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Review of Canberra Airport Preliminary Draft Master Plan and the 'High Noise Corridor' Concept

Report by Access Economics Pty Limited for the

Village Building Co

CONTENTS

GLOSSARY

ABS	Australian Bureau of Statistics
ACT	Australian Capital Territory
ACTPLA	ACT Planning and Land Authority
ANEC	Australian Noise Exposure Concept
ANEF	Australian Noise Exposure Forecast
ANEI	Australian Noise Exposure Index
AQIS	Australian Quarantine and Inspection Service
AS	Australian Standard
CBA	Cost Benefit Analysis
CIA	Canberra International Airport
COAG	Council of Australian Governments
BITRE	Bureau of Infrastructure Transport and Regional Economics (a DoTaRS agency)
DITRDLG	Commonwealth Department of Infrastructure, Transport, Regional Development and Local Government
GA	General Aviation
NPV	Net Present Value
PDMP	Preliminary Draft Master Plan
PUC	Practical Ultimate Capacity
RNP	Required Navigation Performance
RPT	Regular Public Transport (commercial aircraft)
VIP	Aircraft carrying Very Important Persons (eg foreign dignitaries)

SUMMARY

Canberra International Airport has released a Preliminary Draft Master Plan (PDMP, February 2009) for public comment. Key deficiencies in the PDMP include:

- The revised PDMP does not adequately address the reasons why the Minister for Infrastructure, Transport, Regional Development and Local Government rejected the previous draft master plan last year. It lacks detail and has many inconsistencies.
- The noise contours in the PDMP are inconsistent with the air traffic forecasts in the PDMP and are based on many more larger noisier jet aircraft. The noise contours also assume that noisier out-of-production aircraft will still be operating after 2050 and do not allow for recent and expected future technological improvements in the acoustic performance of aircraft.
- The noise contours in the PDMP relate to the traffic expected 'between 2050 and 2060'. This wide and distant timeframe is not suitably accurate to inform land use and planning decisions. The distant timeframe also reduces accountability – the noise forecast by the airport cannot be compared against actual outcomes until after 2050. ANEF contours for a specific year, eg 2029/30 – and consistent with the traffic forecasts in the PDMP – would better inform land use and planning decisions, and enhance accountability.
- The airport has advised that they have not undertaken economic analysis or costings to support the projections for night freight operations or that a freight hub will results in lower emissions. The master plan assumes the number freighter jets per night will be 5 in 5 years and 15 in 20 years, resulting in 30 movements at night. This is inconsistent with the noise contours in the master plan which assume 56 freighter jet movements per night including 4 jumbo jet movements. Canberra Airport's projections appear unachievable when compared to Sydney which has 20 freight flights per day.
- Canberra Airport has existing (and proposes additional) child care centres within ANEF 30, which has unacceptable levels of aircraft noise according to the Australian Standard (AS-2021-2000). Children in child care within ANEF 30 on-airport should be receiving the same standard of care (as specified in AS-2021-2000) as children in child care off-airport. The proposed development at Tralee is compatible with AS-2021-2000. The airport is also proposing a hotel/motel and other public buildings within ANEF 30 which has unacceptable levels of aircraft noise.
- For land use and planning decisions, a 'High Noise Corridor' concept is proposed by Canberra Airport in place of the current Australian Standard (AS-2021-2000, which uses the ANEF concept). The 'High Noise Corridor' concept was created by Canberra Airport, is not in common use around Australia and is not based on any science. The current Australian Standard is based on decades of scientific and socioeconomic research.
- The noise contours in the PDMP rely on closing down the general aviation industry at Canberra Airport. Rather, Canberra's GA industry should be protected with a ring fence of 50,000 movements per annum until a suitable alternative GA aerodrome can be developed in close proximity to Canberra. The PDMP and associated noise contours should reflect this GA ring fence until a suitable alternative aerodrome can be established for the GA industry.
- Due to the substantial changes in the plans for the airport since the runway extension was approved, a fresh Environmental Impact Statement should be prepared before allowing the relocation of the southern runway threshold 450m further to the south.

PART 1: REVIEW OF PDMP

Introduction

The Village Building Co commissioned Access Economics to peer review the Canberra International Airport (CIA) Preliminary Draft Master Plan (PDMP) and the use of the Practical Ultimate Capacity (PUC) concept to generate an Australian Noise Exposure Forecast (ANEF), which in turn is loosely extrapolated into a 'High Noise Corridor'. Part 1 of this review examines the PDMP and Part 2 reviews the PUC traffic assumptions and the 'High Noise Corridor' concept.

Airport traffic – inconsistencies between the 2007 ANEF and the 2009 PDMP

The *Airports Act 1996* stipulates a master planning period of 20 years in s72 and the requirement to produce an ANEF in s71(2)(d). Taken together, this suggests the ANEF should relate to the 20 year planning period (namely 2029/30) rather than the wide and distant timeframe used in the PDMP, where the traffic underpinning the ANEF is reached 'between 2050 and 2060'. A timeframe of four to five decades into the future is not a suitably accurate basis for planning and land use decisions.

Furthermore, the assumptions, business plans and forecasts in the CIA 2009 PDMP are no longer consistent with the assumptions, business plans and forecasts that underpin the 2007 ANEF developed by Rehbein-AOS.[1] Consistency between these reports is essential to ensure land use and planning decisions in surrounding areas are compatible with the 20 year master plan. If the 2007 ANEF is not consistent with the 2009 PDMP, it could result in incorrect decisions being made regarding land uses around CIA.

The inconsistencies are as follows:

- The plan for General Aviation in Chapter 7 of the 2009 PDMP is inconsistent with the assumptions about GA used by Rehbein-AOS to generate the 2007 ANEF for CIA. The PDMP forecasts a 'significant increase in General Aviation operations'.[2] Rehbein-AOS assumed GA operations (currently nearly 50,000 movements per annum) would decline to only 1,892 movements per annum in their ultimate capacity ANEF.[3] The Rehbein-AOS ANEF assumes the vast majority of aircraft operating at CIA are large jets, which is not consistent with the 2009 PDMP. GA aircraft have a smaller noise footprint than jet aircraft.
- The passenger forecasts in the 2009 PDMP (Table 5.5), when divided by the aircraft forecasts (Table 5.6) show that in the mid range forecast, there were **77.8 passengers per aircraft** in 2007/08 (ie 2,850,016 ÷ 36,639). It remains the nearly the same, at **77.2 passengers per aircraft** in 2029/30 (ie 6,860,566 ÷ 88,864), and similarly for the high range and low range forecasts. The mid range forecast for international flights in 2029/30 has an average of only 153.4 passengers per aircraft. Hence, the 2009 traffic forecast in the PDMP is inconsistent with the PUC traffic assumptions used in the 2007 ANEF by Rehbein-AOS (Table 5), which assumes much larger aircraft.

[1] Rehbein-AOS (2007) *Canberra International Airport Practical Ultimate Capacity ANEF* and attachments

[2] PDMP (2009) page 86

[3] Rehbein-AOS (2007) Table 5, page 14

- The mid range forecast of 2,493 international flights per annum by 2029/30 in the 2009 PDMP is inconsistent with the ultimate capacity forecast of 25,106 international flights used by Rehbein-AOS in the 2007 ANEF. CIA expect to reach the PUC level of traffic 'between 2050 and 2060'. It would require compounding growth in international flights of more than 12% per annum from 2029/30 to 2049/50 in order to achieve this. By way of comparison, BITRE data shows international aircraft movements at all Australian airports averaged growth of 2.7% per annum over the decade 1997/98 to 2007/08.
- The sum of all non-RPT aircraft movements (GA, freight, military, etc) in the Rehbein-AOS report has 32,280 non-RPT aircraft movements per annum, which CIA expects to reach between 2050 and 2060. This is inconsistent with the mid-range forecast of 65,308 non-RPT flights per annum in 2029/30 in Table 5.6 of the PDMP. In other words, the PDMP forecasts a growing GA / non-RPT industry at CIA, whereas the 2007 ANEF assumes a declining GA / non-RPT industry at CIA.
- The overnight freight concept in the PDMP (Table 6.3) places a figure of 15 jet aircraft per night in 20 years. This would equate to 10,950 movements per annum (ie 15 × 2 × 365), compared with the Rehbein-AOS assumption of 20,574 night time freight jet movements. This large discrepancy in night time movements is further compounded by the high weight given to night time movements in creating the noise exposure contours.
- The timeframe for the PUC, expected 'between 2050 and 2060', is no longer sufficiently accurate or specific to meet the Airservices guidelines of producing an ANEF *"for a particular year"* or *"progressive stages in the development of an airport within a definite time horizon"*.[4] As such, Airservices Australia should be asked to confirm whether the endorsement given in 2008 still stands, due to the changes in the underlying plans, assumptions and timeframes in the 2009 PDMP.
- Access Economics has noted in the past (and is cited in the PDMP) that CIA could attract services to a select number of destinations, such as Singapore and Auckland. However, the development of a large number of international routes remains unlikely. As such, any impression that Access Economics agrees with its international flight forecasts in the PDMP is not correct.
- Rather than allow for the trend of newer, quieter aircraft, the ANEF contours produced by Rehbein-AOS, and in turn the 'High Noise Corridor', assumes a range of old aircraft, such as B757-200 and MD-11, will be operating at night. The PDMP expects the PUC to be reached 'between 2050 and 2060'. Production of the B757-200 ceased in 2005 and production of the MD-11 ceased in 2000, so the aircraft assumed by Rehbein would be more than fifty years old by the time the PUC is reached. A more plausible ANEF would use more modern aircraft that are still in production and thus more likely to be still in service in several decades.
- The achievement of the level of traffic underpinning the ANEF relies heavily on the relocation of the main runway threshold to 450m south of its current location. Due to the substantial changes in the plans for the airport since the runway extension was approved (with the Conditions of Approval at the time) a new Environment Impact Statement (EIS) should be required prior to relocating the runway threshold.

While Airservices Australia may have endorsed the 2007 ANEF used in the rejected 2008 PDMP, the 2009 PDMP has made several changes to the timelines and interim forecasts,

[4] http://www.airservicesaustralia.com/aviationenvironment/noise/docs/aus_noise_contours.pdf

such that the assumptions underlying the 2007 ANEF developed by Rehbein-AOS is no longer consistent with the content of the 2009 PDMP.

Recommendation: a new ANEF should be prepared for CIA, for the year 2029/30 using a mix of jet and turbo prop traffic that is consistent with the GA, freight and RPT forecasts in the PDMP. Only newer aircraft that are still in production should be used to calculate the ANEF contours in 2029/30 and beyond.

Recommendation: the Minister should ring fence 50,000 GA movements at CIA until a suitable alternative GA aerodrome is developed in close proximity to Canberra, to prevent the planned decline in GA movements to 1,892, as forecast in the PDMP ANEF.

Recommendation: due to substantial changes in the plans for the airport, the Minister (in conjunction with the Minister for the Environment) should seek a new EIS before allowing the southern runway threshold to be relocated.

Recommendation: the Minister should issue regulations (as allowed for in s71(2)(d) but currently not in place) to clarify that an ANEF should relate to the 20 year *planning period* (ie currently 2029/30 in the case of CIA) and that the ANEF should be consistent with the 20 year business plans and forecasts contained in the master plan.

Recommendation: the Minister should implement a process that draws on the skills of both BITRE and Airservices Australia to independently assess the reasonableness and plausibility of the traffic forecasts and modelling that underpin the ANEF and the consistency of those forecasts with the contents and planning period of the master plan, prior to approving the master plan. Airservices Australia should be asked whether the 2008 endorsement still stands, given the revised plans and timelines in the PDMP.

Other issues identified in the CIA PDMP

The proposed development at Tralee is consistent with the ANEF contours in the PDMP, as required in Australian Standard 2021-2000. That noted, the PDMP proposes further restrictions on a larger geographical area based on a new concept of a 'High Noise Corridor'. The 'High Noise Corridor' is a concept created by CIA, which is not in common use and is not defined in any Australian Standard. Any move away from the current Australian Standard 2021-2000 should be the subject of a rigorous regulatory impact statement and cost benefit analysis.

With one company seeking to impose an encumbrance on an asset of another company (beyond the current standards in AS-2021-2000), the master plan process allows the Minister to adjudicate as to whether society as a whole is better off as a result of the additional encumbrance, and presumably any compensation required due to the imposition of the additional encumbrance – and in the same way that a favourable rezoning results in a 'betterment levy', an unfavourable rezoning should result in compensation.

- In weighing the competing interests, the PUC level of traffic that generates the ANEF contours (and the wider area in the 'High Noise Corridor') in the PDMP is expected by CIA to be reached between 2050 and 2060. In net present value terms, this would be heavily discounted. However, the encumbrance on Tralee is having a current and ongoing impact. The trade off between distant benefits versus actual current costs needs to be made with care.

- Indeed, s71(2)(e) in the *Airports Act 1996* suggests the onus is on the airport lessee company to manage and mitigate noise intrusion.
- The PMDP provides a range of alternative uses for each precinct, which makes it difficult to assess which developments CIA intends for each precinct. The PDMP does not appear to have the level of detail required in section 5.02(2) of the Airports Regulations (1997).
- The PDMP states that the proposed development at Tralee would lead to 'noise sharing' over suburbs of Queanbeyan and Canberra. This is inconsistent with Airservices Australia's principles for noise sharing.[5] Airservices Australia's principles and procedures are a pragmatic response to the difficult political and socioeconomic issues surrounding aircraft noise. Principle 11 states:

  In deciding between mutually exclusive, but otherwise equivalent options, involving

  (i) the overflight of an area which has previously been exposed to aircraft noise for a considerable period of time (and which a large proportion of residents would therefore have been aware of the noise before moving in); or

  (ii) a newly exposed area,

  option (i) should be chosen.

  This Principle makes it very clear that residents moving into Tralee would not be able to achieve noise sharing over areas that are not currently subject to aircraft noise. Hence, Figure 14.2 in the PDMP (which shows noise sharing over newly exposed areas in Tuggeranong, Queanbeyan and North Canberra as a result of the development at Tralee) is inconsistent with Airservices Australia's Principles for noise sharing, which would clearly chose overflight option (i), namely Tralee. As such, Figure 14.2 in the PDMP is invalid.

Freight hub and Sydney overflow concepts

The CIA PDMP contains proposals for a freight hub and for CIA to act as an overflow airport for Sydney. A range of issues with these concepts are listed below.

- The development of a freight hub at CIA could result in stranded assets at other airports. Australians (mainly through their super funds) have invested considerable sums in specialised freight facilities at various airports around Australia. Government support of the CIA hub proposal (while generating investment in the Canberra region) could result in wasteful duplication of existing infrastructure, causing assets elsewhere in Australia to become redundant. Furthermore, any jobs created at the CIA hub may simply displace jobs lost at other freight facilities, rather than creating 'new' jobs. The hub may also cause an unnecessary duplication of existing Government infrastructure (such as AQIS and Customs facilities). There may also be costs associated with relocating AQIS and Customs staff to Canberra.
- The PDMP asserts that a freight hub would be more efficient and generate lower emissions than a 'network-based' system. No evidence, costing or modelling is provided to support this conclusion. To the contrary, the most efficient method of

[5] Airservices Australia (1997, revised 2002) *Environmental Principles and Procedures for Minimising the Impact of Aircraft Noise,* and as detailed in Wilkinson Murray (2003) *The Tralee Development and "Noise Sharing" at Canberra International Airport*

transporting people and freight is almost always to fly point-to-point (as low-cost carriers have demonstrated). Hubs only generate efficiencies where there is insufficient demand to fill an aircraft – in this case, a hub creates efficiencies by aggregating demand on uneconomic routes into a minimum efficient scale. Other than in circumstances where this 'demand aggregation' benefit exists (which does not appear to be the case for the CIA freight hub proposal), a hub-based model would be expected to increase fuel consumption and emissions compared with flying point-to-point. Thus, the claims of lower emissions in the PDMP should be heavily discounted.

- The PDMP asserts that a high speed rail link would cost less than building a new airport elsewhere. This assumption is not supported by any evidence or modelling, and runs counter to previous costs estimates of building a high speed train between Canberra and Sydney. Furthermore, the actual construction costs of recent conventional railways, such as the Alice-Darwin railway and the Victorian regional fast rail projects, were very expensive compared with the cost of the new terminal at Adelaide Airport and the estimated cost of the new parallel runway at Brisbane Airport. The land acquisition cost of a railway corridor is also likely to be high. Hence, it is likely that a new terminal at (say) Goulburn could be built at lower cost than a high speed rail link to Canberra.
- Sydney Airport has considerable scope to accommodate the needs of Sydney for the foreseeable future. Many routes in and out of Sydney use relatively small aircraft (such as B737), which can increase over time to larger aircraft types in order to accommodate more passengers. Sydney still has a large amount of transit/transfer traffic (such as passengers flying MEL-SYD-LAX). Over time, as Sydney becomes more congested, it will increasingly serve origin-destination traffic (such as SYD-LAX) rather than transit/transfer traffic, resulting in more direct flights to those locations that are currently transiting through Sydney (such as MEL-LAX), which in turn frees up space on the SYD-LAX flight for origin-destination traffic. The drop in travel demand due to the global financial crisis may also push back the timeframes for when Sydney becomes 'full'.
- To the extent that CIA initiatives such a freight hub or a second Sydney airport occur naturally through airlines and passengers voting with their feet (and wallets), then those market forces should be allowed to play out. The government should not distort the market with government funding or government declarations of support, without a thorough and independent feasibility study into these proposals. The detail in the PDMP is inadequate for deciding whether a Sydney overflow or national freight hub at CIA is in the national interest.
- A greater recognition of the uncertainties around demand forecasting would be appropriate, given the difficulty of the task. For example, the Brindabella Business Park website[6] indicates there is 23,725m2 of vacant office space available for lease, with a further 34,000m2 under construction and available from June 2009. The Majura Park precinct has a further 36,376m2 of vacant space available now or soon to be completed and the Fairbairn precinct has 8,334m2 of vacant space. In total there is 102,435m2 of vacant office space currently listed at CIA. This apparent over-supply raises questions about the ability of the lessee company to forecast the needs or demands for developments on the airport site.

Objective 2 of the PDMP is to "*Develop Canberra International Airport as a multi-modal transport hub for passenger and freight connections*". Objective 7 is "*Being in a position to*

[6] http://www.brindabellabusinesspark.com.au, as at 4 March 2009

meet the needs of Sydney Airport users, including overflow domestic and international passenger and freight services". The development plans are large-scale with significant potential impacts for the ACT and its region.

Airports are a crucial part of the infrastructure of a modern economy. The primary economic function and wider social importance of airports is to facilitate the efficient movement of people and freight in and out of the region it serves.

A balance needs to be struck between the aviation services needed by the local community and the implications of developments for planning, infrastructure provision, traffic congestion and aircraft noise. The main economic value of the airport to the ACT community is the availability of convenient direct flights to a range of destinations. Over time, the airport is likely to attract direct flights to more Australian cities and some selected international destinations such as Auckland and Singapore. This will be of considerable benefit to residents of the Canberra region.

However, the development of a large amount of transit/transfer traffic (which is what characterises a 'hub'), is of little benefit to the Canberra region.

Recommendation: if a national freight hub or Sydney overflow develops at CIA naturally, through market forces, then so be it. However, a far more rigorous feasibility study is required before the Government should intervene to help achieve, promote or declare support for a national freight hub or Sydney overflow at CIA. As such, the PDMP cannot be endorsed in its current form.

Recommendation: the priority of CIA should be on serving the Canberra region with a wide range of convenient direct flights. Attracting transit/transfer (ie hubbing) traffic generates few benefits (and a lot of noise) for the Canberra region, so should be given a low priority.

Other issues with the PDMP

- Chapter 10 of the PDMP proposes child care, hotel/motel developments and other public buildings which appear to be in precincts that are inside the ANEF 30 contour in Chapter 14. As noted above, the ANEF needs redoing, but if the revised ANEF showed a similar noise level in those precincts, those developments would be deemed as 'unacceptable' based on AS 2021 - 2000. Children in the existing and planned child care facilities on-airport should received the same protection under AS-2021-2000 as children in child care off-airport.
- The PDMP has many overlapping proposals, with each precinct being marked for several alternative developments. For example, at various places in the PDMP, the Fairbairn apron is proposed for freight, GA or VIP operations. It is unclear from the PDMP what developments will ultimately occur where. Regulation 5.02(2) requires the master plan to have *"the detail equivalent to that required by … the State or Territory in which the airport is located"*. As such, the views of ACTPLA should be sought to confirm the CIA PDMP indeed contains the level of detail required by ACTPLA (being the relevant body for planning in the ACT).
- The PDMP proposes an In Bond / Tax Free Zone. Approval of this is beyond the Ministers powers under the *Airports Act 1996*, as it would require approvals from the Commonwealth (for income tax and excise), the ACT Government (for payroll tax) and COAG (for the GST). Such approvals are highly unlikely, as it would allow businesses to operate in a location where they benefit from the national security, infrastructure,

political stability and skilled workforce available in Australia, without contributing to the cost of providing those benefits.

Recommendation: the Minister should not approve a plan that includes hotel/motel and child care facilities within ANEF 30. Children in care on-airport should receive the same protections as children in care off-airport, as provided in AS-2021-2000. The Minister should seek the views of ACTPLA in relation to the level of detail required in regulation 5.02(2). The Minister does not have the powers to approve a PDMP that includes an In Bond / Tax Free Zone.

PART 2: REVIEW OF THE 'HIGH NOISE CORRIDOR'

Part 2 of this review examines in detail the appropriateness of the Practical Ultimate Capacity (PUC) traffic assumptions,[7] the resulting Australian Noise Exposure Forecast (ANEF) for Canberra International Airport (CIA), and the 'High Noise Corridor' proposed by CIA as the basis for land use and planning decisions.

As noted in Part 1, the traffic forecasts underpinning the 2007 PUC are no longer consistent with the traffic forecasts in the 2009 PDMP. Even so, the proposed development at Tralee (also know as South Jerrabomberra) has been amended to ensure it is consistent with the PUC ANEF contours as described in the Australia Standard 2021-2000.

The PDMP then goes further than the current Australian Standard, proposing additional restrictions on a larger geographical area based on the concept of a 'High Noise Corridor'. This raises the question of whether the 'High Noise Corridor' concept is more appropriate than the current Australian Standard for land use and planning in the vicinity of licensed airports.

Summary

The provision of airport infrastructure uses a considerable amount of society's resources – large amounts of land, earthworks, concrete and so forth – in order to provide services to airlines. Long term planning is important to ensure long-lived assets on the airport site are developed in a logic and efficient manner. Planning is further complicated by local, state, territory and commonwealth governments all having an interest in the decisions made.

The living standards of society tend to be higher when people make decisions based on the true and full costs and benefits to society of their decisions. Access Economics has previously argued that airline passengers should pay prices that reflect the full opportunity cost of the resources required to provide airport services (including the opportunity cost of airport land).[8] CIA has suggested that land in the 'High Noise Corridor' be reserved for land uses such as agricultural and light industrial land uses. The 'High Noise Corridor' covers a larger area than the ANEF 20 contour and is more onerous than the current Australian Standard (AS-2021-2000). If more land is required for airport operations, markets exist that allow land to be purchased and reserved for aviation purposes, with the costs passed on to airline passengers and airfreight consignors at its opportunity cost.

Rather than CIA just buying up the land it claims it needs to support its future development, the government has been asked to consider intervening to restrict residential land release at Tralee beyond the existing ANEF contours as specified in AS-2021-2000. Any such proposal should be tested for validity and subjected to a rigorous cost benefit analysis (CBA). The 'High Noise Corridor' is not the correct tool for informing decisions on how to best maximise the wellbeing of society – CBA, when done properly and based on valid assumptions is the correct tool. AS-2021-2000 is based on decades of scientific and socioeconomic research and development, whereas the 'High Noise Corridor' has no scientific rigor.

[7] Rehbein AOS (2007) *Canberra International Airport Practical Ultimate Capacity ANEF*

[8] Access Economics (2005) *The Value of Airport Land,* and Access Economics (2006) *Implementing an Opportunity Cost Valuation of Airport Land*

The results of the CBA would then feed into a full regulatory impact statement before a change to the current Australian Standard could be made. The changes proposed by CIA (to change AS-2021-2000 to use the 'High Noise Corridor' concept rather than ANEF contours) would have to be subject to a full regulatory impact statement and signed off by the Office of Best Practice Regulation before the Minister could approve the PDMP as it currently stands.

Specific issues with the 'High Noise Corridor'

The 'High Noise Corridor' is an irregular geographical area, loosely based on the ANEF 20 contour, which in turn is generated from the PUC traffic assumptions. That is, a series of extrapolations are needed to arrive at the 'High Noise Corridor'. The 'High Noise Corridor' does not appear be based on any scientific method and is not used at any other airports. The 'High Noise Corridor' has unusually straight lines and square corners – it does not appear to follow undulations in terrain nor aircraft flight paths.

Canberra currently has 88,942 fixed wing aircraft movements per annum, of which 39,629 per annum are RPT aircraft movements.[9] The rest (49,313 per annum) are mostly GA aircraft (below 7 tonnes), with a few thousand military and VIP movements. RPT aircraft movements at CIA have been flat, at between 35,000 and 40,000 for the past seven years.

The level of fixed wing movements in the CIA PUC (282,120 movements a year)[10] is similar to the current level of fixed wing traffic at Sydney Airport (295,768 in the 2008 calendar year).[11] The CIA PUC of 282,120 aircraft movements is comprised of 274,292 RPT and dedicated freighter movements. This suggests only 7,828 GA, military, VIP and training flights will be accommodated when CIA reaches it PUC, a significant reduction on current levels for those sectors of the aviation industry. It is unclear where this displaced activity will be relocated. The costs of this relocation should be included in any CBA. The seven-fold increase in RPT and freight movements may take a very long time to achieve, making the associated benefits small in NPV terms. Even the CIA forecast of 'between 2050 and 2060' requires four decades of uninterrupted economic growth (the Australian Bureau of Statistics recently reported that the ACT economy was in recession in the second half of 2008). The forecasts also seem to ignore the introduction of the Carbon Pollution Reduction Scheme and the impact of this on airfares.

Against this, there are immediate constraints on the development of new residential land releases. The proposed development at Tralee is close to major urban centres and major transport corridors. The housing affordability issues in the ACT region are a more immediate and pressing issue, and have been extensively documented.[12]

Other issues with the PUC ANEF are as follows:

- The recent extension and strengthening of the main runway to accommodate VIP and military aircraft at CIA required a large subsidy from the previous Government. This presumably meant the extension was unviable under the normal method of airlines paying airport charges to generate a fair return on airport infrastructure. The claim by

[9] Airservices Australia *Movements at Australian Airports* 2008 for total movements and BTRE *Airport Traffic* data 2007-08 for RPT movements.

[10] *Canberra International Airport Practical Ultimate Capacity ANEF*, Rehbein AOS, 28 May 2007

[11] *Movements at Australian Airports*, Airservices Australia, Canberra, 28 Jan 2009

[12] Access Economics (October 2006) *Residential and industrial Land Demand Forecast: Canberra and Queanbeyan*

CIA that there is now sufficient traffic to prevent the development at Tralee is difficult to reconcile with the lack of traffic that made the extension unviable without a subsidy.

- The Brisbane Airport EIS for the new parallel runway concluded a PUC of around 256,000 in the do nothing scenario of not building the parallel runway. While it is difficult to compare across airports, Brisbane Airport is currently broadly similar to CIA (with one main runway and a cross runway). The CIA PUC is similar to the current level of traffic at Sydney Airport (which has three runways). CIA also has fog issues.
- The Rehbein-AOS methodology for calculating the PUC ANEF uses the AS-2021 definition of 'night' as 7pm to 7am, with a multiplier of 4.0 is used on 'night' movements (ie the noise from a 'night' movement generates four times more noise impact than a 'day' movement). The traffic forecasts have a large number of flights between 6am to 7am. By assuming a large number of flights at this time, it allows those flights to have 4 times greater weight. A sensitivity analysis, where the morning peak occurs instead between 7am to 8am, would be useful to ensure the traffic assumptions have not been 'gamed' to place as much traffic as possible into the highly weighted 'night' period.
- The ANEF is the combination of three underlying ANEC plots. Rather than using a weighted average to combine these ANEC plots, the ANEF contour is the outer envelope of all three ANEC plots: $ANEF=MAX(ANEC_1,ANEC_2,ANEC_3)$. This causes the area within the ANEF contours to be larger than (rather than an average of) the underlying ANEC contours, thus maximising the size of the ANEF. The 'High Noise Contour' then goes further by adding additional land to this already outer envelope.
- According to CIA, the PUC level of traffic will take around four decades to occur. Aircraft technology is rapidly evolving. The noise of jets has improved considerably compared with several decades ago and significant research is being done on improving the noise output of the next generation of aircraft.
- The PUC has a large number of wide-body aircraft arriving at night. This is at odds with typical daily distributions at other non-curfew airports such as Brisbane.
- The number of dedicated freighters in the CIA PUC is around four times higher than the current number of dedicated freighters at Sydney.
- Concerns surrounding the CIA forecasting methodology have been raised on several occasions in the past.[13]
- An independent review of the forecasts (focusing on demand rather than capacity) and the CBA of residential land release would be beneficial. Airservices Australia has strong expertise in a range of aviation areas and noise modelling, but in the case of traffic forecasting and CBA, a more appropriate agency to be tasked to review these would be the BITRE.

[13] See for example Access Economics (2003) *Review of Canberra Airport Traffic Forecasts*

CONTEXT AND CURRENT TRAFFIC

CIA is an important part of the transport system for Canberra and the surrounding region. It provides services to leisure, business and government travellers to a number of destinations. There are currently direct flights between Sydney, Melbourne, Brisbane, Adelaide, Perth, Newcastle and Albury. The airlines serving CIA are Qantas, QantasLink, Virgin Blue and Brindabella Airlines. Tiger Airways has recently commenced services to CIA. JetStar does not currently operate to CIA.

CIA has scope to attract direct flights to some international destinations,[14] though currently does not have any regular international flights. The airport has also developed a business park – which has provided an alternative to Canberra's traditional town centres, particularly for aviation-related businesses – and retail space with the opening of Brand Depot. The airport also plans to grow its aviation business, by undertaking capital upgrades to the airport terminal and associated infrastructure.

The main runway at CIA was recently extended and strengthened to accommodate large VIP and military aircraft. This upgrade was subsidised by the Commonwealth Government to ensure the airport can accommodate the aircraft of official visitors, such as Air Force One. The PUC assumes total VIP/Military movements of 2,776 per annum, of which 238 per annum would be by VIPs using Boeing 747 aircraft. There are not enough foreign dignitaries with a B747 to make this number plausible. The President of the United States only visits Canberra around once a decade.

The government subsidy for the runway upgrade was required (presumably) because it was not commercially viable for CIA to fund the upgrade based on the traffic growth expectations at the time (as recently as 2005). That is, the upgrade would not have occurred if it was left to the normal market mechanism[15] of airlines (and other visiting aircraft) paying airport charges to ensure a fair return on investments in airport infrastructure.

Importantly, the runway extension has not changed the physical location of the runway for GA and RPT aircraft – the extension is not used as part of normal operations. The PUC ANEF is based on RPT aircraft utilising a part of the runway which is not currently approved for RPT use. Due to the significant changes in plans for the airport, the 450m southern relocation of the runway threshold should be subject to a new EIS. In any case, existing approvals may have lapsed.

CIA now has plans to make the airport a freight and tourism hub, using its newly extended runway to act as an overflow for Sydney Airport. There are similar overflow aspirations at airports such as Bankstown, Goulbourn, Newcastle and Wollongong.

In recent years, CIA has worked with its major users (Qantas and Virgin Blue) to develop the Required Navigation Performance (RNP) to move flights from directly over Jerrabomberra. Aircraft noise issues have caused a delay in the development of residential lands west of Jerrabomberra, including the site at Tralee.

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[14] Access Economics (2005) *The Potential Demand for Direct International Flights between Canberra and Singapore*

[15] See, for example, Productivity Commission (2007) *Review of Price Regulation of Airport Services* and ACCC Decisions relating to Canberra Airport at www.accc.gov.au

The divisions west of Jerrabomberra also include Environa and Poplars and in total constitute just under 5,000 potential dwellings. These are complimented with the land division of Googong south of Queanbeyan.[16] The Googong development has the potential of about 5,500 dwellings[17] and is in less conflict with the current and projected flight paths of the airport, though is further from major transport corridors, such as the Monaro Highway, and is further from the employment areas of Civic, Woden and Tuggeranong. In any case, around 1,900 dwellings per annum are required in the ACT region to support population growth over the next few decades[18] so fully developing all of these sites equates to just under 6 years of land supply for the region.

Currently 65%[19] of the residents of Queanbeyan and Jerrabomberra commute to Canberra for work, with the Monaro Highway, Canberra Avenue and Pialligo Avenue acting as the main arterial roads into Canberra. The agricultural land around the Monaro Highway through Symonston and into Molonglo Gorge offer a natural buffer to aircraft noise in the flight path. The ACT government (and previous planners) have sought to use these lands for industrial purposes that include Fyshwick and Hume, the SouthCare helicopter base and the Canberra jail. Farther from the airport the residential area of Jerrabomberra sits near the current flight path. The Tralee site is between 8km and 12km south of the end of the main runway.

The ANEF contours based on the practical ultimate capacity (PUC) of the airport is one metric in a series of measures that have been developed to determine the environmental impact of an airport on adjacent lands. The ANEF assessment based on PUC sits in the context of an array of measures implemented by the Australian Government after the sub-optimal measures used for the Sydney Airport extension of the late 1980s. The system was adopted from the Noise Measurement Index (NMI) used by the United States Federal Aviation Authority. The suit of measures adopted by Airservices Australia include,

- Australian Noise Exposure Forecast (ANEF);
- Australian Noise Exposure Index (ANEI); and,
- Australian Noise Exposure Concept (ANEC).

The output of the measures is a series of ‘contours’ designed to give an insight into the noise impact of aircraft. Of most interest is the ANEF based on the PUC and for a particular year into the future. ANEF contours can be produced by converting ANEC data into ANEF information. Beyond these contours, CIA has added a ‘High Noise Corridor’, loosely based on the PUC ANEF.

SPECIFIC ISSUES WITH THE ‘HIGH NOISE CORRIDOR’

The PUC, on which the ‘High Noise Corridor’ is loosely based, is a measure of capacity, rather than demand. It measures the number of aircraft that could theoretically take off or land every hour. The key parameters are 36.47 movements per hour for the 19 hours between 5am and midnight, and an arbitrary 80 movements during the 5-hour period from midnight to 5am. This is grossed up to an annual figure by multiplying by 365. Hence, the PUC of 282,120 is derived from the following formula (numbers are rounded):

[16] NSW Department of Planning (2007) *Queanbeyan City Council Residential and Economic Strategy 2031* and the subsequent *Addendum Report* (December 2008).

[17] Ibid

[18] Access Economics (2006) *Residential and Industrial Land Demand Forecast: Canberra and Queanbeyan*

[19] NSW Department of Planning (2007 and 2008).

PUC = 282,120 = ({ 36.47 movements × 19 hours } + 80 movements) × 365

The Rehbein-AOS report says nothing about whether there will ever be sufficient demand for air travel and airfreight to make this many flights commercially viable, nor the timeframe for demand to reach capacity. The PDMP expects this level of traffic to be reached in a wide and distant timeframe of 'between 2050 and 2060', however, no economic modelling is provided to support this demand projection.

The CIA PUC of 282,120 fixed wing movements a year, plus 2,920 rotary movements a year, is a very large amount of traffic for an airport with one main runway and a small cross runway. Gatwick Airport, near London, is one of the busiest single-runway airports in the world, with 32.7 million passengers on 261,274 aircraft movements.[20] Gatwick is one of several airports serving the London metropolitan area, which has a population of around 14 million people (depending on the definition of 'London').

In the 2006 calendar year, Airservices reported 167,244 movements at Brisbane airport (including 1,332 helicopters). Brisbane is nearing full capacity and is planning a parallel runway. The Environmental Impact Statement for the New Parallel Runway at Brisbane Airport estimated a PUC of its existing runway system of 256,000.[21] While it is difficult to compare airports, as every airport has unique weather patterns and mix of aircraft, that noted, Brisbane Airport's currently runway system is broadly similar to CIA.

The PUC of CIA's two runway system is similar to the current level of traffic using Sydney Airport's three runway system. In the 2008 calendar year, Sydney Airport had 295,768 fixed wing and 5,984 rotary movements (301,752 aircraft movements in total), so CIA's PUC has more fixed-wing movements that Sydney current attracts. Rotary movements are not as relevant for runway capacity and noise (though they do add to congestion in the surrounding airspace).

The large number of wide-body aircraft arriving at night is different to the pattern at other non-curfew airports such as Brisbane. The daily profile of aircraft arrivals and departures at Brisbane shows that virtually all movements each day occur between 6am and 9pm, due to the passenger demand for travelling at these times and other operational issues.[22]

The number of dedicated freighter movements in the CIA PUC is more than three times higher (at 24,452 in the Rehbein-AOS report) than the number of dedicated freighters per annum currently operating at Sydney Airport (7,475).[23] The NSW Department of Planning notes:

> *Given that Canberra Airport currently operates under a single runway for jet operations it is hard to see how the airport can practically achieve the growth projected. This would, for example, involve 24 hour operations with approximately 2 minute gaps – whereas Sydney Airport, with 2 runways in operation has a 6 minute gap and a shorter flight window.*[24]

[20] Gatwick Airport (2006) *Interim Master Plan*

[21] See Table 2.6g on page A2-62 in A2.pdf at http://www.newparallelrunway.com.au

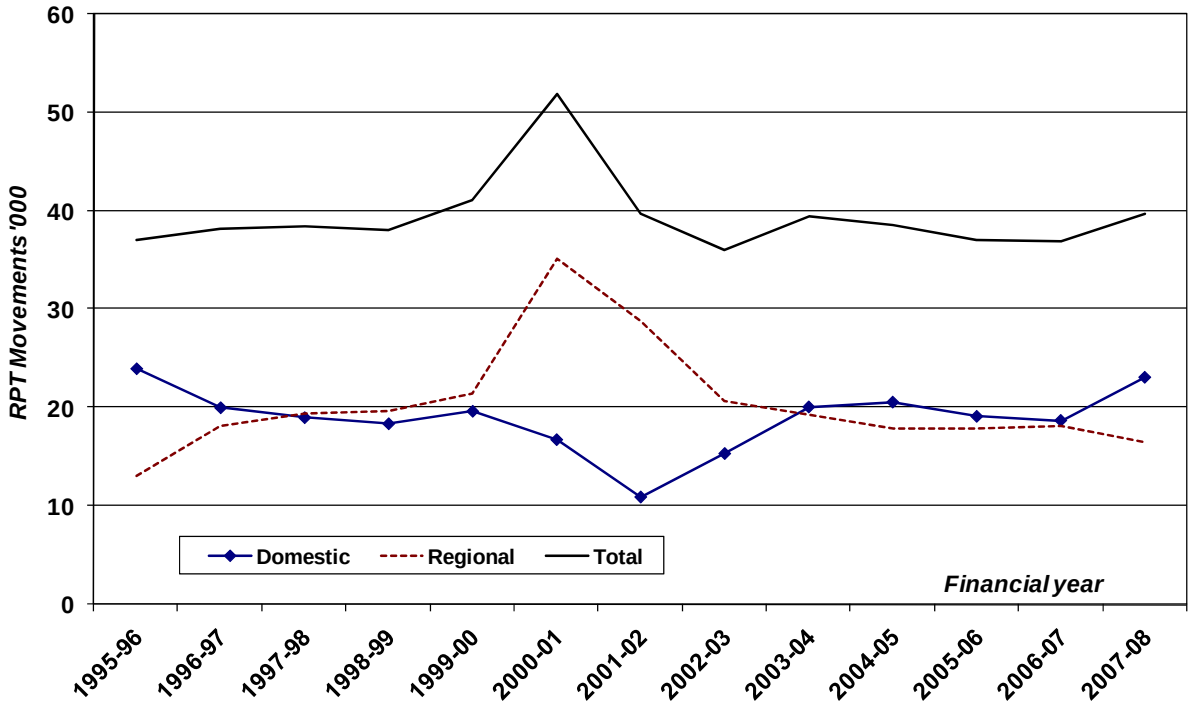
[22] See figure 2.5f on page A2-57 in A2.pdf at http://www.newparallelrunway.com.au

[23] See fact sheets at http://www.sydneyairport.com.au

[24] NSW Department of Planning (2007) *Queanbeyan City Council Residential and Economic Strategy 2031*

Figure 1 outlines the use of the airport in the previous 12 years from 1995-96 to 2007-08. Aside from the one-off effect of the Sydney Olympics, the airport has shown little growth, with total commercial (RPT) aircraft movements relatively flat, remaining between 35,000 and 40,000 over the past seven years.

FIGURE 1: MOVEMENTS AT CANBERRA INTERNATIONAL AIRPORT



Source: BITRE

Future outlook

It would require compound growth in movements of more than 10% per annum for demand to reach PUC in two decades. At a more moderate growth rate (though still rapid compared with the past decade) of 5% per annum, it would take more than four decades of continuous economic growth for demand to reach PUC.

The population of Sydney is currently around 4.3 million and Brisbane is around 1.9 million. The ACT has a population of 330,000 (with around 380,000 in the wider ACT-Queanbeyan region) and is projected to grow to about 380,000 over the next 20 years (446,000 including Queanbeyan).

Sydney Airport has around 33 million passenger movements on its 295,768 fixed wing aircraft movements.[25] The Rehbein-AOS PUC report does not mention passengers, though to fill the PUC aircraft movements at CIA (even after allowing for movements by dedicated freight aircraft) would require in the order of 25 million to 30 million passengers per annum originating from or destined for the Canberra region. Some of this traffic could be connecting (transit/transfer) traffic, but given the preferences of passengers for direct flights, a large proportion of connecting flights hubbing through Canberra may be difficult to attract. The hub-and-spoke model of full service airlines is unlikely to be the source of most future

[25] MAp airport traffic ASX releases and movement data from Airservices Australia

growth, with the point-to-point model of low cost carriers such as Virgin Blue, JetStar and Tiger Airways, likely to be the main source of future growth.

COST BENEFIT ANALYSIS AND THE 'HIGH NOISE CORRIDOR'

The 'High Noise Corridor', based loosely on the outer extremities of the PUC ANEF 20 contour, is being put forward as the basis for determining residential land release. The Tralee development is consistent with AS-2021-2000 guidelines on acceptable developments within the ANEF contours in the PDMP, but is within the area that CIA refers to as the 'High Noise Corridor'.

The adoption of the new 'High Noise Corridor' concept, rather than the accepted standards in AS-2021-2000, requires careful consideration.

Cost benefit analysis (CBA), when done properly, allows policy makers to balance the costs imposed and the benefits that flow to the community from a policy decision or a change in regulations, relative to a 'do nothing' scenario (in this case, the existing system in AS-2021-2000). Using the 'High Noise Corridor' as the metric for determining land release is unlikely to result in an optimal outcome. The 'High Noise Corridor' is not the correct tool for informing decisions on how to best maximise the wellbeing of society – CBA (done properly) is the correct tool to guide any decision to move away from AS-2021-2000.

Changing Technology

A rigorous CBA would need to take into account changing technology. Aircraft noise has been reducing at a steady rate from the early inception of jet aircraft (see Appendix). Boeing and some of its partners have joined the effort to make a quieter aircraft in their Quiet Technology Demonstrator (QTD) program and follow-up initiative QTD2. To reduce noise QTD and QTD2 have focused on improving technology in the;

- Engine (includes larger, slower fans);
- Nacelle (cowling that houses the engine);
- Chevrons (saw cut panels aft of the engine designed to direct air); and,
- Airframe (include the wings and landing gear).[26]

Improvements are also being made in aerodynamics and the measurements used. Boeing research now includes the ability to pinpoint where the design flaws are and actively change design to reduce environmental impact; this process is called phased array.[27] While testing the 777, using the phased array technology, Boeing discovered an element on the wing was making a "whistling sound". Boeing were able to design another element that did not make the whistling sound, thus reducing the noise impact.

Future aircraft may also benefit from current research being undertaken – again using phased array technology – in active chevron design and join-less nacelle liner, the former designed to augment airflow and the latter designed to increase the noise retarding abilities of the engine cover.[28]

[26] Boeing (2007) *Backgrounder Boeing Quiet Noise Technology Initiatives* http://www.boeing.com/commercial/environment/pdf/qtd.pdf

[27] Ibid

[28] Ibid

NASA research has found larger slower moving fans can be used to reduce engine noise and the understanding of exhaust noise has been increasing.[29]

Boeing claim that use of technology outlined above has decreased the noise footprint of the recently launched 787 Dreamliner by 60% of that of similar aircraft in use today.[30]

Given the effort being put into aircraft noise technology and the improvements already attained in the past few decades, it may be reasonable to expect further evolution in technology, particularly when assessing a PUC that may take more several decades to fully utilised.

Rather than allow for the trend of newer, quieter aircraft, the ANEF contours produced by Rehbein-AOS, and in turn the 'High Noise Corridor', assumes a range of old aircraft, such as B757-200 and MD-11, will be operating at night. The PDMP expects the PUC to be reached 'between 2050 and 2060'. Production of the B757-200 ceased in 2005 and production of the MD-11 ceased in 2000, so the aircraft assumed by Rehbein would be more than fifty years old by the time the PUC is reached. A more plausible ANEF would use more modern aircraft that are still in production and thus more likely to be still in service in several decades.

[29] Glenn Research Centre (1999) *Making Future Commercial Aircraft Quieter, Glenn Effort will Reduce Engine Noise NASA Facts*, (FS-1999-07-003-GRC), Cleveland Ohio

[30] Boeing (2007) *Backgrounder Boeing 787 Dreamliner Being Designed for Environmental Performance*

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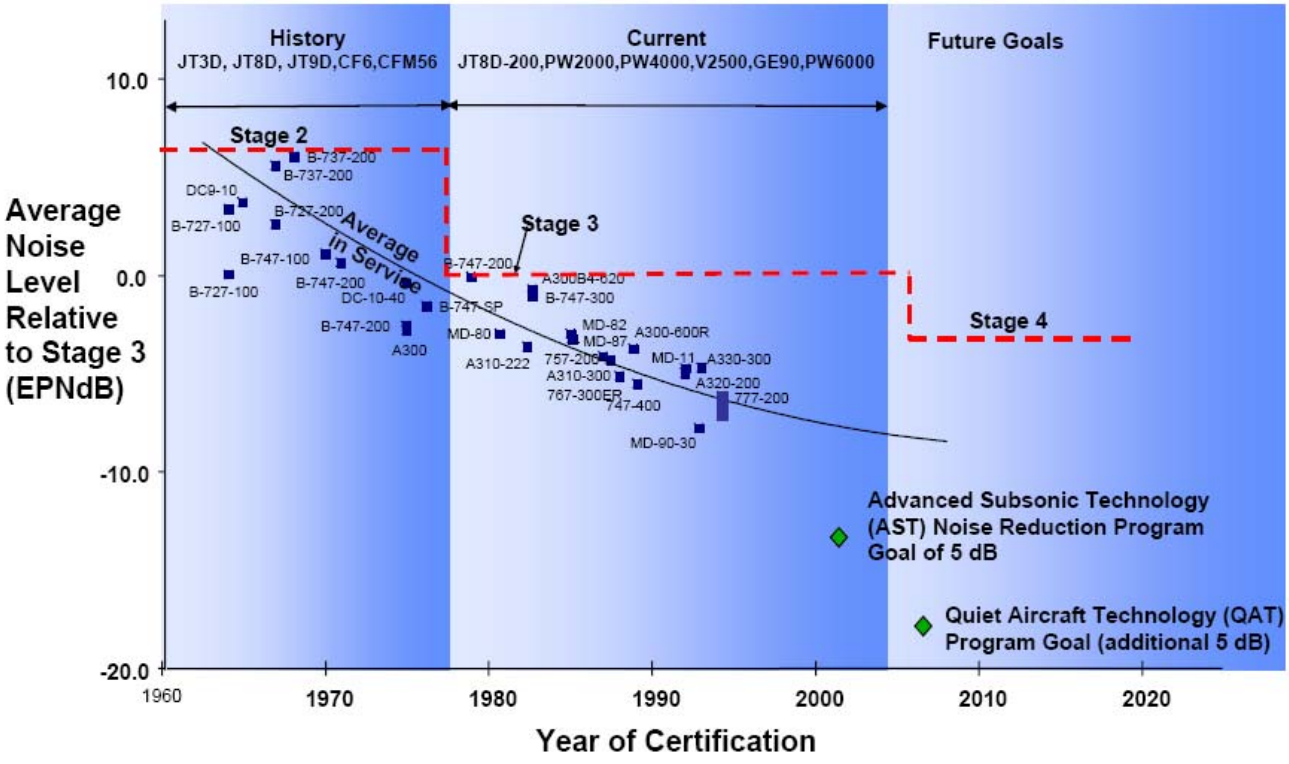
APPENDIX – DEVELOPMENTS IN AIRCRAFT NOISE



Source: Dennis Huff NASA Cleveland Ohio, *Technologies for Turbofan Noise reduction*, as presented to the 10th AIAA/CEAS Aerocoustics Conference Manchester, United Kingdom May 11, 2004