出國報告（出國類別：考察）

考察澳洲綠色機場之實務經驗
出國報告

服務機關： 行政院　　交通部民用航空局
姓名職稱： 莊宏司參議　呂宜峰技士

派赴國家： 澳洲
出國期間： 101.5.19-101.5.26
報告日期： 101.08.07

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專責人員電話：	

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目的

一、 有鑑於氣候變遷之衝擊與環保意識抬頭，提高能源效率及降低溫室氣體排放已成爲各國機場施行政策之走向。

二、 澳洲布里斯班(Brisbane Airport, BNE)及坎培拉(Canberra Airport, CBR）機場爲達成永續發展、環境保護及能源效率之提昇，業已訂定相關政策與執行措施，例如：導入環境管理機制（Environmental Management System, EMS)、能源相關管理措施等，爰規劃派員前往考察當地機場之實務經驗。

三、 另規劃考察澳洲基礎建設及運輸部（Australian Department of Infrastructure and Transport）與澳洲空運服務公司(Airservices Australia)，了解相關環保措施作爲的行程與想法。

貳、出國參加人員

行政院交通及環保資源處莊參議宏司及交通部民用航空局航站管理小組呂技士宜峰。另，長榮大學盧教授曉櫻協助先期協調相關拜訪單位之人員、時間及行程規劃，同時協同進行考察期間之相關拜會事宜。

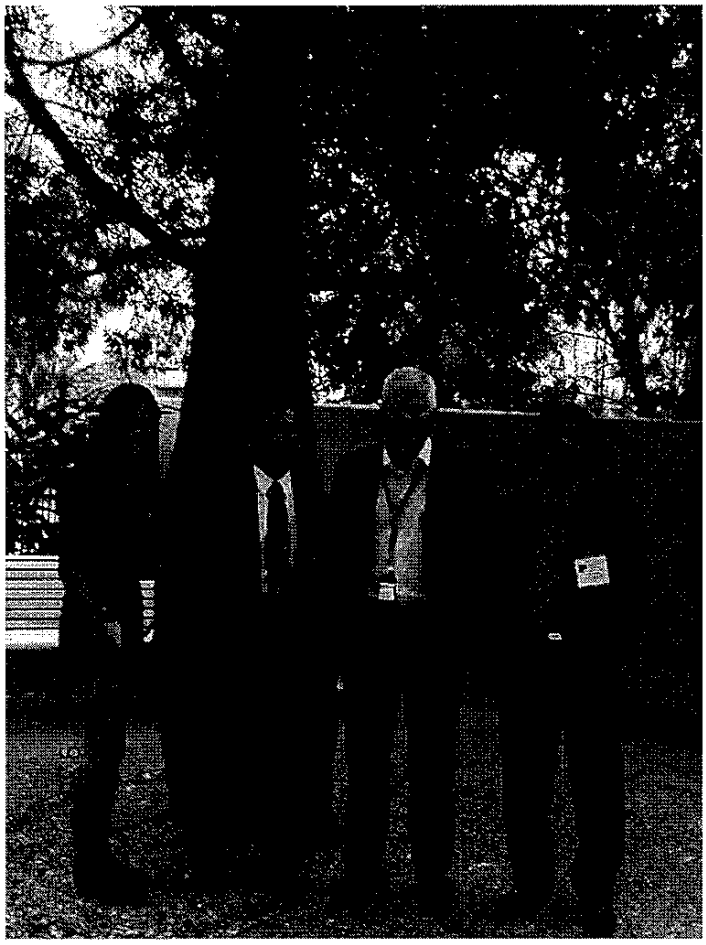

圖 1　考察人員與布里斯班機場公司策略規劃及發展部的負責人 Mark Willey 合影。自左至右分別是盧教授曉櫻（左一）、莊參議宏司（左二）、Mark Willey（右二）、呂技士宜峰（右一）

參、過程

本次執行「考察澳洲綠色機場之實務經驗」出國計畫，自 101 年 5 月 19 日出發，迄 5 月 26 日返國，共計 8 天 7 夜。出席人員共有 3 人，包括；行政院莊參議宏司、民航局呂技士宜峰及長榮大學盧教授曉櫻。參訪行程如表 1：

表 1　澳洲參訪時間、單位與人員

時間	參訪單位	訪問人員
5 月 21 日	布里斯本機場 (Brisbane Airport)	- Mr. Mark Willey, Head of Airport Development, Strategic Planning and Development Department
5 月 22 日	坎培拉機場(Canberra Airport)	- Mr. Noel McCann, Director, Planning and Government Relations - Mr. Zarko Danilov, Project Manager
5 月 23-24 日	澳洲基礎建設與運輸部 (Australian Department of Infrastructure and Transport)	- Mr. Scott Stone, General Manager, Aviation Environment - Mr. Dave Southgate, Head of Aviation Environment Policy Section - Ms Donna Perera, Aviation Policy Advisor - Ms Susan Levett, Head of Airport Infrastructure Regulation
5 月 23 日	澳洲飛航服務公司 (Airservices Australia)	- Mr. Bob Weaver, ….

一、布里斯班機場（Brisbane Airport, BNE）

（一）機場概述

1、布里斯班爲澳洲昆士蘭（Queensland）首府，地處澳洲東岸，約於雪梨北方 1,000 公里處。

2、BNE 係依據 1997 年澳洲聯邦機場法案（Australian Federal Airports Act），成立民營化的機場公司，取得爲期 99 年之租賃合約（49 年+50 年），荷蘭阿姆斯特丹機場（Amsterdam Airport Schiphol）現擁有 19%的股份。機場擁有 2,700 公頃的土地，其中 1,000 公頃保留作爲房地產發展之用（包括大型購物商場）。

3、2011 年的運量有 170,000 架次飛機起降數（其中 15%爲國際航班），預計至 2031 年將提昇至 335,000 架次（增加 97%）。關於旅客數，2011 年約爲 2 千萬，相較於 2001 年僅有 1.25 千萬，10 年中增加了 60%；預計至 2031 年將增爲 4.7 千萬（20 年中增加 135%），其中國際旅客比率將由目前之 21%提昇到 24%。

4、機場之潛在需求區域（開車 1-2 小時距離）約有 3.4 百萬人，其平均所得約爲 1,300 澳幣/週（約合新臺幣 4 萬元）。

5、機場目前有 33 個航空公司進駐營運，其中並無歐洲或北美航空公司。

（二）環境影響

1、BNE 距離人口密集中心有一段距離，離最近之住宅有 6.5 公里，但仍相當接近市中心（僅 12 公里）。然而，目前有房屋建商規劃新住宅區域將位於主要航道下方，此案件目前正於法院審理中。機場強調，如果此建案通過的話，新住戶需在購買房屋之前充分被告知可能受到的噪音問題與影響。但在澳洲，建商並不需事先告知買方任何有關潛在問題，買方需自行負責。

2、機場目前並未有宵禁，但政府將於 2012 年審視評估。機場未有空氣污染問題，主要乃係機隊現代化、運量不多、以及距離人口密集中心有一段距離。

3、噪音爲一重要課題，依據澳洲法令由澳洲飛航服務公司負責噪音監控。

（三）主計畫與環境策略

1、在機場法案下，機場主計畫需每五年更新一次，BNE 的主計畫結構主要爲永續性的四個面相，包括社會、經濟、環境與營運面等。

2、BNE 主計畫說明航空運輸活動、機場場地發展、環境管理與聯外運輸之策略架構，追求整體性發展。此外並提供聯邦、州與地方政府、民間投資者與社區居民等，有關機場未來 20 年之發展趨

勢。在環境章節中，說明有關土地使用規劃、環境影響、地面運輸、噪音與機場營運影響等。

3、在整個機場基礎建設投資計畫中（預算爲 42 億澳幣），長度 3.3 公里的第二條跑道將於 2012-2020 年中興建。此跑道已經在 1983 年的主計畫中提出，由於環境策略之緣故，此跑道之位址已有重大修改，目前規劃是以盡量靠近海邊爲原則。

（四）環保行動方案

1、機場之環境管理系統（Environmental Management System, EMS）遵循 ISO14001 之準則（雖然並未特地進行 ISO 外部認證），確認環境影響源、審視與管理環境風險，參見圖 2 之澳洲機場環境管理架構。

2、依照澳洲政府規定，機場承租商與契約商同樣需負擔其環境管理責任，而 BNE 將其承租商依照其污染程度分爲三類，承租者每年需提報其環境績效予 BNE。近年來，亦針對承租商開設環保管理訓練，使其瞭解機場之環境策略，並設置委員會（Brisbane Airport Tenant’ s Environment Committee）於每季固定開會。

3、在機場聯外運輸部分，已有由小汽車轉爲使用大眾運具之趨勢，主要透過澳洲鐵路經營之 Airtrain 連接機場至市中心，並延長

至黃金海岸。目前已有 10%之旅客使用鐵路運具，希望未來提昇至 25%。但鐵路費率仍相當昂貴，只要有兩人或兩人以上同行，搭乘計程車較爲划算。

4、目前已有完整之腳踏車道，連接機場航廈至商務中心，並連接至州與市區之單車路網。

5、新的管線系統設置已可大量回收使用過廢水，包括市區廢水亦可回收使用。

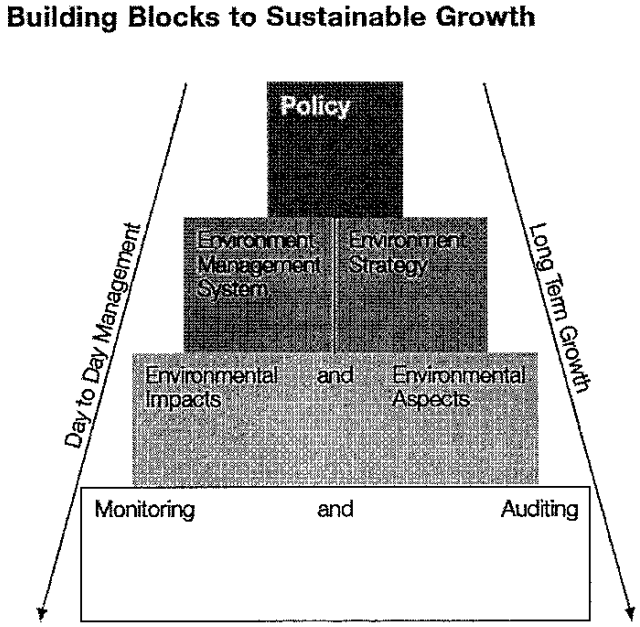

Figure 2.2: Environmental management framework.

圖 2 澳洲機場環境管理架構

（五）與機場週邊住戶溝通

1、機場設置一完整之機場體驗中心（Brisbane Airport Experience

Centre)(圖 3)，提供機場營運與環境影響資訊，可與民眾進行充分之溝通，同時還設有相關的設施可供民眾體驗(圖 4)。惟有關噪音監控與噪音陳情相關案件，則屬於澳洲飛航服務公司負責。

2、澳洲運輸部所研發之計算噪音軟體 Transparent Noise Information Package (TNIP)，以及澳洲飛航服務公司之飛航資訊(Webtrak)，則爲有效之資訊展現平台。

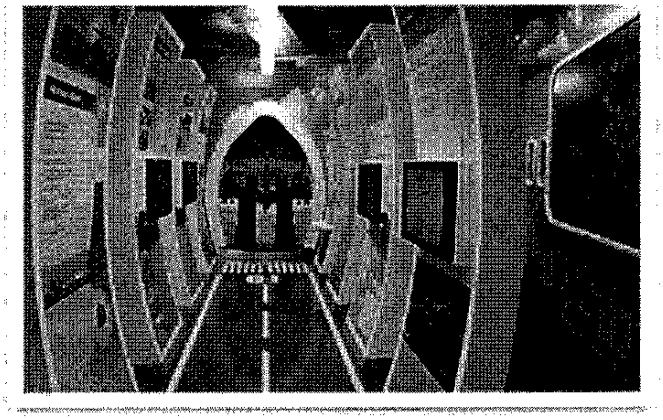

圖 3　布里斯班機場之體驗中心

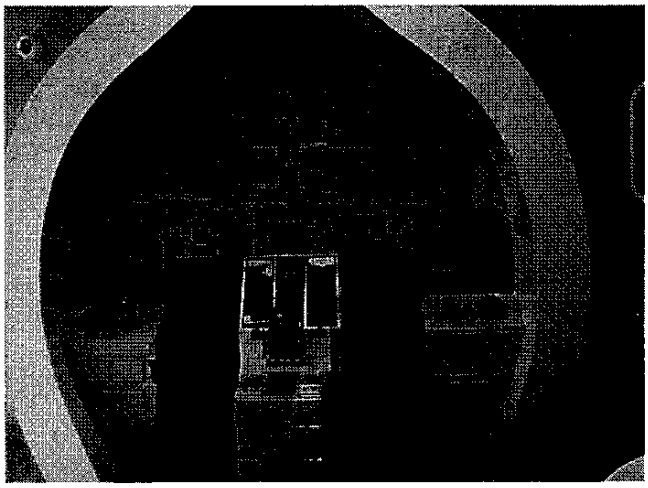

圖 4　布里斯班機場供民眾體驗之模擬駕駛艙

二、坎培拉機場（Canberra Airport, CBR）

（一）機場概述

1、CBR 爲一民營化機場，2011 年客運量約爲 3.2 百萬人次，飛機起降數約 43,000 架次。預計至 2030 年運量將增加至 8.5 百萬旅客數，以及 10 萬架次。

2、機場目前有兩條跑道。

（二）環境影響

1、與其他澳洲機場相同，在機場法案通過後，機場民營化，而且每五年提出發展主計畫（含環境策略）。此項工作並由澳洲運輸部之機場環境官員（Airport Environment Officer）負責監督與管理（機場需負責此環境官員之薪資，以 CBR 爲例，每年需支付

6 萬澳幣，作爲此官員每週工作三天之薪資）。也鑑於此，澳洲機場並未再另行花錢，取得第三方之 ISO 認證。

2、機場目前已規劃精密導航技術降落航道（Required Navigation Performance, RNP），以避開距離機場 10 公里之社區，可惜目前極少數飛機有此設備。目前仍陸續有建商規劃於此社區附近開闢新的建案；在過去 10 年中機場公司已面對 7 件聯邦法院與 2 件新南威爾斯最高法院有關類似之案件。CBR 已規劃高噪音走廊區域（圖 5）爲航道集中區，並避免住宅於此區域內。

3、機場並未有空氣污染議題。噪音陳情則由澳洲飛航服務公司負責處理，平均每月約有 10-12 件陳情案件（今年爲選舉年，噪音陳情件數增加 20 倍！）。

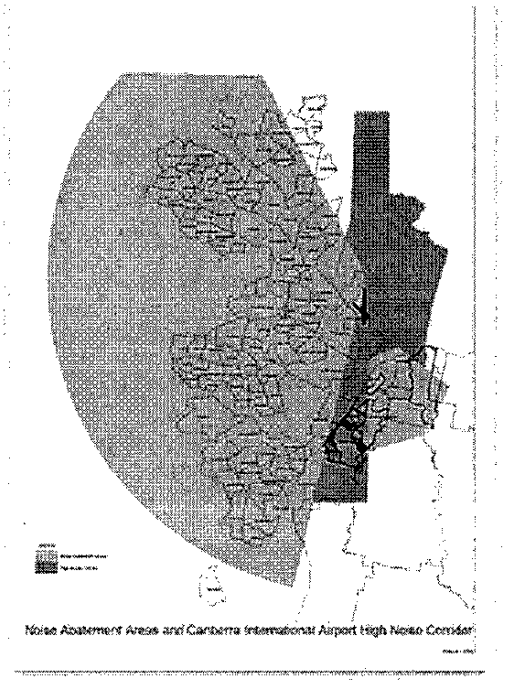

圖 5　坎培拉機場高噪音走廊

（三）綠建築（Green Building）

1、CBR 投注許多精力於綠建築，該公司之建築乃是通過澳洲政府認證之第一個機場綠建築。

2、此綠建築使用汽電冷三項共生（tri-generation）技術，供應機場電力、熱水與冷水，主要燃料來源爲天然氣。此外，所有建築均有雙水管配置，以進行廢水回收使用作業；建築物並使用再生原木。

3、所有機場位址之綠建築由機場公司建造並擁有。機場公司與承租商透過合約與持續性之溝通，確認承租廠商遵循建物使用規範。

4、機場所有員工與承租商在工作中即遵循綠建築使用規範，確認各項工作符合環保要求。機場與承租商需監控其電力、水資源等各項使用狀況，定期檢討改善。

三、澳洲基礎建設與運輸部(Australian Department of Infrastructure and Transport)

（一）澳洲航空環保概述

1、澳洲機場大多無空氣污染議題，因主要機場通常接近海邊；反之，

噪音則爲重要議題。

2、目前有宵禁之機場包括雪梨、阿德雷得（Adelaide）、黃金海岸與 Essendon（舊墨爾本機場），至於布里斯本機場是否宵禁則仍在評估中。

3、已進行機場週邊住宅噪音防制作業僅有雪梨與阿德雷得機場。雪梨機場之噪音防制作業約花費澳幣 5 百萬（平均每戶約澳幣 12 萬，台幣約 360 萬），涵蓋於 65 分貝等噪音線（Ldn）內之住宅。此由政府先行編列預算支付，再透過機場徵收噪音費，反應於乘客票價上收取，當徵收金額足夠時，則不再收取噪音費（雪梨機場已於兩年前完成）。

4、透過噪音防制作業，仍無法解決居民受噪音影響問題，因戶外活動仍是生活的一部份。噪音分散（Noise sharing）目前爲雪梨機場之重要措施與議題，主要乃將航班分散於多條航線，以避免同一區域住戶受到長時間多架次之噪音影響（圖 6）。此外，澳洲首創之噪音指標 N70（指噪音超過 70 分貝之飛航次數）（圖 6），乃爲與民眾溝通之良好工具；並獲得 ACI 建議，現已有全球多個機場採用。

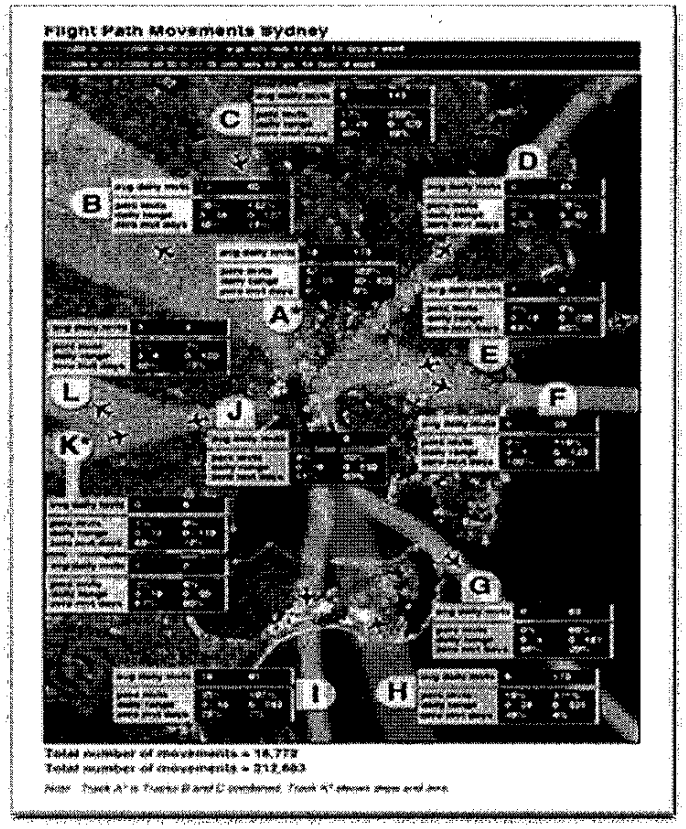

圖 6　雪梨機場之飛航噪音分散比例圖

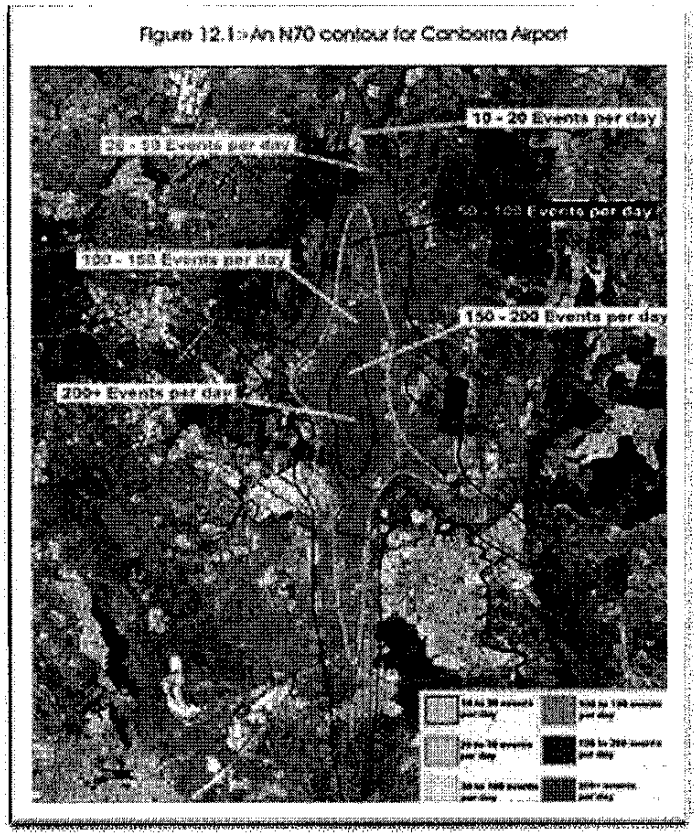

圖 7　坎培拉機場之飛航 N70 等噪音線圖

（二）目前面臨議題

1、最新的飛機操作碳足跡已發行，涵蓋所有澳洲國內與國際航線之起降階段與巡航階段碳排放；但礙於機場施予之壓力，目前暫未公告。

2、在過去 40 年已進行新的雪梨機場規劃，但目前仍未有任何確定進展。

3、運輸部爲保護空域之發展，亦參與高建築物之規劃許可驗證工作。

（三）碳排放

1、澳洲已通過徵收碳稅（carbon tax）之法令，在航空運輸方面將涵蓋國內線架次。大型航空公司樂見其成（雖然他們傾向碳交易），但區域型航空公司則反對，主要乃其他相關措施亦在此時施行。

2、澳洲航空公司針對歐盟碳交易（European Union Emissions Trading Scheme, EU ETS）所可能增加之購碳成本，已於票價加收 3 澳幣（同時其燃油附加費爲 60 澳幣）。預計 EU ETS 將增加年成本 1.3 百萬澳幣；比較其國內之碳稅，其年成本約爲 1.2 億澳幣。

3、有關 EU ETS 議題，澳洲政府亦認同 ICAO 應爲處理此事務之平台，但同時間並不建議其航空公司不加入 EU ETS，因歐盟已規定相關之罰款事項。

4、澳洲代表亞太區域會員參與 ICAO 之市場措施委員會（Market-Based Measures Committee）。此委員會探討碳交易、碳稅以及碳抵銷之議題可行性，預計在聯合國氣候變遷綱要公約（UNFCCC）有任何決定之前，並不可能有任何結果。

（四）機場環境官員（Airport Environment Officers, AEOs）與機場建築控制員（Airport Building Controllers, ABCs）

1、在機場法案下，機場每五年提出包含環境策略之主計畫，規劃未來 20 年之願景（土地使用規劃爲 50 年），每一機場主計畫均由運輸部長批准。

2、機場需負責其周遭區域之古蹟保存與生態保育工作。AEOs 屬政府官員，監督機場確實執行其環境措施，包括遵循污染物排放限制與地面噪音影響等。

3、AEOs 負責全國各地之機場，有時一人需負責超過一個機場，主要依據機場運量與特性，所需投入之人力不同。AEOs 由運輸部聘任，但其薪資則由機場支付。

4、ABCs 的工作爲確認機場建築符合相關管制與規範，包括建設時之環境影響、無障礙設施、工時限制等。ABCs 係由運輸部視需要，透過招標方式委外，而其成本則由機場支付。

肆、心得

一、 澳洲各個機場都是獨立的機場公司，彼此之間都有自己設定的發展計畫與營運目標，良性競爭與定期檢討成效，爲促進澳洲機場公司營運成效卓著的主要因素。拿我國桃園國際機場（股）公司與之相比，顯見單一民營化的機場公司在缺乏內部競爭與外部挑戰的情形下，並不具備有國際級的競爭力。

二、 機場噪音監控與陳情案件處理，均統一由澳洲飛航服務公司負責，如此可以全面性了解各地民眾的需求，且在其整體性的掌控下，可以推出明確的航空噪音應對政策及因地制宜的行動計畫。

三、 許多房地產公司規劃在機場週邊或航道下推出新建案，但機場基於確保長期永續發展與降低噪音影響，透過法律訴訟捍衛機場週邊土地使用。當然，透過政府土地使用規劃管制，以及機場與地方政府有效溝通合作，乃爲較有效率減少機場環境影響且確認機場有足夠腹地之作法。

四、 定期與民眾有效溝通，爲降低機場對環境之影響以及政策推動最有效的工具之一。

五、 本次考察過程中，機場公司在 5 年主計畫中，均以永續性發展爲主軸，統合社會、經濟、環境與營運等 4 大面相，爲一重要之策略。

六、 雪梨機場噪音之分散（Noise sharing）原則，與許多機場之航線噪音集中方式剛好相反，例如法國採用噪音集中（Noise concentration），荷蘭機場在過去則上述方式皆採用過。機場航道設計是否採用分散或集中方式，仍應視實際住宅狀況，在與民眾充分溝通後，採取噪音衝擊最低之作法。

七、 EU ETS 對於航空公司之影響，相較於其他稅收或燃油附加費，轉換成每一乘客成本並不多；而航空公司可利用此機會加速節能減碳之工作，政府則可教育民眾碳足跡之影響。

八、 政府有關碳足跡之相關報告，在產業之壓力下並未公開，此舉似乎在各國皆同。

伍、建議事項

一、 建議定期安排國外綠色機場考察行程，了解國際間在環保與節能減碳方面之精進措施，以作爲我國規劃及發展綠色機場之楷模、借鑑。

二、 綠建築爲國際間建築方面作爲節能減碳的標竿，能夠大幅降低能源的使用，建議未來我國公務部門的新建建物，均以取得國際綠建築 LEED 認證爲目標。

三、 環境管理系統（EMS）爲國際間綠色機場的基本管理系統之一，建議國內相關的國際口岸皆能導入該系統，以作爲建置綠色口岸的基礎架構。

附件

CANBERRA
INTERNATIONAL AIRPORT

MINIMISING THE IMPACT OF AIRCRAFT NOISE

A PROPOSAL BY

CANBERRA INTERNATIONAL AIRPORT

TO

CREATE AN AIRPORT BUFFER ZONE TO QUARANTINE EXCESSIVE AIRCRAFT NOISE INTO CORRIDORS AWAY FROM CANBERRA, QUEANBEYAN, JERRABOMBERRA AND SUB REGIONAL RESIDENTIAL AREAS

NOVEMBER 2002

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MITIGATING AIRCRAFT NOISE

A MESSAGE FROM THE MANAGING DIRECTOR

Owning and managing a vital community asset like Canberra International Airport carries with it special responsibilities particularly for a family business like ours. Like you, we live and work here and enjoy an environment that's the envy of the world. Like you, we are looking at ways to further protect and enhance it.

When we were preparing our Year 2020 Master Plan, the potential for an increase in aircraft noise in residential areas as the airport grew was a significant concern of most of the 44 organisations and local communities that responded to it. That's why we included in it a promise to develop Canberra International Airport sympathetically with the surrounding community and within a framework of responsible environmental planning. This commitment included minimising the impact of aircraft noise in consultation with our key stakeholders.

We are keeping that promise.

First, by our ongoing consultations with the community through the Noise Consultative Group and secondly by our actions. For example, we successfully argued against the development of a residential housing estate known as The Poplars under the airport's main flight path. We are also working with Airservices Australia to further reduce aircraft noise over Canberra's northern suburbs and the NSW areas of Wamboin and The Ridgeway, and we successfully negotiated noise reduction procedures with the owners of three freight companies operating night services into Canberra. Vee H Aviation, Transair and Pelair Express are to be congratulated for responding so positively to this community concern.

Our efforts to minimise the impact of aircraft noise are ongoing. We are currently working on new proposals to develop a noise management strategy on and off Canberra International Airport to further quarantine excessive aircraft noise away from the majority of existing and future residents of Canberra and Queanbeyan. This Regional Plan forms part of our noise management strategy.

So, the purpose of this document is two-fold:

- Better inform the community about aircraft flight paths to and from Canberra International Airport now and in the future; and

- Work cooperatively with governments and the community to ensure that future rezoning of farmland in NSW and the ACT is for land uses compatible with low flying aircraft. We do not believe housing estates now or in the future should be situated under the airport's critical final approach and immediate departure aircraft flight paths.

So, what are we proposing?

We want the Commonwealth, ACT and NSW governments to agree to a Regional Plan that has three zones. Using a traffic light analogy – green, amber and red – these three zones are designed to make it easier for the community to understand the likely impact of aircraft noise at terrain level under aircraft flight paths. For example:

- **Green Zone** – Located within the Canberra and Queanbeyan noise abatement areas, land in this zone is protected from excessive aircraft noise. This zone is suitable for the development of housing estates.

- **Amber Zone** – Land within this zone is overflown by aircraft on approach or departure from Canberra International Airport. However, these aircraft operate at altitudes that are unlikely to produce excessive noise although some people will be disturbed by aircraft noise. The Amber Zone is meant to caution residents on rural estates and village communities within the shires of Yarrowlumla, Gunning, Yass, Mulwaree and the ACT of aircraft movements.

- **Red Zone** – Land within this zone is subject to aircraft noise because of its proximity under existing and future aircraft movements. Because aircraft fly low on approach or departure over this farmland it should not be rezoned for housing estate purposes.

Put simply, we do not support the development of housing estates under aircraft low flying flight paths. We want to avoid the mistakes of Sydney's Kingsford Smith Airport. So, are we heading in the right direction? Your responses are important to us.

We believe our proposal is worthy of your serious consideration. Community consultation is only meaningful if it's two-way. Please read this document carefully, attend our public meeting and give us the benefit of your thoughts and comments by Friday 8 June 2001 by forwarding them to us as follows:

Mail: 2 Brindabella Circuit
Brindabella Business Park
CANBERRA AIRPORT ACT 2609

Fax: (02) 6275 2244
Email: n.mccann@capitalairportgrp.com.au

Stephen Byron
Managing Director

1 THE CANBERRA INTERNATIONAL AIRPORT REGIONAL PLAN

1.1 Aircraft Noise – Some Principles

The Canberra International Airport Regional Plan proposal is based on four principles:

- The community has a right to know the location of aircraft flight paths and the likely impact of noise on those living directly under or close to these flight paths.
- Noise Abatement areas over existing residential suburbs of Canberra and Queanbeyan are important in order to quarantine these communities from excessive aircraft noise.
- Land use planning should be compatible with community concerns about aircraft noise.
- Supporting the development of ongoing new aviation technologies including Precision Global Positioning Approach Systems and the operation of quieter aircraft in line with the noise certification standards of the International Civil Aviation Organisation (ICAO) in order to reduce the impact of aircraft noise.

1.2 Our Proposal

It is proposed that the National Capital Plan, The Territory Plan and the NSW Local Government Environmental Plans for the local government areas of the City of Queanbeyan, Yarrowlumla, Gunning, Yass and Mulwaree Shires be varied to display and describe the "Canberra International Airport Regional Plan." This will require the cooperative agreement of the Commonwealth, ACT and NSW governments.

It is further proposed that the Canberra International Airport Regional Plan should comprise three zones:

- **Green Zone** (refer to plan 1.1)

  This zone which comprises the Canberra/Queanbeyan Noise Abatement Areas is suitable for the development of housing estates. Aircraft, other than light aircraft, are generally required to fly at minimum base heights (1,524m or 5,000ft) over these areas so as to protect residents from excessive aircraft noise. As always, there are infrequent exceptions to the rules (e.g. Defence air shows associated with major events and medical emergencies).

- **Amber Zone** (refer to plan 1.1).

  Aircraft noise experienced within the amber zone is not generally significant, but some people will be disturbed by the noise. Within this zone which encompasses a circle (26km in radius) around the airport, there is no noise abatement of any aircraft type.

  Aircraft on approach to Canberra International Airport enter this zone generally flying at 750 metres above terrain and are on glide descent to final approach to enter the red zone between 615 and 500 metres above the terrain. Aircraft on departure within the amber zone are generally climbing out from the red zone between 1,000 to 1,500 metres above terrain on to higher cruising altitudes.

- **Red Zone** (refer to plans 1.1, 1.2 and 5.21-5.23)

  This zone is where for most people, aircraft noise can, and certainly in the future, will be excessive. Because aircraft fly low over this farmland on approach to or departure from the airport, the land in this zone should not be rezoned for housing estate purposes.

  A practical outcome of the minimum flying heights in the green zone over the Canberra and Queanbeyan Noise Abatement Areas is that aircraft access into and out of Canberra International Airport is restricted to two discrete corridors where aircraft are able to fly considerably lower than over the green zone. One corridor is in alignment with the Main Runway 17/35 and the other with the Cross Runway.

  The effect is to create two canyons of airspace in which all of the aircraft movements at lower altitudes, and consequently the aircraft noise, is concentrated. The Airport runways are at the bottom of the canyon floor. The Noise Abatement Area boundaries form high canyon walls on the sides of this noise corridor which rise up 1,524m (5000ft) to a large plateau which extends over the green zone and where jet aircraft cannot fly below this minimum altitude (plan 5.1.2 is a cross section of Runway 35 approach and 17 departure flight paths between the southern boundary of the Queanbeyan and Canberra Noise Abatement Areas. This plan highlights the likely position of aircraft in comparison to the 1,524m (5,000ft) high walls of the Noise Abatement Area at this point). The two intersecting canyons of air space form our proposed red zone.

1.3 Aircraft Operations in the Red Zone

Aircraft on approach from the north or south to Runway 17/35 generally enter the red zone at a distance between 10 to 16 kilometres from the touch down point and at an altitude of around 615m above terrain. Aircraft on final approach on the Instrument Landing System (**ILS**) adopt a descent glide slope of three degrees from the Church Creek marker (17 kilometres south of Canberra Airport) to touchdown at Canberra International Airport (refer to plan 5.1) via Fernleigh Park, Jerrabomberra Island, the Poplars, Bonshaw and East of Fyshwick.

Aircraft on departure to the south or north (Runway 17/35) within the red zone are on climb to cruising altitudes exiting the red zone between 1,000 to 1,600 metres above terrain. Runway 17 has a noise abatement procedure departure which is over Symonston, Bonshaw and Hume within the ACT and the Poplars, Tralee and Environa farmlands within Queanbeyan via the 180 degree radial.

Aircraft on approach to the cross Runway 30 over East Queanbeyan industrial area and the Molonglo Gorge enter their "final alignment" at various points along the extended runway centre line. Aircraft join the centre line between 4 kilometres (Pialligo Avenue/Oaks Estate road intersection) and 16 kilometres (Wanna Wanna/Radcliffe Estates south of the Captains Flat Road) from the touch down point (refer to plan 5.2.3). The twin turbo-prop airliners used by Kendell (Saab), Qantas (Dash-8) and Impulse (Beechcraft 1900D) flying from cities north of Canberra utilise Runway 30 as a preferred approach. However, when instrument landing is required these aircraft approach on Runway 35 along with larger aircraft from the south. Most airliners have a preferred departure on 17/35, the main north south runway system not the cross runway.

Generally only light aircraft land on Runway 12 from approach over North Canberra and take-off on Runway 30 over North Canberra (refer plan 5.2.2).

PLAN 1.1

PLAN 1.2

2 CONSULTATION PROCESS

2.1 Consultation on Exposure Draft

- Exposure Draft dated 9 December 1999 sent to Dr Andrew Refshauge, Deputy Premier NSW in his capacity as Minister for Planning, Mrs Kate Carnell in her then position as Chief Minister of the ACT and Mr Frank Pangallo, Mayor of the Queanbeyan City Council.

- Consultation on Exposure Draft with 56 major stakeholders – December 1999 to March 2001.

- Public meetings February 2000 with Queanbeyan City Council and Yarrowlumla Shire Council on Exposure Draft.

2.2 Public Consultation on This Draft

- Launch of draft proposal on 11 April 2001.

- Document available on the www.canberraairport.com.au

  Plus distribution to community groups, Noise Consultative Group and major stakeholders.

- Presentation to ACT Government, National Capital Authority, Department of Transport and Regional Services, Department of Urban Affairs and Planning, Queanbeyan City Council and Yarrowlumla Shire Councils.

- Public meetings:

  - Canberra Workers Club 24 May 2001 at 7.30pm
  - Jerrabomberra Community Hall 29 May 2001 at 7.30pm

- Close of public comments COB 8 June 2001

  Email: n.mccann@capitalairportgrp.com.au
  Fax: (02) 6275 2207
  Mail: Box 1, Canberra International Airport ACT 2609

- Review public and major stakeholder comments – 8 June 2001.

- Submission to the Commonwealth, New South Wales and ACT Governments – July 2001.

3 BACKGROUND TO PROPOSAL

3.1 Economic Impact of Canberra International Airport

An economic impact study of Canberra International Airport undertaken by ACIL Consulting in September 1998 found that the airport is a much larger economic entity than most people realise and offers strong impetus for economic growth and consequential business opportunities for Canberra and the Capital Region.

As well as being a key element in the Capital Region's transport infrastructure, Canberra International Airport is important to a number of allied sectors – from regional transport services and the major tourism attractions to support services such as catering, travel consultants and hotels.

A summary of the impacts quantified by ACIL is shown in Table 3.1 and 3.2

Table 3.1 Economic impact of Canberra International Airport

	Direct Impact	**Indirect Impact**	**Total Impact**
Turnover	$361m	$429m	$800m
Value added	$174m	$206m	$380m
Employment	1660 jobs*	2840 jobs	4500 jobs

**N.B the 1660 jobs is bigger than the combined workforce of the ACTEW and ACTION.*
Source: ACIL Consulting

The ACIL study's five and ten year projections on benefits to the Capital Region from the growth of the airport, while cautious, are shown in Tables 3.2.

Table 3.2 Total Economic Impact

	5-year projection		10-year projection	
	2004	% increase from 1998	2009	% increase from 1998
Airport businesses				
Turnover	$1025m	28	$1420m	78
Value added	$450m	18	$650m	71
Employment	5200	16	7575	68

Source: ACIL Consulting

Enactment of the Canberra International Airport Regional Plan in the form of this proposal will enable the Airport to be vibrant in its role as a major economic generator in the Region's economy without the conflict with Residents living under busy and low flying aircraft.

3.2 Recent Developments

Since purchasing Canberra International Airport in May 1998, Capital Airport Group has spent more than $35 million of an ambitious infrastructure program to make the airport a gateway worthy of the nation's capital. This came after an extensive program of public consultation and approval of the Airport's Year 2020 Master Plan by the Deputy Prime Minister and Minister for Transport, John Anderson on 23 August 1999.

The infrastructure program includes:

- Upgrading the terminal building to better serve the travelling community and facilitate the entry of new operators such as Impulse Airlines.
- Construction of new aircraft parking aprons in response to airline demand – the first at Canberra in 28 years.
- Improved car parking and terminal access roads.
- Construction of two new office buildings in the Brindabella Business Park establishing the airport as a technology and aeronautical business hub.
- Development of a new service station with convenience store to serve the travelling public and the airport's growing business community.

Capital Airport Group has in place a four-hub development strategy future for the airport:

1 A passenger hub integrating air, road and future rail services.

2 A Telecommunication and Aerospace business hub to take advantage of the airport's unique position as an economic gateway. Like the major seaports of past centuries, airports in the USA and Australia are attracting new economy business to their precincts.

3 A Transport hub – road and air – fronting Majura Road, the future heavy vehicle bypass of North and south Canberra.

4 An Aviation Education hub. Located at Fairbairn, this campus style college will provide tertiary training for Australia's airline industry.

When Canberra International Airport was privatised in May 1998, there were 379 domestic flights departing to six destinations across the country each week. Around 1.8 million passengers passed through the airport annually. New airline schedules commencing 26 March 2001 total 614 flights per week departing Canberra, an overall growth in frequency of 59%. This is returning a significant dividend to the community in terms of fare savings, airline choice and added frequency of travel.

Aircraft movements at Canberra International Airport during 2000 including Defence, General Aviation and Airlines totalled 156,000. The Airport's Practical Capacity on current technology is calculated at around 285,000 movements annually on or before the year 2050.

The Year 2020 Master Plan forecast passenger numbers to be some 4.4 million in the year 2020. This is compared to some 1.8 million in 1997/98 and 2 million in 1999/2000.

3.3 History of Development at Canberra International Airport

Canberra International Airport has operated at its present site since 1927. Early planning decisions by the National Capital Commission and Queanbeyan City Council located residential areas away from the airport but within 7 kilometres of Canberra's Central Business District, the Parliamentary Triangle and the Queanbeyan Business District. This has contributed to its present status as a convenient and long-term sustainable city airport.

The airport's runway was bitumen sealed in the early 1950s and during 1961 the Instrument Landing System (ILS) was commissioned on Runway 35. Because of general weather conditions – the majority of winds come from the north – Runway 35 from the south is the most used approach. Runway 17/35 was extended during 1973/4 and again in 1980.

The Instrument Landing System enables aircraft to approach the airport in unfavourable weather conditions that may otherwise restrict pilot vision. It requires aircraft to be on final approach by Church Creek, approximately 16 kilometres south of the Runway 35 touch down point. The Church Creek marker is located approximately 6 kilometres east of the Monaro Highway near to the south side of the Royalla Road, NSW. An outer marker is located to the north of Tompsitt Drive within the Poplars. This marker is also used by aircraft on visual approach because operation requirements stipulate that aircraft should be stable on the runway centre line extension 7 kilometres from the touch down point.

During 1973 and 1995 land south of the Queanbeyan Race Course was ceded into the Queanbeyan City Area from Yarrowlumla Shire. The development during the 1980s of housing estates along the Runway 35 extended centre-line on some of this land, south of the Queanbeyan Race Course to Fernleigh Park, will result in some 700 residential houses being located under the main and only instrument approach flight path (Runway 35) to Canberra International Airport. These 700 lots are outside of the Queanbeyan Noise Abatement Area. Subject to their location, aircraft fly between 300 and 520 metres above these houses. The frequency of aircraft movements on this approach has grown and will continue to grow and without improvements in current precision instrument approach technology, these houses will be exposed to excessive aircraft noise.

Plan 5.2.1 indicates the opportunity of a 5 degree offset approach on Runways 35 that moves the approach flight path to the west of these 700 lots. This opportunity may be available when precision GPS technology becomes available into the future.

3.4 Development of Canberra/Queanbeyan Aircraft Noise Abatement Procedures

In response to broad community concerns about aircraft noise over residential suburbs during the early 1990s, Airservices Australia consulted local communities to formulate the current Noise Abatement Areas of Canberra and Queanbeyan.

The formulation of the Noise Abatement Areas in 1995 resulted in most of the previous flight paths being moved to outside of the new Canberra and Queanbeyan Noise

Abatement Areas. Residents situated south of the racecourse and west of the Queanbeyan Noise Abatement Area were then exposed to a concentration of aircraft movements and a greater frequency of aircraft noise on approach or departure.

In response to further concerns from residents, Airservices Australia enacted noise abatement procedures to provide some additional relief. These procedures included:

- After 8.00pm each day the preferred runway approach (weather permitting) to Canberra International Airport is Runway 17, i.e. flying in from the north over the Federal Highway area between the Majura Road intersection and the Sutton interchange. During the first year of monitoring this noise abatement procedure (1998/1999) approximately two out of every three aircraft arrived from the north. The success of this procedure has been assisted by the average weather conditions in the time zone of 8.00pm to 11.00pm when prevailing winds are from the south or south east.

- On departure from Runway 17 (to the south) when aircraft reach approximately 370 metres above the height of the Airport (technically called the ARP) they turn to the west to a 180-degrees (compass) heading. This deviation in flight away from residential areas occurs generally somewhere between the Molonglo River and Canberra Avenue (refer to plan 5.2.1). The 180 degree flight path is via Bonshaw (ACT), passing over the Railway Bridge on the ACT/NSW border on Lanyon Drive. This noise abatement procedure effectively moves the noise of aircraft departing Runway 17 away from the residential communities south of the Queanbeyan Racecourse, to The Poplars, Tralee and Environa farmlands in NSW and Symonston, Bonshaw and the industrial suburb of Hume within the ACT.

3.5 Sub-Regional Planning

The 1998 planning strategy for the ACT and Sub-Region forecasts a regional population of between 450,000 and 500,000 people by 2023. This compares to the present regional population of approximately 350,000 people.

The strategy also identifies two new satellite cities in NSW outside the existing urban centres of Canberra and Queanbeyan that are available for longer-term residential development to a population of around 688,0000 people. These areas are known as Gooromon-Jeir, straddling the Barton Highway north of Belconnen and Gungahlin, and Talagandra-Piccaree, located north of Gungahlin and west of the Sutton Gundaroo Road.

The sub-regional plan of urban areas for Canberra/Queanbeyan forecasts more than 50 years supply of residential land capability at likely population growths.

Neither of the new satellite cities are located within the proposed red zone.

4 LAND WITHIN THE PROPOSED RED ZONE

4.1 Queanbeyan

In October 1999, the Deputy Premier of NSW, Andrew Refshauge, refused to rezone the farm property known as The Poplars to housing estate purposes for the following reasons:

- The site falls directly under Canberra International Airport's flight path and would result in a large number of future residents being significantly affected by aircraft noise.
- The site is not suitable for residential development as proposed by the plan.
- The decision will not restrict Queanbeyan's overall housing development because alternative sites are available to accommodate residential growth within the local government area.
- Canberra International Airport is a major asset contributing to the economic development of the ACT and south-east NSW. The proposed housing would restrict any potential development options for the airport and would not serve the interests of the region.
- As previously noted, the Runway 35ILS outer marker is located within The Poplars, north of Tompsitt Drive.

Farmland similarly located and adjoining The Poplars to the south comprises Tralee, Environa and Jerrabomberra Homestead. These farms are currently zoned "excluded land" in the Queanbeyan Local Environmental Plan. These lands are still under the zoning instrument of the Yarrowlumla Shire applicable at the time the land was ceded into Queanbeyan City. These lands are zoned either rural or rural and environment protection under the applicable Yarrowlumla Shire instrument. The long-term use of NSW government land to the north of The Poplars, between Lanyon Drive and the ACT border, is also still to be resolved, due to the presence of endangered flora and fauna.

Subject to further studies, the Queanbeyan land in the proposed red zone available for urban development is less than 1% of the current urban area of Canberra/Queanbeyan and could be developed for land uses compatible with the approach and departure flight paths, such as industrial estates. The red zone proposal does not limit the residential use of land already rezoned, nor the extension or renewal of existing residential buildings within this zone. However, this proposal informs the public that residents within this Red Zone will be subjected over time to excessive aircraft noise.

The airport has recorded its support for the rezoning and development of housing estates to the east of Jerrabomberra and west of the old Cooma Road south of the Readymix Quarry. This farmland is now within Queanbeyan City, currently zoned rural and or environment protection under the applicable Yarrowlumla Shire instrument. These farmlands are situated within the proposed amber zone. According to recent reports in The Queanbeyan Age the potential residential community of these lands will be greater than Jerrabomberra.

4.2 Yarrowlumla Shire

The Shire of Yarrowlumla has no further rezoning proposals of farmland to smaller rural housing estates within the proposed red zone. However, western parts of the existing Fernleigh Park Estate is located approximately 520 metres under Runway 35 approach and are included in the red zone.

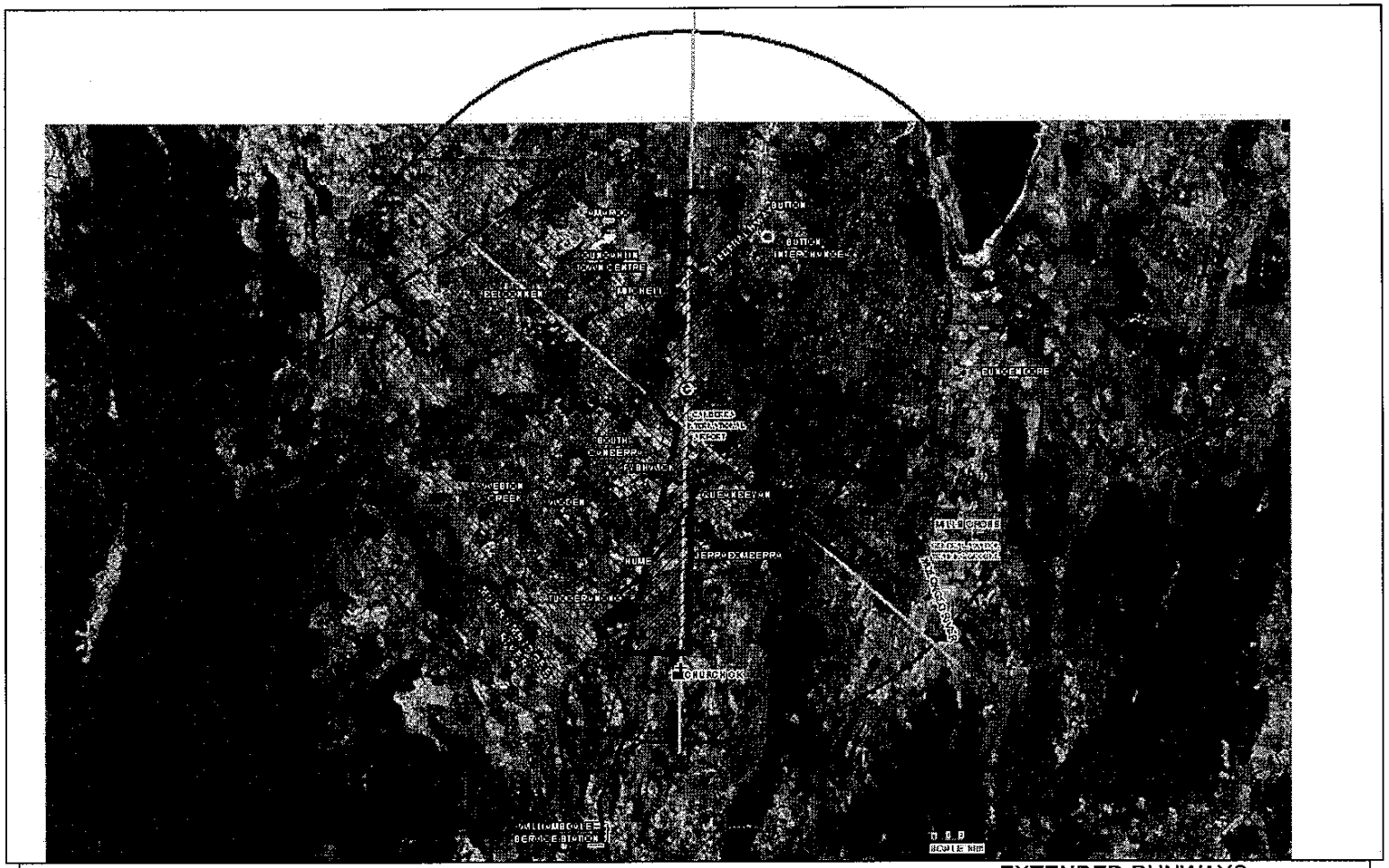
4.3 Australian Capital Territory

On 2 November 2000, ACT Urban Services Minister, Mr Brendan Smyth announced that the ACT Government would not proceed with significant development of the Symonston/Jerrabomberra area within the ACT, south of the airport. This was in response to concerns that the development may have had an adverse impact on the habitats of endangered fauna. The Scoping Study Report stated, among other things, that land use opportunities outside the endangered species habitat included "a commercial /industrial corridor along the Monaro Highway and in areas of high aircraft noise".

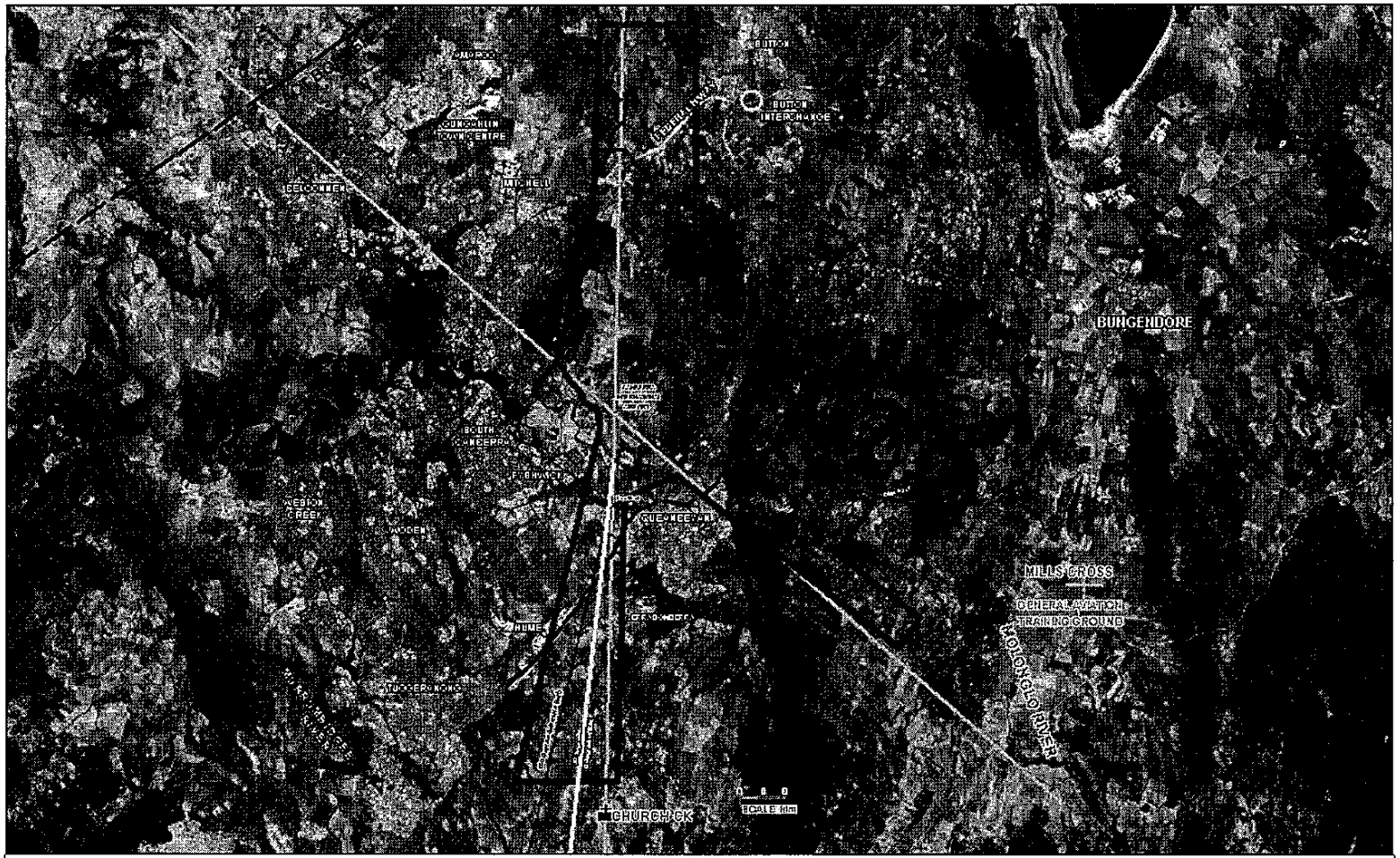
In terms of the land to the north and north west (Majura Valley and Gungahlin) and east (Kowen Forest) of the airport, there are no future housing estate land uses proposed by the ACT Government within the red zone.

The proposed red zone is therefore compatible with future land use planning proposals within the ACT.

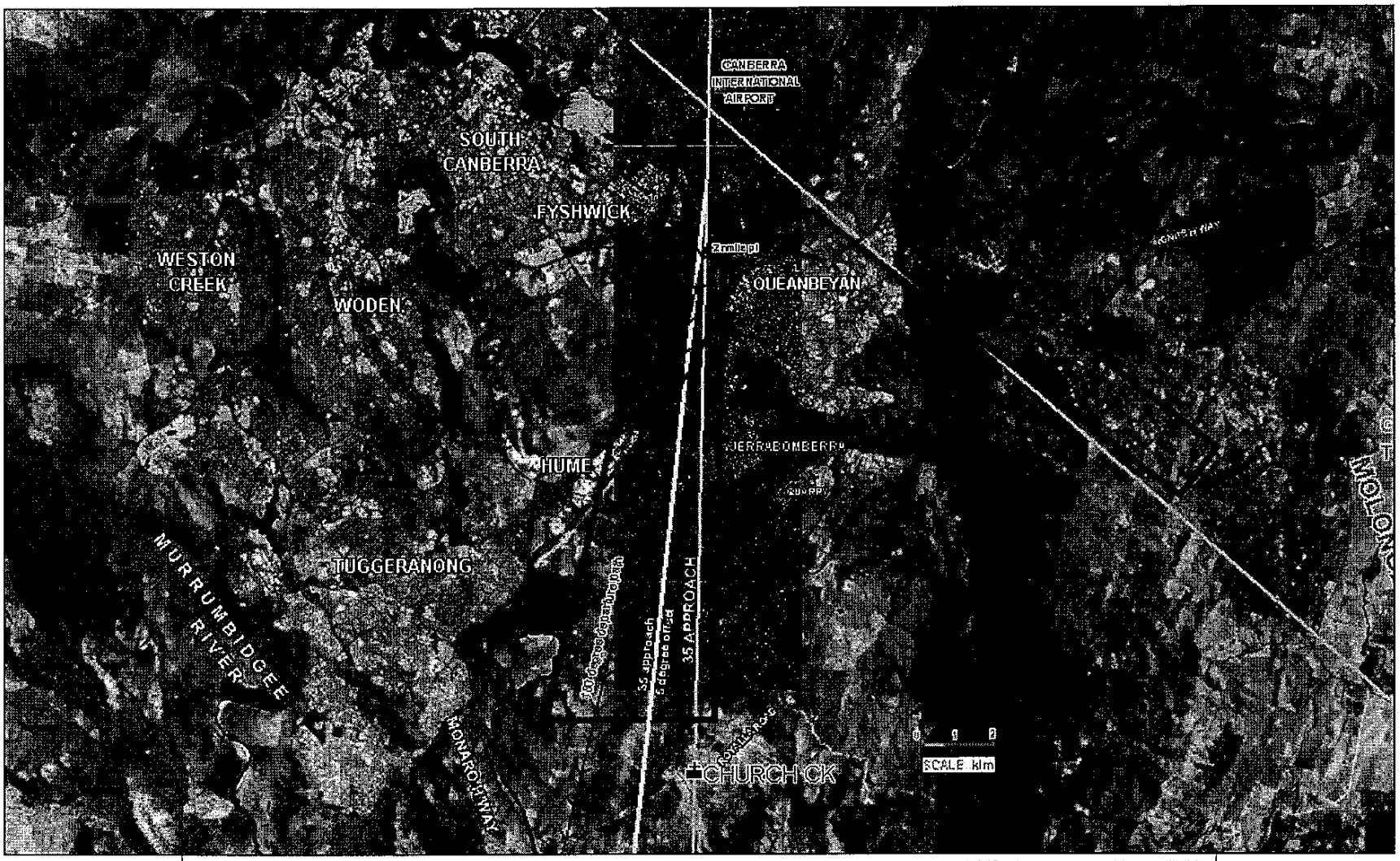
5 PLANS



CANBERRA INTERNATIONAL AIRPORT OPERATIONS PLAN (DRAFT) plan 1.1

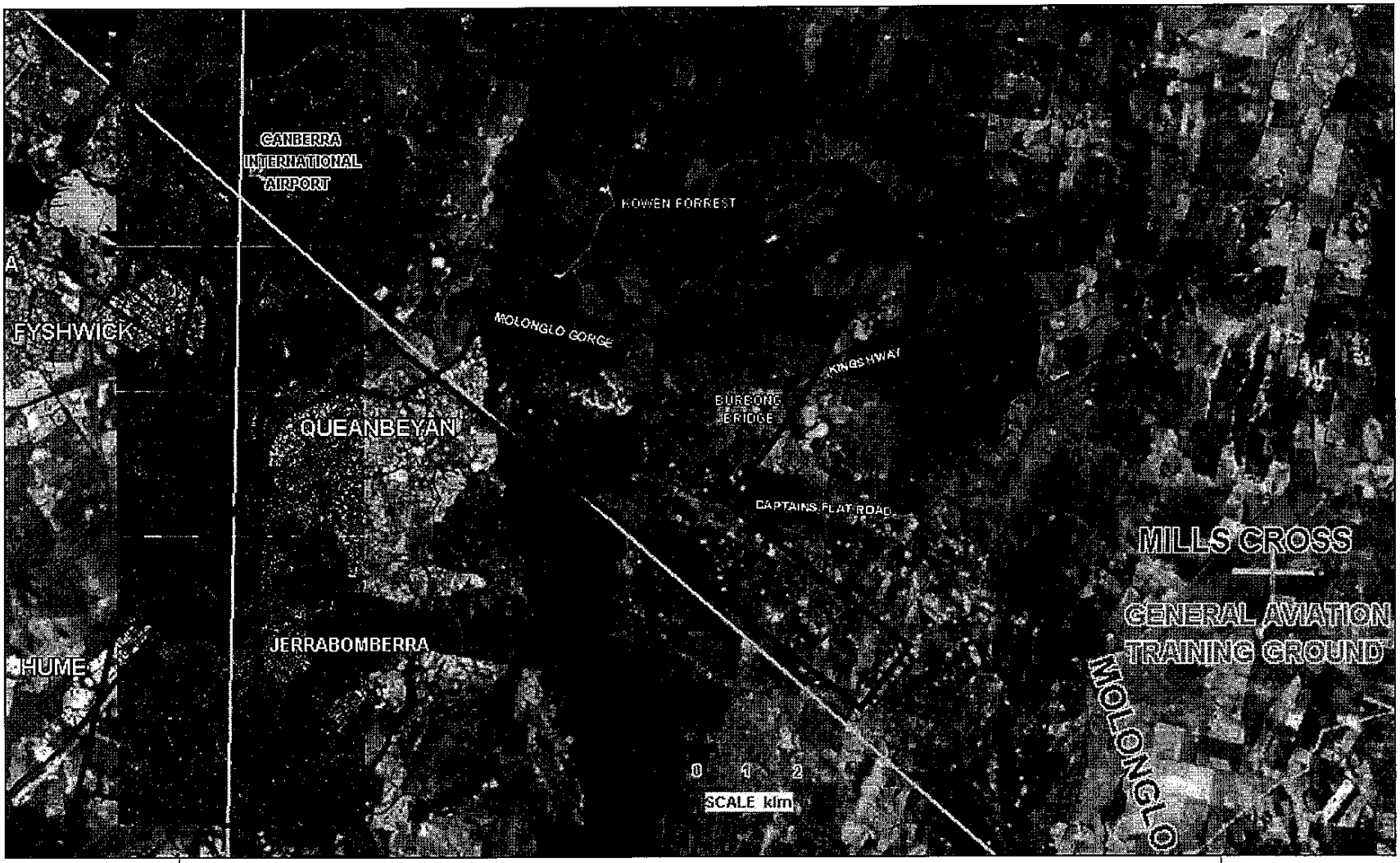


CANBERRA INTERNATIONAL AIRPORT OPERATIONS PLAN – RED ZONE – plan 1.2



CANBERRA INTERNATIONAL AIRPORT OPERATIONS PLAN – RED ZONE – plan 5.2.1

CANBERRA INTERNATIONAL AIRPORT OPERATIONS PLAN – RED ZONE – plan 5.2.2



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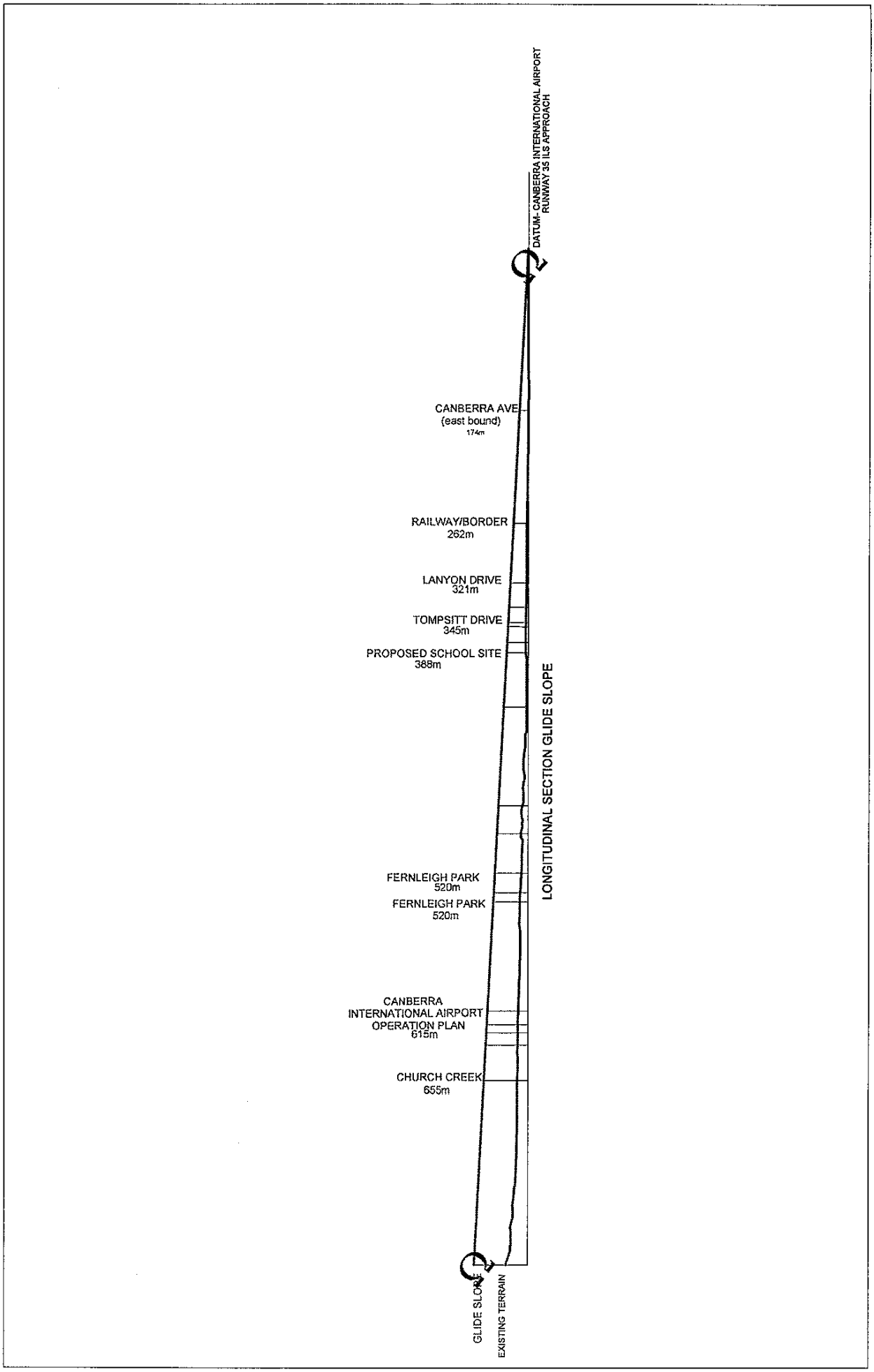
DATUM- CANBERRA INTERNATIONAL AIRPORT
RUNWAY 35 ILS APPROACH
CANBERRA AVE
(east bound)
174m
RAILWAY/BORDER
262m
LANYON DRIVE
321m
TOMPSITT DRIVE
345m
PROPOSED SCHOOL SITE
388m
FERNLEIGH PARK
520m
FERNLEIGH PARK
520m
CANBERRA
INTERNATIONAL AIRPORT
OPERATION PLAN
615m
CHURCH CREEK
655m
LONGITUDINAL SECTION GLIDE SLOPE
GLIDE SLOPE
EXISTING TERRAIN

6 ABBREVIATIONS AND TERMINOLOGY

- **"AGL"** the height above the Aerodrome Reference Point (ARP) a surveying benchmark at Canberra International Airport.
- **"ARP"** the height of the datum point at Canberra International Airport above mean sea level (AMSL), from which the vertical height of aircraft is expressed. The ARP is 1,888 feet AMSL, 575.43 metres.
- **"Capital Region"** NSW Local government Areas of Queanbeyan, Yarrowlumla, Yass, Gunning and Mulwaree and the Australian Capital Territory.
- **"Centre Line Extension"** continuation of Runway Centreline alignment.
- **"DoTRS"** Department of Transport and Regional Services.
- **"GPS"** Global Positioning system utilising satellite technology.
- **"ILS"** The Instrument Landing system enables aircraft to approach the airport without vision e.g. through cloud. It requires aircraft to be on final approach by Church Creek, some 16 kilometres south of the airport. The Church Creek marker (1 of 3 markers) is located approximately 6 kilometres east of the Monaro Highway on the south side of the Royalla Road. The outer marker is situated within the Poplars, just to the north of Tompsitt Drive and the inner marker is located north of the Molonglo river east of Fyshwick.
- **"Light Aircraft"** are helicopters or planes with a Maximum Take Off Weight of not more than 5,700 kg and which are not subject to Noise Abatement.
- **"Local Environmental Plan"** Town Planning documents for NSW local Government areas, managed by each Council.
- **Noise Abatement Area "NAA".** All aircraft over 5,700 kg (MTOW) are required to fly at minimum base altitudes when flying over Noise Abatement Areas (NAA). Jets are required to fly above 1,524 metres (above ARP) and non-jet aircraft above 914 metres (above ARP). The green coloured areas on Plan 5.1 are the Noise Abatement Areas of Canberra and Queanbeyan which have been established by Airservices Australia. The only scheduled passenger aircraft currently operating at Canberra International Airport, which is not noise abated, is the eight-seater aircraft to Albury.
- **Noise Abatement Procedure "NAP"** – action by Airservices Australia's air traffic controllers to direct where and how high aircraft fly to mitigate aircraft noise impact on the community at terrain.
- **"National Capital Plan"** the Principal Strategic Planning document for the Australian Capital Territory administered by the National Capital Authority on behalf of the Commonwealth Parliament.
- **"MTOW"** Maximum Take Off Weight of an aircraft.
- **VOR/DME** – a ground based aircraft navigation aid located in the Majura Valley 1.4 kilometres north of the runway.
- **Runway 17/35** – The main airport runway of some 2,683 metres in length. Runway 17 is the approach from the north and departure to the south. Runway 35 is the approach from the south and departure to the north.

- **Runway 12/30** is commonly referred to as the cross runway and is some 1,679 metres in length. Runway 12 is the approach from the north west over the north Canberra suburb of Campbell and departure to the south east over East Queanbeyan industrial area and ACT lands to the north of the Molonglo River. Runway 30 is the approach from the south east over East Queanbeyan and the Kowen Forest/Molonglo Gorge precinct.
- **"Terrain"** local ground level contour.
- **"Territory Plan"** is the ACT Government's Planning document administered by the Planning and Land Management Group. This Territory Plan is more descriptive, however it cannot be inconsistent with the National Capital Plan.
- **"Canberra International Airport Operation Plan Zones"**
  - **"Green Zone"** Comprises the Canberra/Queanbeyan Noise Abatement Areas, which were designed by Airservices Australia in consultation with the Canberra/Queanbeyan community during 1995 to protect the majority of existing residents from excessive aircraft noise.
  - **"Amber Zone"** This zone has a radius of some 26 kilometres from the Airport's VOR/DME and includes areas not covered by the Red and Green Zones.
  - **"Red Zone"** comprises land within the ACT and the New South Wales Local Government areas of the City of Queanbeyan and Shire of Yarrowlumla that is prone to excessive aircraft noise from low flying aircraft.

APPENDIX A

RED ZONES SURVEY DATA

We describe this zone in surveying terms as having the following boundary.

- Commencing at the intersection of Fairbairn Avenue and Northcott Drive, Campbell, at the centre of the round-about, heading north directly to the Majura Trig @ a bearing of 16006'22" for 5,575 metres.
- From the Mount Majura Trig a bearing north @ 2030' for 9,500m to top of Zone.
- Across the top of the Zone east @ at a bearing of 90000' for 4,206m.
- Then head south at a bearing of 180000' for 13,600m.
- Then turn east @ a bearing of 105015'06" for 9,868 metres within the Kowen Forest at a point intersecting with the radius of 13,077 metres off the airport VOR.
- For 7,940.71 metre arc south until it meets the Kings Highway.
- Then heading easterly parallel with the Queanbeyan Noise Abatement Area boundary @ 1270 58'19" for 4,727 metres to the east end of the Zone.
- Turning square off that bearing to the south to intersect the line projected from the Queanbeyan Noise Abatement Area boundary @ 217058'19" for 1,598 metres across the east end of the Zone.
- Then bearing 3070 58'19" for 12,305 metres heading north west along the alignment of the northern side of the Queanbeyan Noise Abatement Area boundary.
- Then bearing 246013' for 2,557 metres across the north west Queanbeyan Noise Abatement Area boundary.
- Then bearing 181014'58" for 12,489 metres heading south along the alignment of the western Queanbeyan Noise Abatement Area boundary to the southern extents of the Zone.
- Then bearing 270000' for 4,462 metres across the south of Zone to the south/eastern Canberra Noise Abatement Area boundary.
- Then bearing 13017'20" for 15,667 metres heading north along the alignment of the south/eastern Canberra noise abatement area boundary until it meets Pialligo Avenue.
- The boundary then follows Pialligo Avenue north past the airport to the intersection of Fairbairn Avenue.
- The Zone boundary then follows Fairbairn Avenue west back to the starting position at the intersection of Northcott Drive.