented procedures, listed in ERSA and designed to minimise conflictions, work extremely well.

The authorised users of the airfield that attended the CASA site meetings were very satisfied with the level of traffic using the Point Cook airspace and did not perceive a need for any increased level of service.

The authorised users of the airfield would also like to see the 2,500 ft AMSL CTA step move towards Laverton to ease congestion for overflying traffic.

[CASA Comment: The area around Point Cook is heavily utilised by ATC to vector Terminal Area traffic arriving and departing out of Essendon and Moorabbin. Airservices has identified the change would infringe the profiles of aircraft on the runway 34 approach and runway 16 departure at Melbourne aerodrome.]

The NDB is going to be de-commissioned and the approach procedure withdrawn from Point Cook within the next two years. This will reduce traffic as civil aircraft will no longer be able to conduct practice approaches at Point Cook. The RAAF is designing a Global Positioning System (GPS) approach for use by Military traffic.

[CASA Comment: The Point Cook NBD has since become unserviceable and will not be repaired prior to withdrawal.]

6 Summary of Incidents and Accidents

6.1 Electronic Safety Incident Reports (ESIRs)

Electronic Safety Incident Reports (ESIRs) are electronically submitted air safety occurrence reports, which form part of the ESIR system, maintained by Airservices, which permits systemic analysis and trend monitoring.

During the period 01 January 2008 to 31 Jan 2011, 12 ESIR reports were recorded by Airservices for incidents in the airspace surrounding Point Cook.

These incidents have been defined by the OAR into the following groups:

Type of Incident	Number of Incidents
Failure to comply with ATS instructions or procedures	0
Airborne Collision Avoidance System (ACAS) Resolution Advisory	1
Go around	0
Runway Incursions	0
Loss of Separation Assurance	0

Table 1: ESIRs at Point Cook 01 Jan 2008 to 31 Jan 2011

The following is a description of the ACAS Resolution Advisory incident:

Traffic had been given to the crew of an IFR DH8B by Melbourne ATC prior to their operations at Point Cook CTAF. The task was to survey the area on a route with east west runs through the CTAF. They were operating 2NM south west of Point Cook when they experienced a Resolution Advisory due to unsighted circuit traffic and climbed to A020 to resolve. Given the proximity of known traffic, the crew demonstrated a level of poor situational awareness to allow the resolution advisory to occur. The four Airspace Incursions dealt with pilot error and poorly flown procedures.

6.2 Aviation Safety Incident Reports (ASIRs)

All accidents and incidents involving Australian registered aircraft, or foreign aircraft in Australian airspace must be reported to the Australian Transport Safety Bureau (ATSB). The ATSB maintains its own database, the Safety Investigation Information Management System (SIIMS), in which all reported occurrences are logged, assessed, classified and recorded. The information contained within SIIMS is dynamic and subject to change based on additional and/or updated data. Each individual report is known as an Aviation Safety Incident Report (ASIR) and for identification purposes is allocated its own serial number.

During the period 01 January 2008 to 31 Jan 2011, 77 ASIRs were submitted to the ATSB for the airspace surrounding Point Cook. The difference between the total ASIRs compared to ESIRs can be attributed to the different search functions associated with the incident data systems.

These incidents have been defined by the OAR into the following groups:

Type of Incident	Number of Incidents
Airprox (A close proximity event between two aircraft)	2
Failure to comply with ATS instructions or procedures	13
ACAS Resolution Advisory	2
Go around	0
Runway Incursions	0
Loss of Separation Assurance	3

Table 2: ASIRs at Point Cook 01 Jan 2008 to 31 Jan 2011

The two Airprox incidents occurred within the Point Cook circuit area and involved light aircraft. It was reported that a following aircraft did not maintain separation with the aircraft in front and an aircraft joining downwind came in close proximity with an aircraft already established in the circuit area. The reports do not indicate if broadcasts were made prior.

The two ACAS incidents involved circuit training at Avalon and local transits from Avalon to Essendon. At Avalon a B737 received an ACAS Resolution Advisory on traffic operating out of the Point Cook CTAF. It was reported that the ACAS traffic was 0.5 nm horizontally and 500 ft vertically below the B737 and non-conflicting. There is insufficient data to determine which aircraft was in error.

The second Resolution Advisory occurred during an approach to Essendon from a Gulfstream IV to an aircraft operating in the Point Cook training area. Separation between the aircraft reduced to 200 ft and 0.5 NM. There is insufficient data on the incident to determine if the Gulfstream IV or the Point Cook aircraft were in error.

The conclusion is that these incidents do not have any significant impact on the evaluation of the airspace associated with Point Cook. However, it is important to note that pilots operating out of Point Cook should be aware of operating procedures when transiting through the Avalon airspace.

6.3 Aviation Safety Occurrence Reports (ASORs)

ASORs are an electronically submitted air safety occurrence report, which forms part of the ASOR system, maintained by Defence. The ASOR system permits systemic analysis and trend monitoring of incidents. This data is also submitted to the ATSB.

During the period 01 January 2008 to 01 Jan 2011, 43 ASORs were recorded by Defence regarding incidents in the airspace surrounding Point Cook.

These incidents have been defined by the OAR into the following groups:

Type of Incident	Number of Incidents
Violation of Controlled Airspace	1
Failure to comply with ATS instructions or procedures	1
ACAS Resolution Advisory	1
Go around	1
Runway Incursions / airside breeches	14
Separation Breakdown	5

Table 3: ASORs at Point Cook 01 Jan 2008 to 31 Jan 2011

The remaining ASORs relate to Maintenance, Environmental and Material issues and are outside the scope of this report. Of the 14 reported Runway Incursions and airside breeches, poor understanding of local procedures were the root cause of the issue. The ACAS Resolution Advisory incident was between a Beech B350 inbound to Point Cook and an unknown VFR aircraft transiting the area that was not transmitting on the CTAF. The five separation breakdown incidents are related to training and experience levels at Point Cook with poor situational awareness being the root cause.

In addition to Table 3, anecdotal evidence (unrecorded) was provided to Victoria Regional Airspace and Procedures Advisory Committee (RAPAC) in late 2010 by the Point Cook museum pilot. The challenges of conducting air show practice with transiting aircraft in the area were described as problematic and a safety concern. A number of near misses (captured in Table 3 as separation breakdowns) relate to both disrupted displays and other incidents between general aviation (GA) aircraft. As a

result, the OAR declared RA R361 on 2 Jun 2011, to be activated for the periods of air show practice, on the basis of safety.

7 Airspace Reform

As required by the AAPS, this study takes into account the Government's requirement that CASA will continue the reform of Australia's airspace and move towards closer alignment with the ICAO system and adoption of international best practice. This includes adopting of proven international airspace systems adapted to benefit Australia's aviation environment. The Government's airspace strategy recognises that international airspace systems include a range of characteristics that should be considered, and implemented as appropriate by CASA.

8 Airspace Risk and other Airspace Matters

Section 3 of the Act states that 'the object of this Act is to ensure that Australian-administered airspace is administered and used safely, taking into account the following matters:

a. protection of the environment;

b. efficient use of that airspace;

c. equitable access to that airspace for all users of that airspace;

d. national security.

This section addresses the requirements of Section 3 of the Act.

8.1 Safety

8.1.1 Modelling Methodology Outline

CASA has developed 'acceptable risk' criteria with regards to the risk of midair conflicts within regional aerodrome terminal areas. The Airspace Risk Model (ARM), developed by CASA in 1996, is focused on a non-radar controlled terminal area model and no significant changes have been made since its development and presentation to the Review of the General Concept of Separation Panel, now the Separation and Airspace Safety Panel of ICAO.

The OAR uses the ARM, which is a cause: consequence model to calculate the probability of midair conflicts in various airspace environments. The ARM and a FN-curve were developed by CASA and are the primary modelling tools utilised by the OAR.

This method is used to calculate benefits in terms of fatalities avoided by implementing safety measures. The ARM presumes that there is a Potential Conflict Pair, i.e. a pair of aircraft whose manoeuvres are such that if no intervening action is taken, the aircraft will reach a point where it will be too late to take evasive action and chance becomes the determining factor in whether the aircraft collide or not. This is known as the Loss of Control point.

The ARM model is based on the Linear Criterion concept which stipulates that the frequency of an accident should be inversely proportional to its severity, i.e. an accident involving at least one fatality may happen ten times as often as an accident involving at least ten fatalities.

Using the ARM, the existing scenario was modelled for Point Cook where CTAF procedures apply.

CASA currently accesses Fast Time Simulation Tools via external means which is costly and deemed unnecessary for Point Cook aerodrome as a review of incidents,

data and feedback from stakeholders indicates that no direct benefit would be achieved from such modelling. Therefore, CASA employed the in house developed regression formula to estimate midair conflicts. The results were further analysed in the ARM.

8.1.2 Airspace Risk Assessment

- ***Assumptions***

The aerodrome is predominantly used for GA operations.

- ***Summary of Movement Data***

For the purpose of this study it was assumed that Point Cook has approximately 80,000 VFR movements and limited IFR movements. In addition, no passengers are recorded for this locality. To confirm this CASA employed a consultancy to record aircraft movements at Point Cook.

Anecdotal information suggests not all aircraft operating from this aerodrome are transponder equipped.

- ***Estimated Traffic Mix***

The aerodrome is predominantly used for GA operations with minimal IFR movements.

8.1.3 Results

The results of the modelling are shown in Figure 3. The results are only representative of the Point Cook airspace and do not include traffic associated in the Avalon airspace.

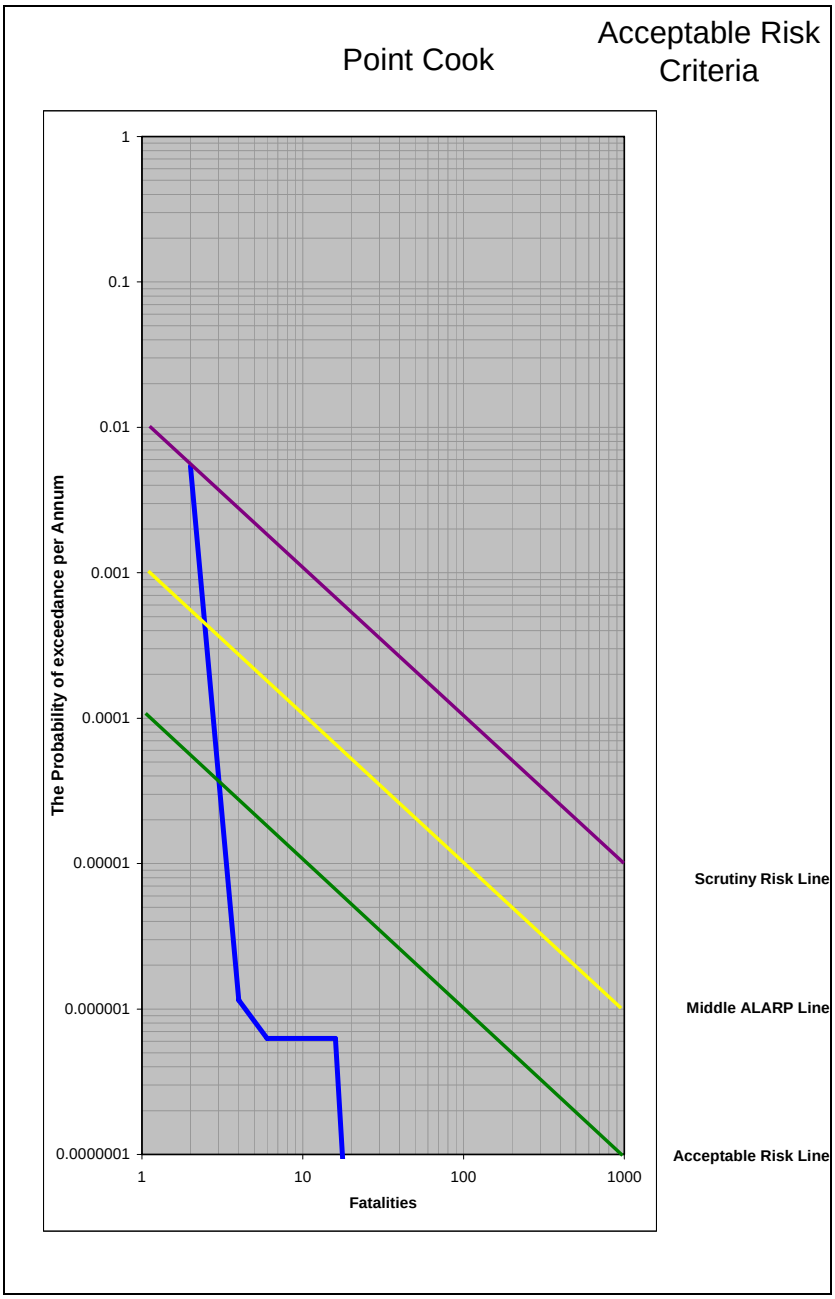

Figure 3: FN Curve for Point Cook with approximately 80,000 movements

The blue line (indicating the probability of a fatality at Point Cook) is close to the Scrutiny Risk Line when displaying the probability of two fatalities; this is an area in which society will tolerate risks that are voluntary. For example, private flying, mountaineering or where the risks involved with occupations that it regards as essential (such as fire fighters and Military personnel) and it is not feasible to reduce risks down to the ALARP. CASA does not expect fare paying passengers to be exposed to this level of risk.

On review of the ARM data, stakeholder feedback, ASIRs, ASORs and ESIRs for Point Cook (see Section 6) it is reasonable to conclude that all reasonable mitigators are in place. Data supporting this conclusion was gathered from Avdata and Airservices Australia.

8.2 Environment

The OAR Environmental Specialist reviewed the Point Cook airspace to examine if there are current aircraft environmental impacts associated with:

- noise
- gaseous emissions
- interactions with birds and wildlife, and
- Environment Protection & Biodiversity Conservation Act 1999 (EPBC Act) issues.

Should an Airspace Change Proposal be lodged that may result in changes in aircraft traffic patterns, the above environment issues will require assessment.

- ***Noise context***

Point Cook aerodrome was established in 1913 and has experienced varying levels of traffic in almost 100 years of existence. The RAAF Museum conducts flying displays 1315–1345 local time Tuesdays, Thursdays and Sundays. For these activities aircraft are requested to avoid low level flying of Point Cook, built up and residential areas. The Museum operations also include low level formation flights of vintage aircraft. Transiting aircraft are requested to overfly Point Cook at a minimum of 2000 feet AGL, weather permitting.

The Royal Melbourne Institute of Technology (RMIT) commenced flying activities at Point Cook in 1995 and this activity has remained relatively constant since it commenced. Peaks and troughs in traffic are experienced due to RMIT course commencement dates and training syllabus requirements.

When operating in the circuit area, RMIT students adopt procedures to minimise aircraft noise, however, over recent years the residential area has encroached on the circuit area. RMIT has investigated changing the active circuit to operate to the west of Point Cook; however, this was not adopted due to the larger number of residents likely to be affected. Circuit training is only permitted on Monday - Saturday, 0730 - 2230 local time

RMIT employs a fly neighbourly policy to attempt to minimise aircraft noise.

- ***Gaseous emissions***

Aircraft fuel use and associated gaseous emissions would not be to be influenced by the current airspace architecture.

- ***Bird and wildlife aircraft interaction and EPBC issues***

Following a review of relevant data, it is reasonable to assume that Point Cook aircraft activity has not been identified as having a significant adverse impact on protected parks and wildlife pursuant to the EPBC Act. The Department of Sustainability, Environment, Water, Population and Communities Protected Matters Search Tool identified 201 items protected under the EPBC Act, none of which would be directly affected by aviation operations at Point Cook.

Point Cook RAAF Base is protected pursuant to the EPBC Act.

8.3 Efficient use of the airspace

The Class G Classification, DA and RA represent an efficient use of the airspace based on current traffic levels.

8.4 Equitable Access

Except for the brief periods of RA activation (approximately 1.5 hours per week), access to the airspace surrounding Point Cook is available to all aircraft.

9 Summary of Issues

The OAR was made aware that movement numbers at Point Cook were in excess of 50,000 per annum. Subsequently, Avdata Pty Ltd was commissioned to record monthly movements for the period May to August 2010. After annualising the recorded data, the OAR concluded that movement numbers at Point Cook were in the order of 80,000 per annum and therefore considered by the OAR to be relatively high.

Accordingly, the OAR deemed it necessary to conduct a review of the aerodrome.

10 Findings and Conclusions

The site visit, stakeholder interviews, incident reports and modelling results indicate that current procedures in place at Point Cook are appropriate. In the event that traffic movement numbers substantially increase, or the usage of the aerodrome changes, a further aeronautical study must be considered.

Should charter or other passenger services utilise Point Cook additional air traffic management services must be considered.

11 CASA Recommendations

CASA applies a precautionary approach when conducting aeronautical studies and therefore the following recommendation is made:

The OAR should maintain a watch of activity at Point Cook during the bi-annual review of movement data. If total aircraft movements significantly increase, or the mix of aircraft significantly changes, then an aeronautical study should be conducted to reassess the risk to operations.

12 References

- ARM, ARC, & VOSL Manual of Airspace Risk Model, Acceptable Risk Criteria, Value of Statistical Life, Internal CASA Document, June 2006.

Annexes:

A. Acronyms
B. Australian Airspace Structure
C. Stakeholder Consultation / Feedback Register

Annex A – Acronyms

Acronym	Explanation
AAPS	Australian Airspace Policy Statement
ACAS	Airborne Collision Advisory System
Act	*Airspace Act 2007*
AI	Airspace Incursion (previously known as Violation of Controlled Airspace)
AIP	Aeronautical Information Publication
Airservices	Airservices Australia
ALARP	As Low As Reasonably Practicable
ARM	Airspace Risk Model
ARP	Aerodrome Reference Point
ASIR	Aviation Safety Incident Report (recorded by ATSB)
ATS	Air Traffic Service
ATSB	Australian Transport Safety Bureau
Avdata	Avdata Australia (aviation movement data provider)
BASO	Base Aviation Safety Officer
CASA	Civil Aviation Safety Authority
CTA	Control Area
CTAF	Common Traffic Advisory Frequency
CTR	Control Zone
DA	Danger Area
Defence	Department of Defence
ERSA	En-Route Supplement Australia
ESIR	Electronic Safety Incident Report (recorded by Airservices)
FN Curve	Frequency / Severity Risk curve
FOI	Flying Operations Inspector
GA	General Aviation
GPS	Global Positioning System (navigation aid)
ICAO	International Civil Aviation Organization
IFR	Instrument Flight Rules
IFR (H)	IFR High – more than 38 passengers
IFR(L)	IFR Low – less than 10 passengers
IFR (M)	IFR Medium – between 10 and 38 passengers
IMC	Instrument Meteorological Conditions
LoC	Loss of Control
NDB	Non-Directional Beacon (navigation aid)
NM	Nautical Miles
NOTAM	Notice to Airmen
OAR	Office of Airspace Regulation
PT	Passenger Transport
RA	Restricted Area
RAAF	Royal Australian Air Force
RAPAC	Regional Airspace and Procedures Advisory Committee
RFF	Rescue and Fire Fighting
RGCSP	Review of the General Concept of Separation Panel (replaced by SASP)
RMIT	Royal Melbourne Institute of Technology
RNAV	Area Navigation
RPT	Regular Public Transport
RWY	Runway
SASP	Separation and Airspace Safety Panel (ICAO)
SFC	Surface
SID	Standard Instrument Departure
SIIMS	Safety Investigation Information Management System
TCAS	Traffic Alert and Collision Avoidance System (a proprietary term used in lieu of ACAS)
TCU	Terminal Control Unit
TWR	Tower
VCA	Violation of Controlled Airspace (also known as an Airspace Incursion)
VFR	Visual Flight Rules
VHF	Very High Frequency
VMC	Visual Meteorological Conditions

Annex B – Australian Airspace Structure

Class	Description	Summary of Services/Procedures/Rules
A	All airspace above Flight Level (FL) 180 (east coast) or FL 245	Instrument Flight Rules (IFR) only. All aircraft require a clearance from Air Traffic Control (ATC) and are separated by ATC. Continuous two-way radio and transponder required. No speed limitation.
B	Not currently used in Australia	
C	In control zones (CTRs) of defined dimensions and control area steps generally associated with controlled aerodromes	▪ All aircraft require a clearance from ATC to enter airspace. All aircraft require continuous two-way radio and transponder. ▪ IFR separated from IFR, Visual Flight Rules (VFR) and Special VFR (SVFR) by ATC with no speed limitation for IFR operations. ▪ VFR receives traffic information on other VFR but are not separated from each other by ATC. SVFR are separated from SVFR when visibility (VIS) is less than Visual Meteorological Conditions (VMC). ▪ VFR and SVFR speed limited to 250 knots (kt) Indicated Air Speed (IAS) below 10,000 feet (ft) Above Mean Sea Level (AMSL)*.
D	Towered locations such as Bankstown, Jandakot, Archerfield, Parafield and Alice Springs.	▪ All aircraft require a clearance from ATC to enter airspace. For VFR flights this may be in an abbreviated form. As in Class C airspace all aircraft are separated on take off and landing. All aircraft require continuous two-way radio and are speed limited to 200 kt IAS at or below 2,500 ft within 4 NM of the primary Class D aerodrome and 250 kt IAS in the remaining Class D airspace. ▪ IFR are separated from IFR, SVFR, and are provided with traffic information on all VFR. ▪ VFR receives traffic on all other aircraft but are not separated by ATC. ▪ SVFR are separated from SVFR when VIS is less than VMC.
E	Controlled airspace not covered in classifications above	▪ All aircraft require continuous two-way radio and transponder. All aircraft are speed limited to 250 kt IAS below 10,000 ft AMSL*, ▪ IFR require a clearance from ATC to enter airspace and are separated from IFR by ATC, and provided with traffic information as far as practicable on VFR. ▪ VFR do not require a clearance from ATC to enter airspace and are provided with a Flight Information Service (FIS). On request and ATC workload permitting, a Radar / ADS-B Information Service (RIS) is available within surveillance coverage.
F	Not currently used in Australia	
G	Non-controlled	▪ Clearance from ATC to enter airspace not required. All aircraft are speed limited to 250 kt IAS below 10,000 ft AMSL*. ▪ IFR require continuous two-way radio and receive a FIS, including traffic information on other IFR. ▪ VFR receive a FIS. On request and ATC workload permitting, a RIS is available within surveillance coverage. VHF radio required above 5,000 ft AMSL and at aerodromes where carriage and use of radio is required.

* Not applicable to Military aircraft.

**If traffic conditions permit, ATC may approve a pilot's request to exceed the 200 kt speed limit to a maximum limit of 250 kt unless the pilot informs ATC a higher minimum speed is required.

Annex C – Stakeholder Consultation / Feedback Register

No.	Stakeholder / Commentator	Reference	Comment	CASA / Consultant response	Action	Response
1	Point Cook Flying Club 17 October 2011 ED11/228332	Aircraft movements	At the time of the of the Traffic study Point Cook Flying Club challenged the view that the Annual Traffic volume at Point Cook was 80,000 movements per annum. There were a number of factual and statistical errors in the study which resulted in the number of movements being a grossly exaggerated number. The definition of movement in the study is not the standard definition employed by Airservices Australia in their reporting of movements at Australian airports. The study has appeared to use the definition of 1 Radio transmission = 1 movement.	At the time, CASA explained that the difference in the movement numbers came from a Touch and Go; Stop and Go being two moves not one. CASA has never considered one radio transmission as being equal to one move. Additionally, the movement study was conducted over a 2 1/2 month period and whilst this may have coincided with school holidays, discussions with RMIT indicate that they will avoid circuit flying during the school holidays due to the increased traffic from the Air Cadets so any 'peak' should have been minimal. Additionally, recent data supplied by the Commanding Officer 21 Squadron supports the veracity of this number.	Explanation sent.	Yes. ED11/228336

2	21 Squadron 17 October 2011 ED11/227466	Section 3.1 - Restricted Area	You may wish to add "and for large events such as the Avalon Air Show and the Point Cook Pageant".	Agreed	Paragraph amended	Yes. ED11/228317
3	21 Squadron 17 October 2011 ED11/227466	Section 5.7	Regarding non-museum Tiger Moth operations. A review of the procedure in July 2011 to remain outside the circuit area has changed. The agreement is now that Tiger Moth can do aerobatics within the circuit area provided it remains clear of other aircraft and vacates for aircraft on continuous circuits.		Paragraph amended	Yes. ED11/228317