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Short comment

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The fundamental problem with the management of aircraft noise pollution is that the balance has always skewed in favour of airports and the aviation industry, particularly in recent times. While acknowledging the economic benefits of aviation, it is the aircraft noise affected community that is being asked to bear the cost of the growth in aviation activity and the impact it has on their wellbeing, amenity and property values. This is particularly the case in Sydney where Australia's busiest airport is located only 8 km from the CBD and causes aircraft to fly for extended distances over suburbs north and south of the airport. For the balance to be restored the full suite of approaches to aircraft noise management needs to be proactively applied – technology, operations and effective regulation.

Submission on the Aviation Green Paper, September 2023

By John Clarke

29 November 2023

About the Author

I am a longstanding member of the Sydney Airport Community Forum (SACF) and have sat on the Forum in different representative roles since its inception in 1996 until the last federal election. I am also a permanent member of the Implementation and Monitoring Committee for Sydney Airport.

Introduction

This submission is in response to the request for comment on the Aviation Green Paper, September 2023. It focuses entirely on Chapter 6, *Airport Development Planning Processes and Consultation Mechanisms* and specifically on the problem of aircraft noise, particularly as it applies to Sydney. It provides some general comments and then answer some of the questions for which specific comment has been requested. It also makes an important recommendation to proactive improve aircraft noise management in Sydney.

Aircraft noise is pollution. It is harmful to the environment, particularly to the urban environment and detrimental to the health and wellbeing of the people exposed to it. It needs to be treated like any other pollutant and programs implemented for it to be minimised if it can't be eliminated.

In its opening paragraph to the discussion on aircraft noise the Green Paper comments

“With Australian airspace becoming busier towards 2050 – with potential annual aircraft movements tripling by 2050 – the challenge will be to balance community concerns around noise with the social and economic benefits of aviation growth.” (p79)

The fundamental problem with the management of aircraft noise pollution is that the balance has always skewed in favour of airports and the aviation industry, particularly in recent times. While acknowledging the economic benefits of aviation, it is the aircraft noise affected community that is being asked to bear the cost of the growth in aviation activity and the impact it has on their wellbeing, amenity and property values. This is particularly the case in Sydney where Australia's busiest airport is located only 8 km from the CBD and causes aircraft to fly for extended distances over suburbs north and south of the airport. For the balance to be restored the full suite of approaches to aircraft noise management needs to be proactively applied – technology, operations and effective regulation.

Comments on the Green Paper

While acknowledging that pro-active aircraft noise management needs to be applied, the Green Paper then has no discussion about how this might actually be achieved. There is nothing on the magnitude of the problem of aircraft noise, current issues and deficiencies, nor how aircraft noise outcomes can be improved. As a precursor to the development of the Aviation White Paper which will set the policy direction for aviation this is a gross inadequacy. Instead of addressing the actual issue the Green Paper concentrates on the provision of information and consultation. This is a bureaucrat's response that avoids addressing the real problem. Unless there is a focus on improving outcomes and developing concrete actions to address the community's concerns, then information and consultation about aircraft noise are nothing more than an exercise in papering over the cracks.

If the Australian Government genuinely wishes to further explore the opportunities to better manage noise around our airports and the future White Paper is to provide a considered policy position on this very significant problem, then this deficiency in the Green Paper must be addressed.

Answers and Comments on the Questions Asked

Do you have comments on how the operation and effectiveness of the Noise Complaints Information Service could be improved?

Over time the Noise Complaints Information Service (NCIS) has reduced its hours of operation, its resourcing and the way it handles complaints, contributing to a decrease in complaints and an under reporting of them.

- The NCIS now only operates during business hours (it used to operate at night and weekends), yet the majority of complaints concern flights that are occurring after hours and at weekends when people are at home and most disturbed by aircraft noise. While people can still lodge an email complaint after hours, the inability to call a real person discourages people from complaining.
- Several years ago at the initiative of the Aircraft Noise Ombudsman the method of recording complaints was changed. Rather than recording each individual complaint from a member of the public, if that person has complained within the last month and the complaint is about the same issue, it is only recorded once. Yet the complaint is likely to concern operations of different flights on different days. This results in a significant under reporting of the problem.
- At the SACF meeting on 21 November 2024 Airservices stated that they do not have the resources to meet with or address issues with individual members of the public.
- Most relevant is that most people don't bother complaining any more because those complaints don't result in any change. Why bother?

While providing some useful information to the general public, and allowing some understanding of the community's response to change, the NCIS is primarily a marketing tool since it is not an effective agent to address systemic problems of aircraft noise pollution in the community. At the very least, it needs to update its methodology for reporting complaints to reflect the actual level of complaint.

How could the Australian Noise Exposure Forecast, and use of the ANEF in Government planning processes, be improved?

The ANEF is not just a land use planning tool. Despite its limitations, it is and always has been used as a flight path planning tool and as a metric to understand and communicate the impact of aircraft noise. This was confirmed by the then Minister for Infrastructure, Transport and Regional Development to the Chair of SACF in his letter of 18 October 2021 when he stated: "...the ANEF flight path planning tool (is) the primary mechanism for the assessment of noise from aircraft operations."

There are however three fundamental problems with the current ANEF and its use:

1. The land-use planning application of the ANEF and the reference in the Australian standard AS 2021:2015 on aircraft noise that aircraft noise under 20 ANEF is *acceptable* has been misunderstood and misused. At ANEF 20, 45% of the population will be moderately affected by aircraft noise and 11% seriously affected (Standards Australia, 2015, Figure A1, p.140). It is difficult to think that in any other application such numbers of people adversely affected would be considered "acceptable." This has also led to downplaying or the complete disregard for the

effect of aircraft noise on communities in areas exposed to less than 20 ANEF. It is for this reason that the 1995 Senate Select Committee in its report *Falling on Deaf Ears* stated “It is essential that information concerning noise impact at levels below 20 ANEF be provided to affected communities (paragraph 8.110) and recommended that ANEF be produced down to at least ANEF 15 and preferably ANEF 10. This should be a legislated mandatory requirement each time an ANEF or ANEC is produced.

2. The reaction to aircraft noise in the ANEF is derived from the survey of aircraft noise reported in National Acoustics Laboratories Report No.88 (Hede & Bullen, 1982.) This survey undertaken in 1980 is now woefully out of date. Since 1980 community expectations, fleet mix and the number of flights has changed substantially to the extent that such an out-of-date survey completely undermines the validity of the ANEF/ANEC/ANEI. In the same period there have been 3 similar surveys in the UK and the US. SACF has been calling for a new survey to be undertaken since 2014 and has received the support of the authors of the original 1980 report – Dr Bullen and Professor Hede on the urgent need for a new survey. Yet there has been only obfuscation and refusal by the Department. One can only guess that they do not want to know the answer. It is imperative that the Aviation White Paper recognise that a new and updated dose response survey is very urgently required.
3. The ANEF is frequently criticised as being insufficiently responsive to increases in the number of flights. A doubling in the number of flights is treated by the ANEF as equivalent to a 3 dBA increase in average noise, yet a 3 dBA increase in noise is just perceptible to most people. Thus, a community exposed to 100 flights at 70 dBA is represented by the ANEF as being equally affected as a community exposed to 50 flights at 73 dBA. This defies common sense and lived experience of anyone affected by aircraft noise pollution. This problem could be solved by a new dose response survey and updating of the ANEF model to better reflect the effect of the number of flights that people experience.

What are appropriate, modern noise metrics that should be used to communicate aircraft noise impacts?

The most expert and succinct answer to this question is provided by Professor Hede in his response to the Western Sydney Airport, Draft EIS of 17 December 2015 when he states:

The community would be better informed if in addition to exposure information in terms of both ANEF/ANEC (down to 10 ANEF) and N70/N60 (down to 5 overflights), they were presented with contour maps displaying impact descriptors (viz., 10% seriously affected and 20% moderately affected) (see Hede, 1993; Hede & Williams, 1991).

An example of impact contours from the *Falling on Deaf Ears* report mentioned by Professor Hede is at Appendix A.

I also draw your attention to Professor Hede’s full response to the Western Sydney Airport, Draft EIS which is attached at Appendix B. It provides a thorough discussion on the ANEF, its use and misuse as well as better ways to communicate aircraft noise impacts.

How can governments better communicate with potential purchasers of properties which will be affected by aircraft noise in the future?

By publishing and making available the aircraft noise information as proposed above would facilitate better communication to potential purchasers, and to do so for both current actual aircraft noise as well as ultimate noise forecasts.

Do these processes provide sufficient opportunity for impacts on the community to be identified and taken into account? How can they be improved?

No, with the exception of the Long Term Operating Plan (LTOP) for Sydney Airport when it was first implemented, in practice, impacts on the community have only ever been taken into account as a second order consideration after operational efficiency and airport capacity. Certainly, for Sydney Airport this has been abetted by a process of incremental expansion, where each new change is simply measured against what is currently happening rather than the totality of change that has occurred.

This begs the question, what is an acceptable overall impact of aircraft noise on an individual and a community? How many flights and how much impact should affected communities be subject to before decision makers say 'enough is enough'. There is an urgent need to address this very pertinent policy question.

A significant problem is that current processes are often based on economic arguments to allow more aircraft to take off and land based on "efficiency" and economic benefit. But these arguments then ignore or down play the economic, social and health costs of aircraft noise pollution on the community. In economics these are called the 'negative externality' costs of aircraft noise pollution.

Aircraft noise is treated as a 'free-good' to be consumed without any real limit as far as airports and the aviation industry are concerned. Business cases are presented that talk about numbers of people affected (a very poor measure on its own) but don't quantify the economic cost to the affected community or describe the social cost in terms of what it actually means for the amenity and day to day lives of the people impacted. An economist, Dr Ernestine Gross has done some work in quantifying these costs at Sydney Airport. However, a properly funded model needs to be developed, based on her work that can be applied so that the economic costs of these negative externalities to the affected community are properly taken into account.

I would note also that people impacted by aircraft noise pollution are not themselves compensated for their loss of amenity, loss of value of their home or the adverse health effects that they suffer, perpetuating the idea that aircraft noise is a free good and distorting decision making in favour of airports and the aviation industry.

What can be done to proactively mitigate noise impacts by better informing residents and land-use planners?

Residents should be informed about any changes that are going to impact them. However, informing residents that they are or will be affected by more aircraft noise is not actually going to mitigate any of the noise impacts. Knowing about them in no way makes those impacts less severe. Informing land use planners however, would allow them to make planning decisions and apply appropriate zoning. The problem is that the vast majority of areas impacted by aircraft noise pollution are well established communities where land use planning is of limited application other than for new developments. This is particularly the case for Sydney Airport which is only 8km from the CBD and where planes are required to fly significant distances over long established urban areas, particularly when landing from and taking off to the north.

What else can airlines and airports do to support better management of aircraft noise?

This question ignores the key role that Airservices Australia plays in better managing aircraft noise along with airlines and airports. While the presence and configuration of an airport is the reason that there is aircraft noise imposed on communities, and it is the airlines that operate the aircraft, it

is Airservices that determines where those planes will fly. This is also a 'motherhood' question. It goes without saying that each of these organisations has a role to better manage aircraft noise, and each of these organisations needs to make better management of aircraft noise as a consequence of their activities their priority. However, without regulation the airlines and the airport will always put their commercial interests ahead of managing and mitigating the impacts of aircraft noise on the community. It would be naive to think otherwise.

What else can they do? In the case of Sydney the ongoing effectiveness of LTOP is critical to managing aircraft noise in a manner that is acceptable to the community. LTOP is the social contract between the community, the airport and airline industry. It is the commitment to fairly share the burden of aircraft noise at Australia's busiest airport by changing modes of operation so that aircraft fly over different parts of the city and by ensuring a spread of aircraft on any one flight track to the maximum degree possible. However, the non-parallel, noise sharing modes have lower capacities than the parallel modes of operation. Increasing demand is diminishing the use of the lower capacity noise sharing modes and therefore the effectiveness of LTOP to share the noise. This is shown in the Mode Use at Appendix C.

Unless something is done to better manage demand to within the LTOP constraints and to improve the capacity of the noise sharing modes to handle increased traffic LTOP will cease in the not-too-distant future to be an effective tool to manage and mitigate aircraft noise in Sydney. The cooperation and commitment of resources from all parties to investigate increasing the use of the noise sharing modes will be required, along with effective regulation to better manage demand at Sydney Airport to allow LTOP to operate as intended. This is discussed further under 'Improving Noise Management' later in this submission.

There are also aspects of LTOP that remain to be implemented – the 'Trident' aspect of Mode 10 (landings from the north) where arriving aircraft are separated on different arrival paths until on final approach; and, the 'high and wide' aspect of Mode 9 (departures to the north) where aircraft are flown off the coast rather than flying over suburbs. Some significant, albeit slow progress has been made in the Implementation and Monitoring Committee (IMC) on Mode 9 implementation, although there is still some way to go. Each of these organisations needs to commit to implementing these outstanding aspects of LTOP.

Could governance arrangements for the Aircraft Noise Ombudsman be improved to provide greater independence, including publishing its findings and reports?

From its creation there has been consistent criticism that having the Aircraft Noise Ombudsman report to the Airservices Australia Board creates a conflict of interest. Indeed, I am unaware of any instance where the Ombudsman has been critical of Airservices Australia. The most appropriate governance arrangements for the Aircraft Noise Ombudsman would be to report to the Commonwealth Ombudsman. This would ensure its independence from all organisations involved in aviation including the Department of Infrastructure, Transport, Regional Development, Communications and the Arts, which in addition to regulation and policy is also involved in decisions on aviation matters that impact aircraft noise such as Curfew Dispensations, and is also responsible for various aspects of aviation reporting. There is no reason that the funding arrangements for the Aircraft Noise Ombudsman need change with the change of governance arrangements.

However, there is also a perception that the Aircraft Noise Ombudsman role is just 'window dressing' and focused on reporting and consultation without achieving much in the way of actual meaningful change and improvement in aircraft noise outcomes. Publishing its findings and reports may help to address this if meaningful improvements have actually been made.

Are there opportunities to improve transparency by publishing information about other decisions made by CASA, Airservices or airports around flight paths, and how aircraft approach and depart airports?

Yes, transparency in decision making is a key aspect of a democracy. In addition, making publicly available source information such as secondary surveillance radar data, granular information on arrivals and departures and weather at airports would also provide transparency and accountability on operational decisions. Airservices Australia will not currently provide this information, although have in the past.

How can the flight path design principles be improved?

When Airservices Australia released its final June 2020 version of its Flight Path Design Principles which were published in October 2020 both myself and the Sydney Airport Community Forum (SACF) were highly critical of the changes that were made from their earlier June 2020 draft.

SACF stated in its conclusion:

The final Flight Path Design Principles provide little confidence that future flight paths across Australia will be designed in a manner that minimises the impact of aircraft operations on aircraft noise affected communities. They show a clear preference towards satisfying airport and industry objectives while only considering aspects of flight path design that provide community benefit after other priorities have been met.

Similarly, I concluded:

Unfortunately, the June 2020 version of Airservices Australia's Flight Path Design Principles falls way short of what is required for a balanced set of principles that reflect the importance of designing flight paths that minimise the effects of aircraft noise pollution on the community, while meeting safety and satisfying operational requirements. Disappointingly, the earlier January 2020 draft met these requirements much better, but the changes subsequently made have significantly diminished those draft Flight Path Design Principles that deal with Noise and Community Impact, ensuring that they will now be largely ineffective.

The Flight Path Design Principles need to recognise the lessons that have been learned in Sydney which are that aircraft noise pollution impacts are managed and minimised through noise removal, relocation, reduction, respite, avoiding reciprocity and sharing unavoidable residual noise by fairly distributing it over a wide area. These lessons were to a much larger extent reflected in the earlier January 2020 Draft Flight Path Design Principles than the final Flight Path Design Principles that have been published. To improve the Flight Path Design Principles the earlier draft June 2020 version, with only some minor amendment needs to be adopted. Copies of the June 2020 Flight Path Design Principles along with the my personal and SACF submissions are attached at Appendices D, E and F.

Are CACGs working for the community? What are good aspects, and what can be improved?

It is noted that other than in a footnote the Sydney Airport Community Forum (SACF) is not mentioned in the Green Paper and nor is the Implementation Committee. They should be.

SACF was set up by the Minister for Infrastructure and Transport in July 1996 to address the impacts from Sydney Airport in the wake of the huge public outcry over aircraft noise with opening of the Third Runway. It includes representatives from the Community, Local Councils, Industry, and State and Federal Parliaments. SACF is the primary consultative committee on Sydney Airport. The role of SACF is to:

- provide advice to The Minister, Sydney Airport Corporation and aviation authorities on the abatement of aircraft noise and related environmental issues at Sydney Airport, and
- provide advice to aviation authorities to facilitate improved consultation and information flows to the community about the Airport's operations.

SACF is not a CAG. It has a chair appointed by the Minister rather than being chaired by the Airport with the inherent conflict to interest that this involves. Unlike a CAG which deals with incidental issues SACF's focus is aircraft noise. Although there have been attempts over the years to replace SACF with a CAG this has been resisted. SACF's independence from the Airport, its community, industry and political membership have made it much more responsive and effective than CAGs in addressing the most pressing issue for the community, aircraft noise. Indeed, leading up to the last Federal election Brisbane based Labor Party MPs called for the establishment of an Airport Community Forum for Brisbane like SACF. While the unique issues with aircraft noise in Sydney need to be recognised, the establishment of similar forums could be considered for airports in addition to Sydney.

However, to be most effective SACF and its community representatives do need independent expert assistance to carry out their responsibilities. Aircraft operations and noise are highly technical and complex issues and the community members are only volunteers. Previously such assistance was provided by an Aviation Community Advocate (ACA) whose role was to independently advocate the interests and views of the community on aviation matters and aircraft noise at Sydney Airport, provide independent research and advice, and to develop proposals for policy and procedural changes regarding Sydney Airport and its aviation operations. Importantly, the ACA was also able to participate in and draft submissions and responses on behalf of SACF to the frequent inquiries, master plans, green papers, white papers, working groups and various proposals providing informed input to these, allowing the community's voice to be better heard. Unfortunately, this role was discontinued and despite repeated calls for it to be reinstated this has not occurred. For SACF to carry out its role most effectively it is imperative that the ACA position be reinstated. This role would also be very beneficial for communities impacted by airport operations and aircraft noise in other cities.

Improving Noise Management at Sydney – Restoring the Balance

The Aviation Green Paper (p 82) mentions the ICAO Balanced Approach and Airservices Australia's approach to aircraft noise management which includes noise sharing and respite along with acknowledging that regulators and lawmakers have a key role with their ability to place operational restrictions on airport activities. The basis for noise management in Sydney is a curfew, a cap of 80 movements per hour and the LTOP to share the burden of aircraft noise pollution from the operations of Sydney Airport. This plan prescribes a runway selection procedure that has the higher capacity parallel runways preferred only in peak periods and other runway configurations, referred to as the noise sharing modes, used outside of the peak (see Appendix G). However, as demand for the airport has risen, the use of the lower capacity noise sharing modes of operation has declined, and the use of parallel operations has increased such that they are being used well outside the designated peak periods. This undermines noise sharing and imposes an ever-increasing aircraft noise burden on populations north and south of the airport, which the plan was specifically designed to avoid.

With the opening of the Western Sydney International Airport in 2025 there is an opportunity to ensure the on-going viability of noise sharing in Sydney by putting demand management mechanisms in place at Sydney whereby the Minister nominates lower movement caps outside of the peak periods to enable the LTOP preferred noise sharing modes to be used and noise sharing

objectives to be met. Flights that could not be accommodated within the lower off-peak caps at Sydney would be able to use Western Sydney airport thus ensuring that the overall aviation capacity of the Sydney basin is maintained. This would allow LTOP to function as originally intended and to restore the balance between the demands of the aviation industry and the noise impacted community at Sydney Airport as well as having the additional benefit of improving the success of the new Western Sydney International Airport.

Conclusion and Recommendations

This submission has sought to answer some of the specific questions asked by the Aviation Green Paper. In doing so it has become apparent that the Green Paper has failed to address the most pressing problem with airport operations, and that is doing something that will actually improve the problem of aircraft noise pollution for existing affected communities. Improved consultation and information, which in one form or another is what most of the questions are about, is simply papering over the cracks and does not address the real need for something to be done.

While the Green Paper acknowledges that the policy is for a balanced approach to aircraft noise management, in practice this has meant the community having to accept ever more aircraft noise rather than restrain by the airport or airlines. The costs to the affected community are not quantified and are downplayed in the decision making relative to economic arguments that benefit the airport and airlines. There is a desperate need for a proper balance to be achieved between the competing demands of the airport and industry and the community.

This submission has some key recommendations that in addition to addressing general deficiencies in the discussion around aircraft noise need to be included in the White Paper. These are:

1. Urgently undertake a new and updated dose response survey to replace the out of date 1980 NAL survey that underpins the ANEF.
2. Update the ANEF model to better reflect the relative effect of the number of flights that people experience.
3. Present ANEF/ANEC down to 10 ANEF, N70/N60 down to 5 overflights, and produce contour maps displaying impact descriptors (viz., 10% seriously affected and 20% moderately affected etc.) as metrics that can be used to better describe aircraft noise impacts.
4. Determine what is an acceptable overall impact of aircraft noise on an individual and a community.
5. Develop an economic model that properly quantifies the economic costs of aircraft noise as a 'negative externality' so that this can be considered in decision making.
6. Improve the capacity of noise sharing modes at Sydney Airport to increase their use and implement the outstanding aspects of LTOP.
7. Have the Aviation Ombudsman report to the Commonwealth Ombudsman to improve its independence.
8. Making publicly available source information such as secondary surveillance radar data, granular information on arrivals and departures and weather at airports to provide transparency and accountability on operational decisions.
9. Use the earlier draft June 2020 version, with only some minor amendments to improve the Flight Path Design Principles.
10. Recognise the role of SACF and consider similar forums for other airports.

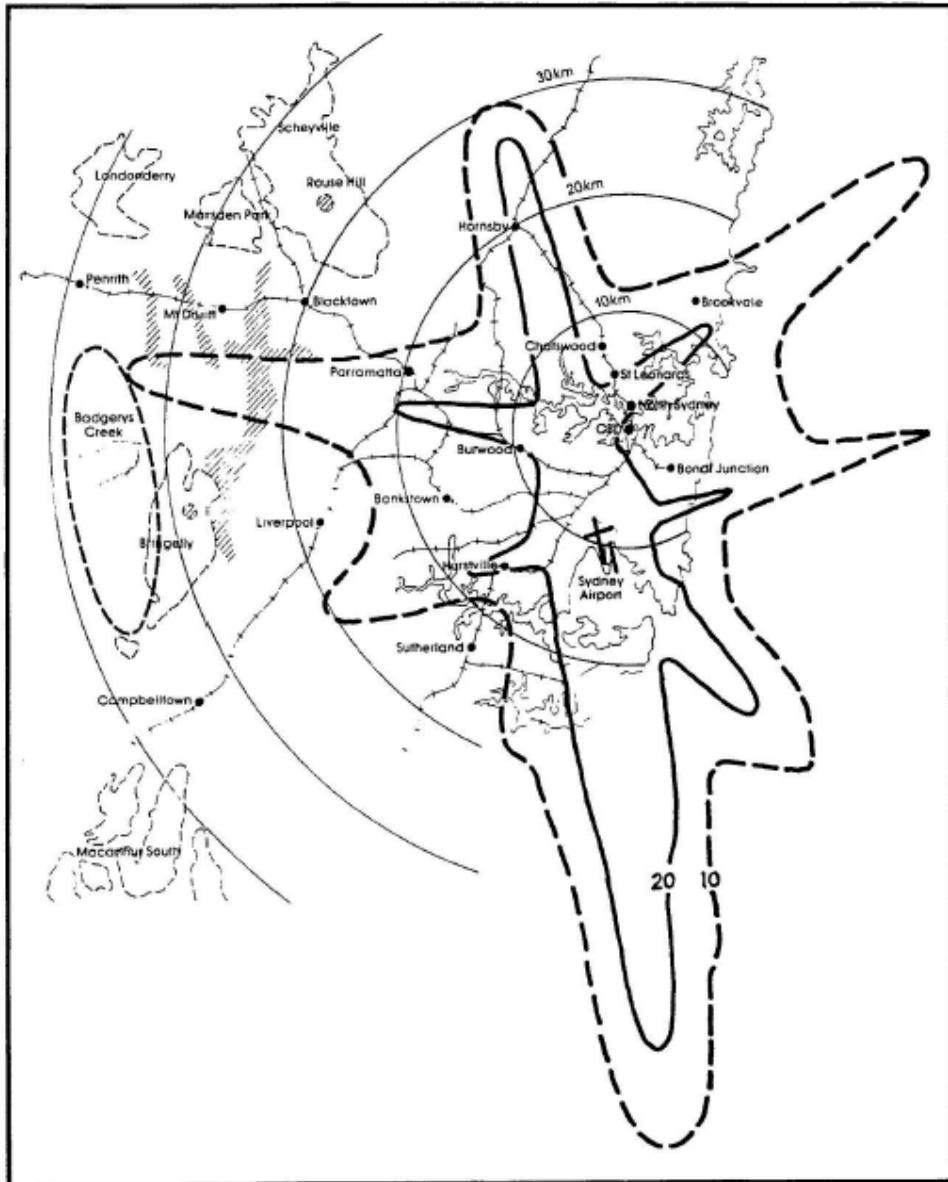
11. Reinstate the Aviation Community Advocate as an essential support for SACF and the community in Sydney and possibly at other airports.
12. Put in place demand management mechanisms at Sydney Airport to lower movement caps outside of the peak periods to enable the LTOP preferred noise sharing modes to be used and noise sharing objectives to be met.

Appendices

- A. Aircraft Noise Impact Indices.
- B. Hede, A. Submission re Western Sydney Airport Draft EIS, 17 December 2015
- C. Sydney Airport Mode Use, October 2023
- D. Airservices Australia Draft Flight Path Design Principles, January 2020
- E. Clarke, J Submission on Airservices Australia Draft Flight Path Design Principles
- F. SACF Submission on Airservices Australia Draft Flight Path Design Principles
- G. Sydney Airport Preferred Runway Selection

SYDNEY AIRPORT (KSA) - ULTIMATE CAPACITY

aircraft noise exposure at which 10% and 20% of people will be moderately affected



Submission re Western Sydney Airport Draft EIS

Andrew Hede, Professor Emeritus, Social Research Consultant

Focus of Submission

The Minister for Infrastructure and Regional Development released the draft Environmental Impact Statement (EIS) for the Western Sydney Airport (WSA) on 19th October 2015 and invited submissions by 18th December 2015. This submission (dated 17th December 2015) is made in response to that invitation (see Note 1).

The present submission focuses exclusively on aircraft noise issues in the Western Sydney Airport Draft EIS. The relevant documents addressed are: 1) Vol.3, Ch.31 – *Noise*; 2) Vol.4, App.E1, Technical Report No.14168 – *Aircraft Overflight & Operational Noise*.

Four major problem areas are identified. As well as analysing the problems in these four areas, this submission provides recommendations on how they can be overcome before the assessment of the proposed project is finalised, specifically, in the scheduled EIS Supplement:

1. The first key problem area concerns the ANEF index. This research-based measure of aircraft noise exposure has been widely misunderstood and misapplied over the past several decades and that continues in the present Draft EIS.
2. The second major problem is that the Draft EIS completely fails to meet its obligations to assess the community impact of aircraft noise around the proposed airport.
3. The third problem is that the Draft EIS does not account for the special effect of the ‘new noise’ expected from the proposed airport despite this effect being widely acknowledged.
4. The fourth problem with the Draft EIS is that it relies on an outdated model for calculating aircraft noise exposure around the proposed Western Sydney Airport.

Note 1: The author of this submission, **Dr Andrew Hede**, is a reputed expert in the area of community reaction to aircraft noise. As a research psychologist, he was the lead researcher in the early 1980s on the National Acoustic Laboratories study which developed the ANEF index and the associated dose-response graph for aircraft noise in Australia (ref., Hede, AJ & Bullen, RB, 1982, *Aircraft Noise in Australia: A Survey of Community Reaction*, National Acoustic Laboratories Report No. 88, Australian Government Publishing Service, Canberra). As a university professor for the past 25 years, Dr Hede has continued to specialise in social survey research. His research credentials are available at: www.researchgate.net.

Problem Area 1: Misapplication of ANEF

As any critical review would show, the WSA Draft EIS does not take appropriate account of the lessons from the failure of the Sydney Airport Third Runway EIS in the 1990s. The public outcry over that EIS led to an extensive investigation by a Senate select committee which made a number of important recommendations that have been ignored in the present Draft EIS (see Senate Select Committee, *Falling on Deaf Ears*, 1995).

The *Falling on Deaf Ears* report criticised the Third Runway Draft EIS for inappropriately applying ANEF. That report stated that “*the criteria for land-use were used to limit the discussion of noise impact and people were misled about the likely noise impact*” (Senate Select Committee, 1995, p.E11). Twenty years later, this same criticism can be levelled at the current WSA Draft EIS.

- Contrary to widespread misunderstanding, ANEF (Australian Noise Exposure Forecast) as distinct from its various practical applications (commonly called ‘the ANEF system’), is a research-based index or composite measure which by the nature of aircraft noise plus the nature of human reaction, is justifiably complex.
- ANEF was derived from the results of the National Acoustic Laboratories (NAL) definitive study around five Australian airports in 1980 (see Hede & Bullen, 1982). As an ‘equal-energy’ index, ANEF is comparable to the Noise Exposure Forecast (NEF) developed in the US and currently used in Canada, identical except for the Australia-validated night and evening weightings in ANEF (Bullen & Hede, 1983).
- Australia’s original NAL study is regarded by researchers throughout the world as a reliable source of data on community reaction to aircraft noise (e.g., Fidell et al., 2011; Fidell, 2003; Miedema & Vos, 1998). Indeed, the NAL data from 1980 has been archived in a database available for international research comparing community reaction across countries and over time (see Janssen et al., 2011).
- Thus, the Draft EIS is correct but misleading when it states without amplification that the ANEF index is “*not used outside Australia, and is therefore not generally used in describing the findings of overseas research*” (WSA Draft EIS, Vol.4, App.E1, p.15). Rather than being in any way idiosyncratic or irrelevant as implied by this statement, ANEF is demonstrably comparable to the various aircraft noise indices currently used in the major developed countries (see Burton, 2004).

- The original NAL research established that out of more than 50 indices that were statistically evaluated, the ANEF index is the most accurate predictor of community reaction to aircraft noise in Australia (Bullen & Hede, 1983; Hede & Bullen, 1982).
- Nevertheless, it is indisputable that after more than three decades with so many developments in aviation technology and operations as well as major changes in community expectations, there is now an urgent need to re-evaluate the findings of the 1980 NAL study by commissioning new social surveys around Australia's airports as has recently been undertaken in comparable countries overseas.
- For example, in late 2014 the Port Authority of New York and New Jersey announced allocating \$8million to commission new social surveys around JFK and LaGuardia airports in order to determine current community reaction to aircraft noise (Port Authority of New York and New Jersey, 2014).
- This view about the need for an update of the original 1980 NAL research was expressed twenty years ago in the *Falling on Deaf Ears* report (Senate Select Committee, 1995). A further twenty years on, such a study must be considered a pressing priority for the Australian Government today.
- The *Falling on Deaf Ears* report showed that despite its solid research credentials, ANEF has limitations as a public information source because it is poorly understood by the community, especially when it is presented in the form of noise exposure contours which cover only part of the areas significantly impacted by aircraft noise (i.e., only areas above 20 ANEF) (see Senate Select Committee, 1995).
- A subsequent Government discussion paper (Department of Transport and Regional Services, 2000) recommended presenting community members with exposure information in terms of indices such as N70 which they can understand more readily as relating to their own direct experience (viz., number of noisy overflights). This recommendation has evidently been adopted in the current Draft EIS which presents numerous maps displaying N70 and N60 contours.
- The present submission applauds the WSA Draft EIS for its extensive use of such contour maps which display exposure around the proposed airport in terms of the number of overflights above 70 dBA (or 60 dBA) in six zones ranging from 5-10 up to 200+. The Draft EIS also does well to provide the community with contour maps showing maximum dBA levels from single overflights by specific aircraft types.

- It is an uncontested fact, of course, that such ‘number above’ indices ignore the amount by which overflights exceed the defined benchmarks (viz., 60 dBA or 70 dBA). To cite one typical example with N70, this index assumes that 10 overflights with noise levels peaking at 70 dBA are equal in aircraft noise exposure to 10 identical overflights peaking at 80 dBA despite the fact that the latter overflights would each be perceived by residents as being *twice as loud*.
- While ‘number above’ indices suffer from the preceding problem, ANEF and other comparable indices such as DNL (US), NEF (Canada) and LAeq (UK), are subject to what we might term the ‘*equal-energy paradox*’. This phenomenon has not been fully explained in the research literature but is well known in the community.
- Essentially, the equal-energy paradox means that although repeated social surveys around the world over the past four decades have found that residents respond to aircraft and other transportation noise sources mainly on an equal-energy basis (Fidell, 2003; Fidell et al., 2014), anecdotal evidence suggests that they react more directly to the number of noisy overflights (see Senate Select Committee, 1995).
- Compare, for example, two residential situations around a major airport: Suburb A is exposed to 100 overflights per day averaging a peak level of 75dBA; Suburb B has an exposure of 50 overflights with an average peak of 78dBA. Assume for this example that overflight duration is equal in the two situations. For residents in both suburbs the overflights are experienced as ‘noisy’ but Suburb B’s 78dBA events are perceived as ‘*just noticeably*’ (=3dBA) louder than the 75dBA events in Suburb A.
- If you asked the average informed resident which aircraft noise exposure pattern they would prefer, most would opt for the Suburb B situation (i.e., half as many overflights with each ‘just noticeably’ louder) (see Senate Select Committee, 1995, pp.183 & 200). However, if you conducted a best-practice scientific social survey, the results would almost certainly confirm the findings of the hundreds of social surveys now on record worldwide that indicate that the two situations would be reported by residents as equivalent (see Fidell et al., 2014; Fidell et al., 2011).
- Such a paradox can be resolved only by new research focussed on the specific problem, namely: *what is the relative contribution of average noise energy versus number of noisy events in how residents in Australia react to aircraft noise?* Unless the Australian Government initiates such research, this paradox will continue to impose a burden on communities including those around the proposed new airport.

- It is clear that no single index or measure will suffice but rather that the Australian community needs to have a range of different exposure and impact information if they are to fully comprehend how an aircraft noise proposal would affect them.
- The previously-mentioned Government discussion paper also lobbied against using ANEF as an information tool by advocating that the practical application of ANEF should be confined to land-use planning where it “*continues to be the most technically complete means of portraying aircraft noise exposure*” (Department of Transport and Regional Services, 2000, p.v).
- This perspective was later elaborated as follows: “*The Australian Noise Exposure Forecast (ANEF) system remains the fundamental tool for achieving land use compatibility around airports in Australia.*” (Southgate, 2011, p.2; emphasis added).
- This land-use planning application of the ANEF index refers to the Australian standard *AS 2021:2015* on aircraft noise (ref., Standards Australia, 2015). This standard lists the ANEF cut-offs approved for building siting. Specifically, it provides a table prescribing that areas of less than 20 ANEF are considered ‘acceptable’ for such listed building types as ‘house’, ‘school’, and ‘hospital’ (see Standards Australia, 2015, Table 2.1, p.12).
- While this aircraft noise standard is generally regarded as functioning well in land-use planning (see Department of Transport and Regional Services, 2000), it appears that it has inadvertently contributed to the community confusion about ANEF.
- By misapplying land-use planning information and restricting aircraft noise exposure contours and population data only to areas above 20 ANEF, there is evidence of instances of misinformation over the past two decades that have confused the Australian community (see Senate Select Committee, 1995).
- The root of this confusion seems to be the word ‘*acceptable*’. The Australian standard uses the term only to mean acceptable for specified land uses (e.g., less than 20 ANEF is rated as ‘acceptable’ for new residential development). However, public officials and community members often misinterpret this to mean that less than 20 ANEF is an ‘acceptable’ amount of aircraft noise and by implication, that this amount of noise is ‘insignificant’ or ‘negligible’.
- For example, the *Falling on Deaf Ears* report cites an official Department of Transport and Communications pamphlet from 1989 asserting that “*Noise exposure*

less than 20 ANEF is not a problem for most people” (Senate Select Committee, 1995, p.205; emphasis added).

- That report also cites several examples of distortion (presumably unintended) concerning 20 ANEF such as the following official letter from the then Department of Transport: *“As you can see from the attached Australian Noise Exposure Index (ANEI) map Baltimore Road is situated outside the 20 ANEI contour. Aircraft noise is therefore objectively assessed as being insignificant and the area suitable for residential use”* (Senate Select Committee, 1995, p.205; emphasis added).
- It is noteworthy that the term ‘acceptable’ was used in the original NAL report which stated that a value of 20 ANEF is *“an ‘excessive’ amount of aircraft noise – more than is acceptable or desirable in a residential area”* (Hede & Bullen, 1982, p.154; emphasis added). With hindsight, this was perhaps an unfortunate choice of term as it has seemingly been widely misinterpreted in the intervening years.
- Unfortunately, the community’s confusion re ANEF was not rectified in the latest revision of AS 2021 which was released in early 2015. The new standard repeats the following misleading statement from the previous version dated 2000: *“However, it should not be inferred that aircraft noise will be unnoticeable in areas outside the ANEF 20 contour”* (Standards Australia, 2015, p.11; emphasis added).
- The expression ‘not... unnoticeable’ in this context is regrettable in that it clearly minimises the significant impact of aircraft noise below 20 ANEF as established by empirical research (see Hede, 1993; Hede & Bullen, 1982). To deem as ‘not unnoticeable’ a level of aircraft noise exposure where up to 45% of residents will be moderately affected (see Figure 1), is surely misleading or at least inadequate.
- It is apparent that the current WSA Draft EIS accepts the view that if the community is to fully understand how they would be affected by any proposed aircraft noise, they need to be presented with contour maps displaying exposure in terms of *both* the N70/N60 and the ANEF indices. Indeed, both are employed in the Draft EIS albeit more extensively in the case of the former index.
- However, although the WSA Draft EIS displays N70 and N60 contours down to 5 overflights, it displays ANEF contours *only* down to the 20 level, thereby confusing the community about what constitutes significant exposure and perpetuating the distortion that any aircraft noise below this level is ‘acceptable’ or ‘negligible’ for residents (as shown above).

Recommendations re Problem Area 1: Misapplication of ANEF

- 1.1** Action is needed in the scheduled EIS Supplement on Western Sydney Airport to provide the community with dual-index exposure information on aircraft noise exposure (viz., in terms of both N70/N60 *plus* ANEF). Such information must be *comprehensive* as well as *accurate* so as to ensure that the current airport proposal does not become another instance of misinformation and avoidable community confusion (see Note 2).
- 1.2** The Senate Select Committee in 1995 showed that the Australia-validated aircraft noise exposure index ANEF, was being misapplied insofar as its role in land use via the Australian standard (*AS 2021*) was being distorted when applied in environmental assessment such that it underestimated aircraft noise. The present submission has shown that such distortion, albeit unintended, continues in the current Draft EIS and needs to be corrected.
- 1.3** While the WSA Draft EIS does well to display aircraft noise exposure in terms of N70 and N60 contours down to 5 overflights, its maps of ANEC (=ANEF) down to only 20 ANEF continue to distort the actual noise exposure thereby exacerbating community confusion. It is recommended that the EIS should be amended by plotting these contours in 5-ANEF steps down to 10-15 ANEF.

Note 2: In Table 31-7, the left-hand column listing ANEC contours is incorrectly labelled as 'N70' (see Draft EIS, Vol.3, Ch.31, p.42).

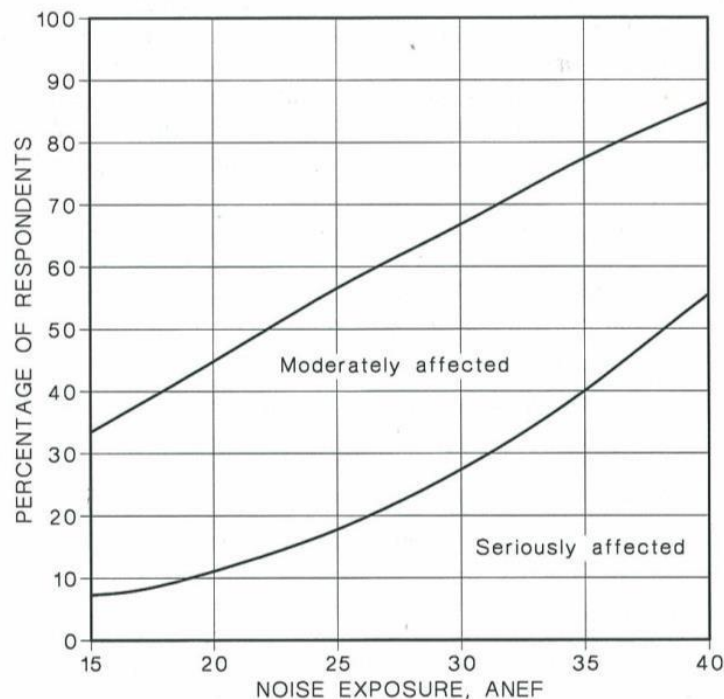
Problem Area 2: Failure to Assess Community Impact

In contravention of the requirements of the official EIS Guidelines (see Department of Infrastructure & Regional Development, 2014), the Western Sydney Airport Draft EIS fails to adequately describe and report on the *impact of aircraft noise* on residential communities around the proposed airport.

- The EIS Guidelines for Western Sydney Airport (WSA) state: “*The EIS should enable interested stakeholders and the Minister to understand the environmental consequences of the proposed development*”; and further: “*The EIS must include a description of all the relevant impacts of the action*” (EIS Guidelines, pp.1 & 5; emphases added).
- On any reasonable interpretation, the significant psychological effects of aircraft noise on residents around the proposed airport would surely qualify as a ‘relevant impact’ under the official EIS Guidelines.
- The core problem appears to be that the WSA Draft EIS repeatedly misuses the term ‘impact’ to refer to ‘exposure’ which is an entirely distinct concept. On the very first page of the technical report on noise, the Draft EIS states: “*Noise impact from aircraft in flight and operating on the runway is assessed in this study in terms of a number of measures, including the following descriptors...*” (WSA Draft EIS, Vol.4, App.E1, p.1; emphasis added). However, the four ‘descriptors’ then listed are all measures of aircraft noise *exposure* rather than of aircraft noise *impact*.
- Aircraft noise *exposure* correctly refers to the *amount* and *extent* of physical noise energy from aircraft operations around an airport (see Burn, Stusnick & Ehrlich, 1995; Fidell et al., 2011). Aircraft noise exposure can be appropriately measured by means of various types of index including those used in the Draft EIS, namely, the ‘equal-energy’ index ANEF (=ANEC) and the ‘number above’ index N70 (+N60).
- Aircraft noise *impact*, on the other hand, refers to the *effects* or *consequences* of noise exposure (Borst & Miedema, 2005; Brink et al., 2010; Kroesen & Schreckenberg, 2011). It is generally agreed that the most critical and widespread impact of aircraft noise is that on residential communities (Fidell et al., 2014). Such impact can be best described in terms of the percentages and numbers of residents annoyed or affected to various degrees by aircraft noise around an airport (Schomer, 2005). Nevertheless, community *impact* is ignored in the WSA Draft EIS.

- Twenty years ago, the *Falling on Deaf Ears* report cited an article which advocated the need for ‘*impact descriptors*’ in addition to ‘*exposure indices*’ in environmental assessment (Hede, 1993, cited in Senate Select Committee, 1995, p.202). Such a dual-information approach enables a community to better evaluate the effects they are likely to experience in residential areas around a proposed airport.
- In order to accurately describe the impact of aircraft noise one needs firstly to measure the amount and extent of noise (the dose) using a suitable aircraft noise exposure index. Secondly, one needs to estimate how much the community is affected by the various levels of aircraft noise exposure (the response). This requires ‘*dose-response*’ data to estimate the numbers of residents seriously or moderately affected in each aircraft noise exposure zone (see Table 1.2 below).
- The following dose-response graph (Figure 1) is presented in the Western Sydney Airport Draft EIS (Vol.4, App.E1, p.16). It is derived from National Acoustics Laboratories Report No.88 (Hede & Bullen, 1982, p.153) as reproduced in the Australian standard on aircraft noise (Standards Australia, 2015, Figure A1, p.140).

Figure 1: Relationship Between ANEF and Percentage of People ‘Seriously Affected’ and ‘Moderately Affected’ by Aircraft Noise



NOTE: This graph was derived from the National Acoustic Laboratories Report No. 88.

- The above dose-response graph can be applied in environmental impact assessment by firstly deriving a table depicting the percentages of residents affected by the various levels of aircraft noise exposure (see Table 1.1 below).

Table 1.1: Estimates of percentages ‘seriously affected’ and ‘moderately affected’ (as derived from figure presented in Western Sydney Airport Draft EIS [see Figure 1 above] with extrapolation beyond 15 ANEF; estimated accuracy +/- 1%).

ANEF	10	15	20	25	30	35	40
% Seriously Affected	6	7	11	18	27	40	55
% Moderately Affected	22	34	45	56	67	77	86

NOTE: Ideally, the above values would be derived from mathematical functions for the two curves in the NAL dose-response graph. This table should suffice until such functions are issued.

- The next step in assessing aircraft noise impact is to use the table of dose-response values (see Table 1.1 above) to derive a table of percentages seriously and moderately affected for each ANEF zone as shown in Table 1.2 below.

Table 1.2: Estimates of percentages ‘seriously affected’ and ‘moderately affected’ across ANEF zones (as derived from Table 1.1, using averages of dose-response values for endpoints of each ANEF zone).

ANEF ZONE	10-15	15-20	20-25	25-30	30-35	35-40
% Seriously Affected	7	9	15	23	34	48
% Moderately Affected	28	40	51	62	72	82

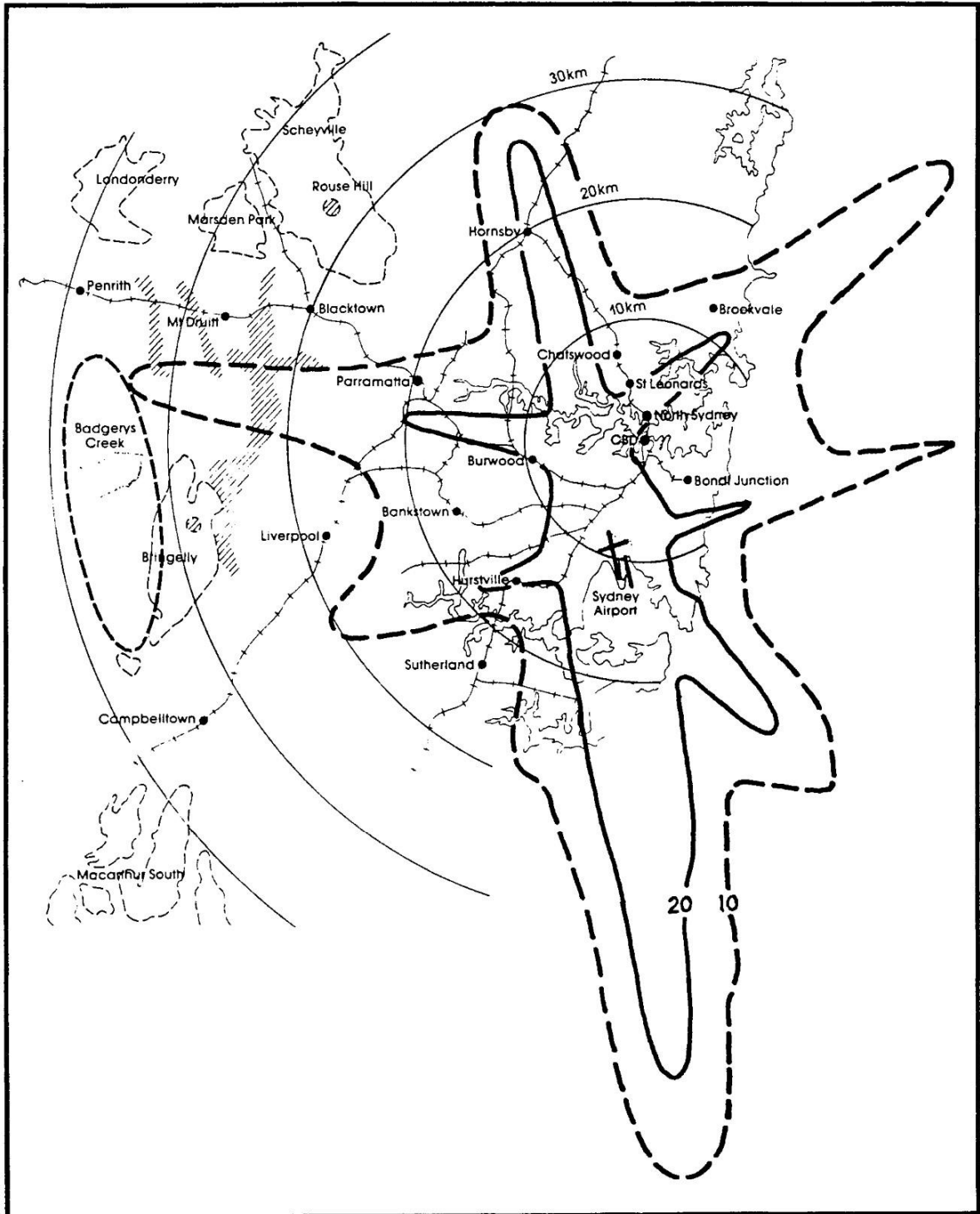
- The final step in estimating community impact is to multiply accurate estimates of the population residing in each ANEF zone by the percentages affected in each zone (see Table 1.2). Totals can then be tallied for numbers ‘seriously affected’ and ‘moderately affected’ for the whole airport or for particular areas of interest (e.g., specific suburbs, individual flight paths, etc.).

- The WSA Draft EIS fails to follow the above simple steps for accurately estimating aircraft noise impact. By contrast, the *Falling on Deaf Ears* report noted that the Sydney Airport Third Runway Draft EIS used the NAL dose-response graph in its calculations of numbers seriously and moderately affected down to 15 ANEF (Senate Select Committee, 1995, p.201). It is clear, therefore, that there has been a serious deterioration in the reporting of impact between the Third Runway Draft EIS in 1990 and the WSA Draft EIS in 2015.
- Notwithstanding the above, the present Draft EIS does provide counts of the estimated population who would be exposed to various amounts of noise around the proposed airport. The population counts in terms of N70 and N60 contours appropriately include exposures down to 5-10 overflights.
- Ironically, there are several instances where the counts of population *exposed* are referred to as population *affected*. For example, one table listing the population within the various N70 contours is described as follows: “*The residential population estimated to be affected by aircraft noise above 70 dBA by 2050 is outlined in Table 31-3*” (Draft EIS, Vol.3, Ch.31, p.28; emphasis added).
- On the other hand, the few population counts that the Draft EIS provides in terms of ANEC (=ANEF) contours cease at 20 ANEC. This gives rise to a clear implication that the residential population outside 20 ANEC literally and metaphorically *does not count* in the assessment of aircraft noise impact.
- For example, residents who would be exposed to 15 ANEF/ANEC around the proposed airport do not even warrant a mention in the Draft EIS despite the fact that it can be reliably predicted from the original NAL study (Hede & Bullen, 1982) that 7% of them would be seriously affected by the noise with 34% moderately affected (see Table 1.1 above).
- When it comes to communicating impact information to the community, previous experience has shown that exposure contours can be confusing, especially if the lowest level they depict is not the lowest level at which there is significant impact (viz., 20 ANEF as in the WSA Draft EIS; see discussion above).

Figure 2: Example of impact descriptors (Senate Select Committee, 1995, p.204)

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aircraft noise exposure at which 10% and 20% of people will be moderately affected



- The community would be better informed if *in addition to* exposure information in terms of *both* ANEF/ANEC (down to 10 ANEF) and N70/N60 (down to 5 overflights), they were presented with contour maps displaying *impact descriptors* (viz., 10% seriously affected and 20% moderately affected) (see Hede, 1993; Hede & Williams, 1991). An example of impact contours from the *Falling on Deaf Ears* report is shown in Figure 2 above.

Recommendations re Problem Area 2: Community Impact (see Note 3)

- 2.1** The EIS process for Western Sydney Airport cannot be considered satisfactory until community impact as well as aircraft noise exposure, has been properly assessed and reported in terms of both ANEF and N70/N60.
- 2.2** It is recommended that an accurate assessment of community impact requires the EIS to report the numbers of residents ‘*seriously affected*’ and ‘*moderately affected*’ in each ANEF zone down to and including 10-15 ANEF.
- 2.3** If the community is to have full access to information about aircraft noise impact, they should be provided with contour maps displaying impact contours in addition to exposure contours (viz., plots of 10% seriously affected and 20% moderately affected; see Hede, 1993) as recommended by the *Falling on Deaf Ears* report (Senate Select Committee, 1995).

Note 3: It is acknowledged that the Western Sydney Airport Draft EIS contains a separate technical report on ‘*Community Health*’ (Volume 4, Appendix G). This includes a health risk assessment (HRA) on aspects of aircraft noise impact that are beyond the scope of the present submission, namely: “*sleep disturbance (as awakenings), increases in ischaemic heart disease and impacts on cognitive development and learning in children*”. (WSA Draft EIS, Vol.4, App.G, p.vi).

Problem Area 3: Failure to Account for ‘New Noise’

One of the key lessons from the Sydney Airport Third Runway investigation was that residents exposed to new noise from aircraft operations are more adversely affected than is predicted by existing measures of long-term exposure and impact such as ANEF (Senate Select Committee, 1995, pp.188ff).

There is considerable recent research evidence that community reaction to a *change* in noise exposure (such as the new noise from a new airport or from a new runway configuration) is significantly higher than that indicated by established dose-response graphs which are based on long-term stable exposure (see Brink et al., 2008; Brown & van Kamp, 2009a, 2009b; Fidell, Silvati & Haboly, 2002; Hatfield et al., 2001; Laszlo et al., 2012). The clear implication of such research is that allowance must be made for this ‘new noise’ effect if aircraft noise impact is to be accurately estimated when assessing the environmental consequences of changes regarding airports.

- The *Falling on Deaf Ears* report cites evidence from Dr R Bullen who oversaw the present WSA Draft EIS noise assessment, to the effect that: *“the additional noise reaction associated with a new source can be estimated to be the equivalent of at least an additional 8dB in noise exposure”* (Senate Select Committee, 1995, p.191).
- In fact, the present WSA Draft EIS acknowledges that new noise is more disruptive than pre-existing noise when it states: *“Reaction to newly-introduced aircraft noise is known to be greater than the reaction of a community that has been exposed to the noise for some time.”* (WSA Draft EIS, Vol.4, App.E1, p.15). Despite this admission, the Draft EIS does not take account of this ‘new noise’ effect.
- By contrast a ‘new noise’ penalty of 5dB was accepted as appropriate by the EIS Supplement for the Sydney Airport Third Runway (ref., Vol.1, p.22; cited in Senate Select Committee, 1995, p.190). As with the reporting of aircraft noise exposure and impact outside the 20 ANEF (see Problem Area 2 above), we again see a significant deterioration of impact assessment standards between the Third Runway EIS more than twenty years ago and the WSA Draft EIS today.
- Considering the above points, it would seem appropriate for a ‘new noise’ penalty of 6dB to be added to ANEF calculations for all overflights around the new Western Sydney Airport. This matches the research-based penalty of 6dB currently used in

ANEF for evening and night noise to account for residents' increased aircraft noise reaction at these times.

- Regarding timeframe, the Third Runway EIS Supplement specified that a 'new noise' penalty should apply for only one to two years. However, the *Falling on Deaf Ears* report cites several acoustics experts, including Dr R Bullen, as stating that the penalty should remain in place for as long as seven years (Senate Select Committee, 1995, p.190; emphasis added).
- Rather than relying on such widely divergent speculative time periods for the 'new noise' penalty, it would seem more prudent to commission new empirical research in order to obtain a definitive answer for such a critical-impact project as the proposed new airport.
- Thus, if the Western Sydney Airport proceeds, the proposed 6dB 'new noise' penalty should ideally remain in place until such time as socio-acoustic research has confirmed that community reaction has decreased to the established long-term levels specified in the official ANEF dose-response graph (see Figure 1 above; as presented in Standards Australia, 2015, Figure A1).
- Such research would require a longitudinal social survey of at least 600 residents sampled across five ANEF zones around the new airport (viz., 10-15, 15-20, 20-25, 25-30 and 30+). After an initial face-to-face interview, respondents would need to be re-interviewed annually but this could be done by telephone at lower cost.
- However, an intrinsic methodological problem with all longitudinal social surveys is that of retaining respondents over successive interviews (Moser & Kalton, 1985). Attrition could be as high as 50% after several years.
- This problem is exacerbated when respondent attrition is partly caused by a key variable under investigation. In the case of a new airport such as WSA, it can be reliably predicted that an indeterminate proportion of residents will move out of the area because they are adversely affected by the new noise. Unless their reaction is included in the survey results, the overall effect of new noise will be significantly distorted.
- Specific steps would need to be taken to address such methodological issues in the proposed social survey. Because of the complexity of the methodology, an independent 'methodology auditor' should be appointed to oversee the longitudinal study and ensure that the results are valid and reliable.

Recommendations re Problem Area 3: ‘New Noise’

- 3.1** It is recommended that a ‘new noise’ penalty of 6dB be added to ANEF calculations for all overflights around the new Western Sydney Airport.
- 3.2** This ‘new noise’ penalty should remain in place until such time as a new longitudinal socio-acoustic study has shown that community reaction around the airport has stabilised at established and accepted long-term levels (ref., Standards Australia, 2015, Figure A1).
- 3.3** Such a longitudinal study should be required as a condition of any approval for the proposed Western Sydney Airport. Further, because of the research complexity of such a study, an independent ‘methodology auditor’ should be appointed to oversee the social survey and thereby ensure the validity of the results.

Problem Area 4: Use of Outdated Noise Model

The Draft EIS for Western Sydney Airport states that in estimating aircraft noise exposure, “Calculations were performed using the industry-standard INM calculation program and involved calculation of noise levels from all relevant aircraft types on all indicative flight tracks.” (Vol.4, App.E1, p.2; emphasis added). The problem is that while the Integrated Noise Model (INM) was ‘industry-standard’ for many years, it was officially replaced internationally in May 2015 and is now unequivocally *outdated*.

- Like most developed countries, Australia follows the US Federal Aviation Administration (FAA) with regards modelling of aircraft noise around airports. On 29 May 2015, the FAA replaced the INM calculation program (used in the WSA Draft EIS) with the Aviation Environmental Design Tool (AEDT) (see FAA, 2015).
- The FAA gave more than fair warning about their planned change of official model. The AEDT model was in development for more than a decade and its specifications were made available by means of reports and conferences for more than five years before final release (see Fleming, 2006; Noel et al., 2009; Roof et al., 2007).
- Indeed, an official AEDT user guide was released by the FAA in 2012 and made widely available via Amazon in 2013 (Federal Aviation Administration, 2012).
- Notably, the FAA regulation grants exemption re AEDT “*for projects whose analysis began before the effective date of this policy [viz., 29 May 2015]*” (Federal Aviation Administration, 2015) and this could be applied to the EIS for WSA.
- However, it would be unfortunate if such a US loophole were used to deprive Australians of the best available world standard noise modelling when making decisions about such a significant project as a proposed new airport in Sydney.

Recommendations re Problem Area 4: Outdated Noise Model

- 4.1** It is recommended that Australia’s decision-makers as well as the communities around the proposed Western Sydney Airport, should be presented with up-to-date and officially-endorsed aircraft noise modelling for this EIA process.
- 4.2** Accordingly, the estimations of aircraft noise exposure in the scheduled EIS Supplement (including the expanded ANEF estimations recommended in this submission) should be based on the internationally current model AEDT.

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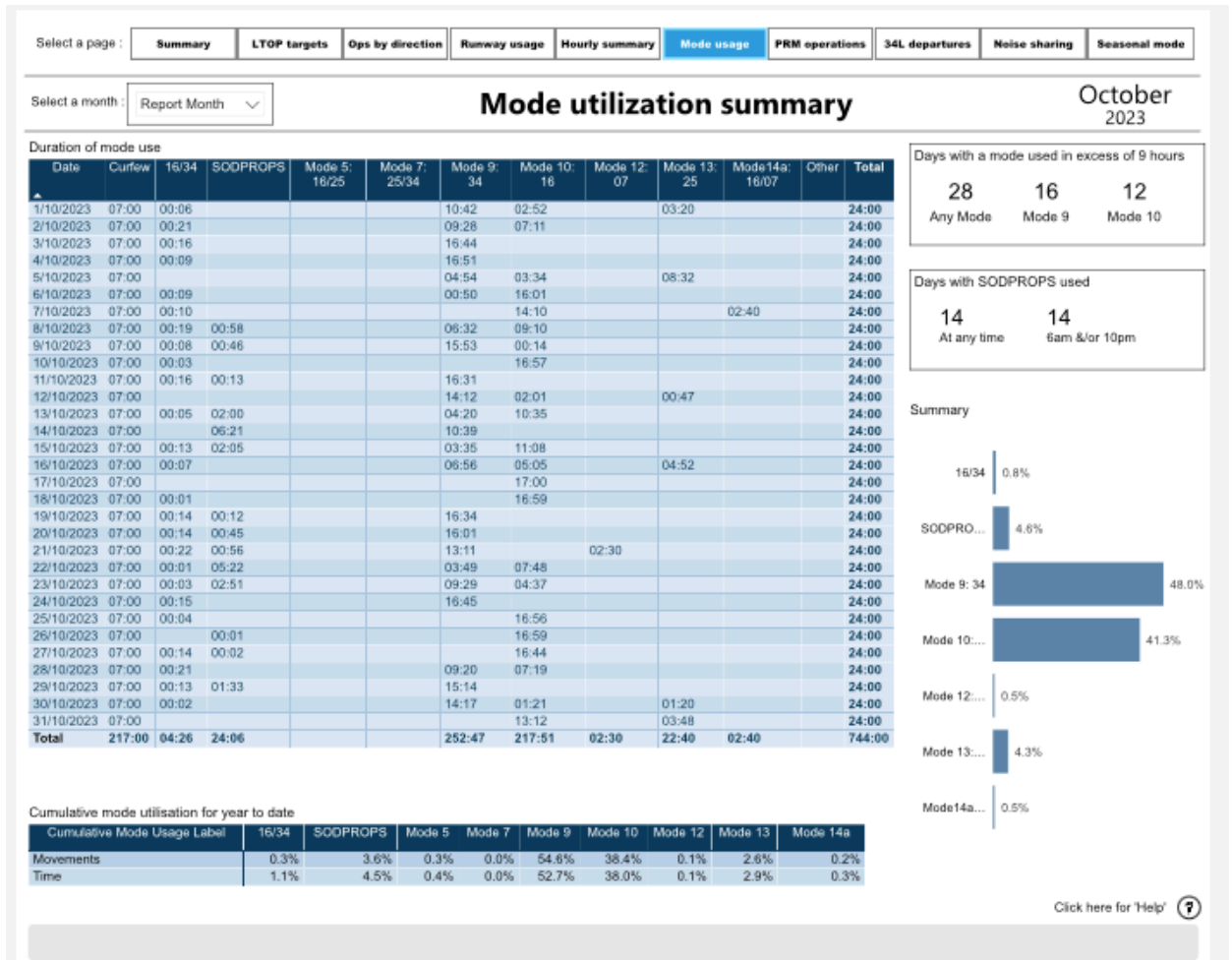
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Appendix C - Sydney Airport Mode Use, October 2023





As part of our commitment to improve our dialogue with industry and community stakeholders, Airservices Australia has developed a set of principles to help us to design, develop and make decisions about flight paths that we implement and operate.

The Draft Flight Path Design Principles have been internationally benchmarked against other aviation service providers.

Flight path design is a complex end-to-end process that must ensure safety as the first priority, and then seek to balance the efficiency and operational needs of the range of stakeholders, minimise the environmental impacts of aircraft operations, and provide equity of access to airspace. Consideration is also given to the effect of the flight path change on the broader air traffic management network performance.

It is not possible to guarantee any suburb, group or individual exemption from the effects of aircraft operations, including noise and visual impacts.

Once finalised, following national consultation, the Flight Path Design Principles will be used in the design and development of flight paths in the future, as part of the conduct of environmental assessments of proposals for new air routes and for changes to existing arrangements, and as the basis for determining the designs that will progress to implementation.

Airservices Australia commits to being transparent throughout the flight path design, development and implementation process, and to describing how each of the principles have been considered in the flight path change process.



Safety principles

- Principle 1 - The safety of air navigation must be the most important consideration.
- Principle 2 - Flight paths must be designed in accordance with Australian and International design standards established in International Civil Aviation Organisation (ICAO) PANS-OPS¹ and Australian Civil Aviation Safety Regulations Part 173.



Environmental principles

- Principle 3 - Minimise the effect on the environment through designs that effectively manage emissions, fuel consumption and greenhouse gases, limiting these wherever practicable.
- Principle 4 - To the extent practicable, protect areas of Matters of National Environmental Significance (MNES), local cultural heritage and areas of natural beauty, considering the noise, emissions and visual impacts of the change.
- Principle 5 - Design flight path changes that deliver efficiency while minimising the noise effects of aircraft operations through continuous descent operations (CDO), continuous climb operations (CCO) and unrestricted flight paths.



Noise and community impact principles

- Principle 6 - Noise should be concentrated as much as possible over non-residential and other non-noise sensitive areas and establishments.
- Principle 7 - Where residential areas are exposed to noise, it should be fairly shared whenever feasible and practicable.
- Principle 8 - Noise Abatement Procedures and Fly Neighbourly Procedures should be optimised to achieve the lowest possible overall impact on the community.
- Principle 9 - Aircraft operations that are conducted at night or on weekends should be treated as being more sensitive than those which occur during the daytime or on weekdays.
- Principle 10 - Both current and expected future noise exposure shall be taken into account when considering flight path design changes.
- Principle 11 - To the extent practicable, distribute flight paths so that residential areas overflown by aircraft arriving on a particular runway do not also experience overflight by aircraft departing from the runway in the reciprocal direction.



Operational principles

- Principle 12 - Consider the impact of flight path options on airport capacity and overall network operations.
- Principle 13 - Flight paths will accommodate differing aircraft performance as specified in ICAO PANS-OPS.
- Principle 14 - Design flight paths to facilitate access to all eligible airspace users.

¹ International Civil Aviation Publication Doc 8168-OPS/611 Volumes I and II

Disclaimer: The content in this document is in draft form. It is provided for the purposes of stakeholder engagement activities regarding the Draft Flight Path Design Principles. As it is a work in progress it may be incomplete, contain preliminary conclusions and may change. No duty of care or liability to you or any third party is accepted for any loss suffered in connection with the use of this document.

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7 July 2020

Comments on Airservices Final Flight Path Design Principles

The following is a response to the invitation for comment on the Airservices Australia's Flight Path Design Principles of June 2020. I note that these have been called "final" by Airservices. I write this as a resident of Sydney where aircraft noise pollution impacts are managed and minimised through the successful application of the best practice principles embodied in the Long Term Operating Plan for Sydney Airport and its Associated Airspace. I bring the perspective of a long and significant involvement in addressing the problems of aircraft noise on the community through membership of the Sydney Airport Community Forum and the Implementation and Monitoring Committee.

Airservices Australia's Flight Path Design Principles were an opportunity to provide a sound basis for the design of future flight paths that balanced the needs of the industry with those of the community that live under those flight paths and have to bear the cost of the aircraft noise pollution. Unfortunately, this is an opportunity that would appear to have been lost. The final Flight Path Design Principles are a significant retrograde step from the earlier January 2020 draft Flight Path Design Principles, which embodied many of the tried and tested principles of Sydney's Long Term Operating Plan, which are to minimise residential overflights and aircraft noise where possible by flying over water and non-residential areas, and then sharing unavoidable residual noise by fairly distributing it over a wide area.

The original draft Flight Path Design Principles were, for the most part, a balanced set of principles that reflected the importance of designing flight paths that minimise the effects of aircraft noise pollution, while meeting safety and satisfying operational requirements. This is not to say that there were not some areas for refinement and improvement. However, rather than refine and improve, the final Flight Path Design Principles have materially diminished those draft Flight Path Design Principles that deal with Noise and Community Impact, ensuring that they will now be largely ineffective.

Well established and key principles such as draft Principle 6, which stated: "*Noise should be concentrated as much as possible over non-residential and other non-noise sensitive areas and establishments*" have been diminished in the final Principles to say "*Consider concentrating aircraft operations to avoid defined noise sensitive sites.*" What are "defined" noise sensitive sites? Why remove the easily understood "non-residential areas" from the principle and de-emphasise that the need is to put flights away from where people live? This is a key principle that needs to be more than just considered in the design of flight paths.

The core concept in draft Principle 7 of fairly sharing aircraft noise that is unavoidable over residential areas has been narrowed in the final Principles to say that flight path designs that share noise need only be considered where “*high-density residential areas*” are impacted, rather than all residential areas. Clearly it is ridiculous to suggest that the problem of aircraft noise pollution is only confined to the high-density areas of our suburbs. And, even in this very limited application of this final Principle, the designs no longer have to follow a principle to fairly share the noise. Equity in sharing unavoidable aircraft noise over all residential areas is a core concept that needs to be at the heart of flight path design.

Similarly, the very important respite principle of non-reciprocal flight paths, which was embodied in the draft Principle 11 has disappeared entirely from the Final Principles, as has draft Principle 9 to treat night time and weekend operations as being more sensitive than those that occur during the daytime or on weekdays. These are critical principles that must be reinstated.

Particularly concerning is that all of the principles that might provide some mitigation to the problems of aircraft operations and noise, even in the compromised form of the final Principles, are now only to be “considered”, whereas principles that reflect the priorities of the industry such as to “Design flight paths that deliver operational efficiency and predictability...” are absolute and not qualified in this way. Invariably this will mean that flight paths that might avoid residential areas or fairly share noise to provide for a lower noise impact on the community, but which might be less efficient for the industry will be discounted in the design process. This is unacceptable and undermines the faith of the aircraft noise impacted community in the design process.

The above highlights just a few of the major problems with the Flight Path Design Principles of June 2020. A detailed comparison of the draft and final Principles with comments and my recommended actions to address deficiencies is at Appendix A.

Unfortunately, the June 2020 version of Airservices Australia’s Flight Path Design Principles falls way short of what is required for a balanced set of principles that reflect the importance of designing flight paths that minimise the effects of aircraft noise pollution on the community, while meeting safety and satisfying operational requirements. Disappointingly, the earlier January 2020 draft met these requirements much better, but the changes subsequently made have significantly diminished those draft Flight Path Design Principles that deal with Noise and Community Impact, ensuring that they will now be largely ineffective. While a number of the June 2020 principles are acceptable, the actions at Appendix A are necessary to reinstate the effectiveness of those principles intended to mitigate the problems of aircraft noise and restore the faith of the aircraft noise effected community in the flight path design process.

Appendices

A. Comparison, Comments and Actions on Flight Path Design Principles

Comparison, Comments and Actions on Flight Path Design Principles

Final (June 2020)	Draft (Jan 2020)	Comment
<p>Safety and Compliance Principle</p> <p>Safety of air navigation must be the most important consideration.</p>	<p>Safety Principle</p> <p>Principle 1 - The safety of air navigation must be the most important consideration.</p>	<p>No change.</p> <p>Final Principle is acceptable.</p>
<p>Safety and Compliance Principle</p> <p>Flight path design must comply with Australian and International design standards and cater for the range of aircraft that will operate on the flight paths.</p>	<p>Safety Principle</p> <p>Principle 2 - Flight paths must be designed in accordance with Australian and International design standards established in International Civil Aviation Organisation (ICAO) PANS-OPS and Australian Civil Aviation Safety Regulations Part 173.</p> <p>Operational Principle</p> <p>Principle 13 - Flight paths will accommodate differing aircraft performance as specified in ICAO PANS-OPS.</p>	<p>Final replaces Draft Principles 2 & 13.</p> <p>Final Principle is acceptable.</p>
<p>Noise and Community Principle</p> <p>Consider concentrating aircraft operations to avoid defined noise sensitive sites.</p>	<p>Noise and Community Impact Principle</p> <p>Principle 6 - Noise should be concentrated as much as possible over non-residential and other non-noise sensitive areas and establishments</p>	<p>Replaces Old Draft Principle 6</p> <p><u>Principle 6 is a key principle</u> that has been significantly diluted in the new principle with the words “consider” and “defined noise sensitive sites.” It should not just be considered. Use of “defined noise sensitive sites” de-emphasizes the main problem of noise over residential areas and risks providing equal weight to 2nd order noise sensitive areas.</p> <p>The emphasis of the principle has also been reversed from where to fly to where not to fly, which in this case diverts</p>

		<p>from the main point which is to put the noise over non-residential areas.</p> <p>Reinstate Draft Principle 6</p>
<p>Noise and Community Principle</p> <p>Consider potential impacts on social, economic and cultural values of communities and locations, including Indigenous and other heritage places.</p>	<p>Environmental Principle</p> <p>Principle 4 - To the extent practicable, protect areas of Matters of National Environmental Significance (MNES), local cultural heritage and areas of natural beauty, considering the noise, emissions and visual impacts of the change.</p>	<p>Old Draft Principle 4 is now split into two principles – this Noise and Community Principle and an Efficiency & Environment Principle.</p> <p>Final Principles is acceptable</p>
<p>Noise and Community Principle</p> <p>Where high-density residential areas are exposed to noise, consider flight path designs that distribute aircraft operations, so that noise can be shared.</p>	<p>Noise and Community Impact Principle</p> <p>Principle 7 – Where residential areas are exposed to noise, it should be fairly shared whenever feasible and practicable</p>	<p>Replaces Draft Principle 7</p> <p><u>Principle 7 is a key principle</u> that has been badly diminished in the final Principles. It should not just be considered and applied only to high-density residential areas. It is ridiculous to say that aircraft noise only impacts high density residential areas. Indeed, aircraft noise is likely of greater problem in residential suburbs with lower density and less background noise. This principle must also be enhanced by including the key lesson from the Sydney experience with specific reference that concentration in narrow flight corridors should be avoided over residential areas.</p> <p>Reinstate Draft Principle 7 but modify it to say:</p> <p><i>Where residential areas are exposed to noise, it should be fairly shared whenever feasible and practicable and concentration of aircraft within narrow flight corridor over residential areas avoided.</i></p>

<p>Noise and Community Principle</p> <p>Where noise exposure is unavoidable, consider Noise Abatement Procedures that adjust aircraft operations to reduce noise impacts, including consideration of the time of these operations.</p>	<p>Noise and Community Impact Principle</p> <p>Principle 8 - Noise Abatement Procedures and Fly Neighbourly Procedures should be optimised to achieve the lowest possible overall impact on the community.</p>	<p>Replaces Old Draft Principle 8</p> <p>Final Principle is Acceptable.</p>
<p>Noise and Community Principle</p> <p>Consider current and expected future noise exposure when designing flight paths</p>	<p>Noise and Community Impact Principle</p> <p>Principle 10 - Both current and expected future noise exposure shall be taken into account when considering flight path design changes.</p>	<p>Replaces Draft Principle 10</p> <p>Final Principle is Acceptable.</p>
	<p>Noise and Community Impact Principle</p> <p>Principle 9 – Aircraft operations that are conducted at night or on weekends should be treated as being more sensitive than those which occur during the daytime or on weekdays.</p>	<p>Draft Principle 9 has been removed.</p> <p>Recognising the additional annoyance caused by aircraft noise pollution at night in particular is a fundamental principle that needs to be included.</p> <p>Reinstate Draft Principle 9</p>
	<p>Noise and Community Impact Principle</p> <p>Principle 11 - To the extent practicable, distribute flight paths so that residential areas overflowed by aircraft arriving on a particular runway do not also experience overflight by aircraft departing from the runway in the reciprocal direction</p>	<p>Old Draft Principle 11 has been removed</p> <p>Non-reciprocal flight paths are an important respite measure.</p> <p>Reinstate Draft Principle 11</p>
<p>Efficiency and Environmental Principles</p> <p>Design flight paths that deliver operational efficiency and predictability, and minimise the effect on the environment through reducing fuel consumption and emissions.</p>	<p>Environmental Principle</p> <p>Principle 3 - Minimise the effect on the environment through designs that effectively manage emissions, fuel consumption and greenhouse gases, limiting these wherever practicable.</p>	<p>Replaces Draft Principles 3 and 5</p> <p>“Environmental Principle” has now become “Efficiency and Environmental Principle”. <u>These are not the same thing and need to be separated.</u> Things that deliver operational</p>

	<p>Environmental Principle</p> <p>Principle 5 - Design flight path changes that deliver efficiency while minimising the noise effects of aircraft operations through continuous descent operations (CDO), continuous climb operations (CCO) and unrestricted flight paths.</p>	<p>efficiency should be under the heading Operational Principles.</p> <p>Reducing fuel consumption and emissions through fewer track miles and “predictability” may result in concentration rather than avoiding communities or sharing noise thus exacerbating the noise effects.</p> <p>Reinstate Draft Principle 3 and see comments on Principle 5.</p> <p>Draft Principle 5 provides a trade-off between operational efficiency and noise effects, which should be retained as a key concept in flight path design.</p> <p>Agree to remove CDO and CCO from the draft principle. These are not universally accepted as minimising noise effects when they result in significant concentration over residential areas.</p> <p>Reinstate Draft Principle 5 but remove references to CDO and CCO and retitle as an <u>Operational Principle</u> i.e.</p> <p><i>Design flight paths that deliver efficiency while minimising the noise effects of aircraft operations</i></p>
<p>Efficiency and Environmental Principles</p> <p>Consider Matters of National Environmental Significance, other sensitive habitats, and registered heritage sites.</p>	<p>Environmental Principle</p> <p>Principle 4 - To the extent practicable, protect areas of Matters of National Environmental Significance (MNES), local cultural heritage and areas of natural beauty, considering the noise,</p>	<p>Old Draft Principle 4 is now split into two principles – this Efficiency & Environment Principle and a Noise and Community Principle.</p> <p>Final Principles is acceptable</p>

	emissions and visual impacts of the change.	
<p>Operational Principle</p> <p>Design flight paths to facilitate access to all appropriate airspace users.</p>	<p>Operational Principle</p> <p>Principle 14 – Design flight paths to facilitate access to all eligible airspace users.</p>	<p>Identical to Draft Principle 14</p> <p>Final Principle is Acceptable</p>
<p>Operational Principle</p> <p>Consider flight paths that optimise airport capacity, and meet future airport requirements.</p> <p>Operational Principle</p> <p>Consider flight paths that optimise overall network operations, including consideration of operations at adjacent airports.</p>	<p>Operational Principle</p> <p>Principle 12 - Consider the impact of flight path options on airport capacity and overall network operations.</p>	<p>Draft Principle 12 is now split into two Operational principles.</p> <p>Although there is a slight difference in emphasis there is no requirement for two principles which results in repetition.</p> <p>Delete the 2 new principles and reinstate Draft Principle 12.</p>
<p>Operational Principle</p> <p>Consider innovation and technology advancements in navigation and aircraft design</p>		<p>New principle</p> <p>Final Principle is Acceptable</p>

DRAFT

SACF SUBMISSION ON AIRSERVICES AUSTRALIA FLIGHT PATH DESIGN PRINCIPLES

Introduction

On 11 June 2020 Airservices Australia advised the Chair of the Sydney Airport Community Forum (SACF) that its final Flight Path Design Principles were available for public comment. This is a submission from SACF in response to that invitation. It is noted that while the Flight Path Design Principles do not apply to Sydney Airport and its Associated Airspace where the flight paths are determined by the principles and modes of operation of the Long Term Operating Plan (LTOP), SACF is in a unique position to offer its extensive and long standing experience and expertise in dealing with the impacts on the community of the operations from Australia's busiest airport.

Overall SACF is disappointed with the final Flight Path Design Principles. The Draft Flight Path Design Principles (January 2020), while not perfect and less effective than LTOP, were a good and reasonably balanced starting point for a set of principles that reflected the lessons learned with regards to flight paths and the impacts of aircraft noise pollution on the community. Unfortunately, what should have been a process of refinement and enhancement from a sound base has instead resulted in the principles being simplified and diluted. This is particularly the case with regards to those principles that deal with environment, noise and community impact, to the extent that resultant final Flight Path Design Principles (June 2020) are now deficient and need to be revised for those airports that do not have the benefit of LTOP.

Comparison of the Draft and Final Principles

At Appendix A is a table that compares the original draft Flight Path Design Principles with the final Flight Path Design Principles. What is immediately apparent is that aside from the two safety principles, of the remaining 11 principles, all but two of them have been qualified that they only need to be considered in the flight path design process. The two that are not qualified with "*consider*", and would therefore be viewed as absolute, are those that "*deliver operational efficiency and predictability*", and "*facilitate access to all appropriate airspace users*". In other words, principles that if properly applied might reduce noise and other community impacts are only an afterthought to be considered once the industry's priorities are satisfied. The practical effect of this might be, for example, that a potential flight path that avoids residential areas but adds track miles would be discounted because it does not deliver the same level of efficiency to the industry and results in a tiny percentage increase in the overall amount of fuel used. Flight path designs that minimise the impact of aircraft operations on the affected community should not just be considered, they must be the priority and should only be compromised if they are unsafe or are demonstrably inefficient.

As the Sydney Airport experience has taught, aircraft noise pollution impacts are managed and minimised through noise removal, relocation, reduction, respite, avoiding reciprocity and sharing unavoidable residual noise by fairly distributing it over a wide area. These lessons learnt were to a much larger extent reflected in the Draft Flight Path Design Principles than the final Flight Path Design Principles.

The final Principles have also narrowed the application of some of the key Noise and Community principles to an extent that severely limits their effectiveness. Principle 6 of the Draft Principles for example states that *“Noise should be concentrated as much as possible over non-residential and other non-noise sensitive areas and establishments”*, whereas the corresponding principle in the final Principles limits this to *“concentrating aircraft operations to avoid defined noise sensitive sites”*, without any definition of what a defined noise sensitive site is. Similarly, Principle 7 of the Draft Principles states that *“where residential areas are exposed to noise it should be fairly shared...”* However, the corresponding principle in the final Principles narrows this very considerably to only sharing noise where *“high density residential areas”* are exposed. This would seem to suggest that flight paths over most of the suburbs of our cities will not be designed to share the noise because they are not *“high density”*. Yet, as the Sydney experience has demonstrated, suburban areas with low ambient noise are at least as impacted by aircraft noise pollution as high rise, high density areas.

SACF does agree that removal of references to the current design standards and procedures such as continuous descent operations (CDO) etc. is appropriate as the document should outline principles not list design standards and operational procedures that are likely to change over time.

It should also be pointed out that it is inappropriate to have a disclaimer at the bottom of the Principles that Airservices does not represent that the information is free of errors, and we assume that this will be removed when the document is finally published.

[The Stakeholder Engagement Process](#)

SACF acknowledges that it has been kept informed of the Flight Path Design project and thanks Airservices for the presentation at its meeting on 21 February 2020. However, there are serious concerns over the stakeholder engagement process and the interpretation that Airservices and its consultants have given to the outcomes.

It is evident from the consultation methodology used, where the aircraft noise impacted community was lumped together with the general community, and where there was not even a workshop held in Sydney – the city with the busiest airport and largest aircraft noise impacted population, that this was a process that diluted the importance of the effects of aircraft noise on the community in flight path design. Eager and well-meaning members of a local Lions or sporting club who bear none of the impacts of aircraft noise pollution caused by flight paths, would appear to have been given equal consideration in the consultation as people whose day to day lives are directly affected by the aircraft operations that the flight paths impose. It is easy to minimise or dismiss all together the impacts of aircraft noise

pollution when you are not subject to it. Yet, this would seem to be the process that was used along with a survey methodology that gave the impression of being designed to provide a predetermined outcome in ascertaining relative priorities.

While there was a presentation at its February meeting to SACF on the Flight Path Design Principles there is no evidence that the feedback provided has been considered. Nor was there an opportunity for SACF members to be more fulsomely engaged through the community workshops where the Principles would appear to have been debated and tested, as there was not a community workshop held in Sydney that SACF members could attend.

While the Flight Path Design Principles do not apply to Sydney Airport and its Associated Airspace, this has deprived the broader Australian community of the long-standing experience of SACF in dealing with the implications of flight paths and aircraft noise pollution from Australia's busiest airport, and the successful implementation of the Long Term Operating Plan to share the problem of aircraft noise pollution. Unfortunately, this lack of meaningful engagement is evident in the final Flight Path Design Principles that are now inconsistent with LTOP and subsequent lessons learnt in a number of key respects.

It is concerning also that despite the current consultation process, SACF was advised by Airservices in its letter dated 11 June 2020 that *"...based on stakeholder feedback, we have developed the final principles which we will apply to the design, development and implementation of new flight path and airspace changes from July 2020."* As Airservices has given until 8 July for comments on the Principles it seems clear that they are being presented to SACF, other stakeholders and the general public as a fait accompli.

The Principles Do Not Apply to Sydney

At its last meeting Airservices confirmed to SACF that the Flight Path Design Principles it has developed do not apply to Sydney (Kingsford-Smith) Airport and its Associated Airspace due to the primacy of the Long Term Operating Plan. The Draft Summary Record for SACF Meeting 02/2020 on 8 May 2020, Agenda Item 5, records that:

"Ms Lawton (Airservices Australia) confirmed the draft Flight Path Design Principles would not apply to the operation of the Long-Term Operating Plan for Sydney (Kingsford-Smith) Airport and its Associated Airspace (LTOP), which currently governs flight paths in the Sydney Basin. Ms Lawton noted SACF members' comments that a written acknowledgement of this would be beneficial in the next version of the draft Principles."

However, the most recent version of the Flight Path Design Principles does not include the written acknowledgement that Ms Lawton refers to. The only mention of the primacy of LTOP in Sydney and its Associated Airspace is in the accompanying Application Notes dated 20 June 2020 which state on page 6:

"There may be situations where the Principles cannot be fully applied due to legislative requirements. For example, the Principles and Application Notes do not

vary the Long Term Operating Plan (LTOP) for Sydney Airport, or legislated airport curfew acts.”

The risk is that, without a clear statement, the public and airspace designers may mistakenly believe in the future that the new Principles apply everywhere, including at Sydney Airport, to the potential future detriment of LTOP, SACF and the affected Sydney community. To address this the following needs to be done:

1. The below statement is to be added (within the box outline) to the Airservices' Principles document:

“These Principles do not apply to Sydney Airport and Associated Airspace. The design and implementation of all flight paths and all operational procedures within 45 nautical miles of Sydney Airport must comply with the Long Term Operating Plan for Sydney Airport and Associated Airspace.”

2. The Application Notes page 12 should be updated to correctly reference the LTOP Legislative Instrument by adding as the 5th dot point in the paragraph headed "Policies, Legislation, Standards and Guidance"

“ Airservices Act 1995- section 16(1) - Direction concerning the Sydney Airport long term operating plan - Legislative Instrument F2009B00158” .
(Commonly referred to as the 1997 Ministerial Direction, Instrument M94/97, The Long-Term Operating Plan for Sydney (Kingsford Smith) Airport and Associated Airspace.)

3. The Application Notes page 12 also need to be updated to correctly reference LTOP and its Proponents Statement as a source of information by including under Sources of Information:

“The Long-Term Operating Plan for Sydney (Kingsford Smith) Airport and Associated Airspace - Airservices Australia Taskforce Report, December 1996.

Sydney Airport Long Term Operating Plan - Proponent's Statement - Department of Transport and Regional Development, June 1997” .

Both complete documents should also be made available for download from the Airservices Australia web site.

Copies of the relevant pages from the above documents with these amendments made are at the Appendixes.

It should also be noted that if it eventuates that application of the Principles to other flight paths directly or indirectly impact upon LTOP, Sydney Airport or its Associated Airspace, the 1997 Ministerial Direction requires that SACF must be consulted before any change is implemented.

Conclusion

The final Flight Path Design Principles provide little confidence that future flight paths across Australia will be designed in a manner that minimises the impact of aircraft operations on aircraft noise affected communities. They show a clear preference towards satisfying airport and industry objectives while only considering aspects of flight path design that provide community benefit after other priorities have been met. While the primacy of LTOP fortunately means these principles will not be applied to Sydney Airport and its Associated Airspace there is a need for this to be explicitly recognised in the Flight Path Design Principles and for reference to the Ministerial Direction and LTOP documentation in the Application Notes that accompany the Principles.

SACF is disappointed that its long-standing expertise was not better utilised by Airservices and its consultants in development of the Principles and that this is evident in the result. It is clear that the current version of the Principles should not be considered final and their implementation should be delayed until the current deficiencies are rectified. SACF members would be willing to assist in this.

Appendices:

- A. Comparison of Draft Flight Path Design Principles and Final Flight Path Design Principles
- B. Proposed addendum to the Flight Path Design Principles to include that the Principles do not apply to Sydney Airport.
- C. Proposed addendum to the Application Notes, p12 to reference the LTOP Ministerial Direction and associated LTOP documentation.

Comparison of Airservices Version 1 and Version 2 Draft Flight Path Design Principles

Version 1 (March 2020)	Version 2 (June 2020)	Comment
<p>Safety Principle</p> <p>Principle 1 - The safety of air navigation must be the most important consideration.</p>	<p>Safety and Compliance Principle</p> <p>Safety of air navigation must be the most important consideration.</p>	<p>Unchanged – same as Old Draft Principle 1</p> <p>Note change of category title</p>
<p>Safety Principle</p> <p>Principle 2 - Flight paths must be designed in accordance with Australian and International design standards established in International Civil Aviation Organisation (ICAO) PANS-OPS and Australian Civil Aviation Safety Regulations Part 173.</p>	<p>Safety and Compliance Principle</p> <p>Flight path design must comply with Australian and International design standards and cater for the range of aircraft that will operate on the flight paths.</p>	<p>Replaces Old Draft Principles 2 and 13</p>
<p>Environmental Principle</p> <p>Principle 3 - Minimise the effect on the environment through designs that effectively manage emissions, fuel consumption and greenhouse gases, limiting these wherever practicable.</p>	<p>Efficiency and Environmental Principles</p> <p>Design flight paths that deliver operational efficiency and predictability, and minimise the effect on the environment through reducing fuel consumption and emissions.</p>	<p>Replaces Old Draft Principles 3 and 5</p> <p>Note change of category title “Environmental Principle” has now become a combined “Efficiency and Environmental Principle”</p>
<p>Environmental Principle</p> <p>Principle 4 - To the extent practicable, protect areas of Matters of National Environmental Significance (MNES), local cultural heritage and areas of natural beauty, considering the noise, emissions and visual impacts of the change.</p>	<p>Noise and Community Principle</p> <p>Consider potential impacts on social, economic and cultural values of communities and locations, including Indigenous and other heritage places.</p>	<p>Old Draft Principle 4 now split into two principles</p> <p>Note use of word “consider” in 7 Principles and consequent softening.</p>

	<p>Efficiency and Environmental Principles</p> <p>Consider Matters of National Environmental Significance, other sensitive habitats, and registered heritage sites.</p>	
<p>Environmental Principle</p> <p>Principle 5 - Design flight path changes that deliver efficiency while minimising the noise effects of aircraft operations through continuous descent operations (CDO), continuous climb operations (CCO) and unrestricted flight paths.</p>	<p>Efficiency and Environmental Principles</p> <p>Design flight paths that deliver operational efficiency and predictability, and minimise the effect on the environment through reducing fuel consumption and emissions. See also two above.</p>	<p>Replaces Old Draft Principles 3 and 5</p> <p>Operational efficiency now more prominent. Reduced fuel consumption and emissions may imply fewer track miles which may imply unwanted concentration of flights and noise.</p>
<p>Noise and Community Impact Principle</p> <p>Principle 6 - Noise should be concentrated as much as possible over non-residential and other non-noise sensitive areas and establishments</p>	<p>Noise and Community Principle</p> <p>Consider concentrating aircraft operations to avoid defined noise sensitive sites.</p>	<p>Replaces Old Draft Principle 6</p> <p>Consideration of concentration now potentially broadened.</p>
<p>Noise and Community Impact Principle</p> <p>Principle 7 – Where residential areas are exposed to noise, it should be fairly shared whenever feasible and practicable</p>	<p>Noise and Community Principle</p> <p>Where high-density residential areas are exposed to noise, consider flight path designs that distribute aircraft operations, so that noise can be shared.</p>	<p>Replaces Old Draft Principle 7</p> <p>Now referring to High Density areas only.</p>

<p>Noise and Community Impact Principle</p> <p>Principle 8 - Noise Abatement Procedures and Fly Neighbourly Procedures should be optimised to achieve the lowest possible overall impact on the community.</p>	<p>Noise and Community Principle</p> <p>Where noise exposure is unavoidable, consider Noise Abatement Procedures that adjust aircraft operations to reduce noise impacts, including consideration of the time of these operations.</p>	<p>Replaces Old Draft Principle 8</p>
<p>Noise and Community Impact Principle</p> <p>Principle 9 - Aircraft operations that are conducted at night or on weekends should be treated as being more sensitive than those which occur during the daytime or on weekdays.</p>		<p>Old Draft Principle 9 removed</p>
<p>Noise and Community Impact Principle</p> <p>Principle 10 - Both current and expected future noise exposure shall be taken into account when considering flight path design changes.</p>	<p>Noise and Community Principle</p> <p>Consider current and expected future noise exposure when designing flight paths</p>	<p>Replaces Old Draft Principle 10</p> <p>Largely unchanged.</p>
<p>Noise and Community Impact Principle</p> <p>Principle 11 - To the extent practicable, distribute flight paths so that residential areas overflowed by aircraft arriving on a particular runway do not also experience overflight by aircraft departing from the runway in the reciprocal direction</p>		<p>Old Draft Principle 11 removed</p> <p>Non-reciprocal flight paths is an important respite measure and is now gone.</p>
<p>Operational Principle</p> <p>Principle 12 - Consider the impact of flight path options on airport capacity and overall network operations.</p>	<p>Operational Principle</p> <p>Consider flight paths that optimise airport capacity, and meet future airport requirements.</p> <p>Operational Principle</p>	<p>Replaces Old Draft Principle 12</p> <p>Optimising airport and network capacity now more prominent.</p>

	Consider flight paths that optimise overall network operations, including consideration of operations at adjacent airports.	Replaces Old Draft Principle 12
Operational Principle Principle 13 - Flight paths will accommodate differing aircraft performance as specified in ICAO PANS-OPS.		Replaced by Safety and Compliance Principle (second dot point)
Operational Principle Principle 14 – Design flight paths to facilitate access to all eligible airspace users.	Operational Principle Design flight paths to facilitate access to all appropriate airspace users.	Replaces Old Draft Principle 14
	Operational Principle Consider innovation and technology advancements in navigation and aircraft design	New

Flight Path Design Principles




Safety and compliance principles

- Safety of air navigation must be the most important consideration.
- Flight path design must comply with Australian and international design standards, and cater for the range of aircraft that will operate on the flight paths.



Noise and Community principles

- Consider concentrating aircraft operations to avoid defined noise sensitive sites.
- Consider potential impacts on social, economic and cultural values of communities and locations, including Indigenous and other heritage places.
- Where high-density residential areas are exposed to noise, consider flight path designs that distribute aircraft operations, so that noise can be shared.
- Where noise exposure is unavoidable, consider Noise Abatement Procedures that adjust aircraft operations to reduce noise impacts, including consideration of the time of these operations.
- Consider current and expected future noise exposure when designing flight paths.



Efficiency and Environmental principles

- Design flight paths that deliver operational efficiency and predictability, and minimise the effect on the environment through reducing fuel consumption and emissions.
- Consider Matters of National Environmental Significance, other sensitive habitats, and registered heritage sites.



Operational principles

- Design flight paths to facilitate access to all appropriate airspace users.
- Consider flight paths that optimise airport capacity and meet future airport requirements.
- Consider flight paths that optimise overall network operations, including consideration of operations at adjacent airports.
- Consider innovation and technology advancements in navigation and aircraft design.

These Principles do not apply to Sydney Airport and Associated Airspace. The design and implementation of all flight paths and all operational procedures within 45 nautical miles of Sydney Airport must comply with the Long Term Operating Plan for Sydney Airport and Associated Airspace.

Disclaimer: While the information contained in this document has been prepared with all due care, airservices does not represent that the information is free from errors or omissions.

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Policies, Legislation, Standards and Guidance

- *Air Services Act 1995*
- *Airports (Protection of Airspace) Regulation 1996*
- *CASA Manual of Standards Part 173 – Standards Applicable to Instrument Flight Procedures Design (2016)*
- *Civil Aviation Safety Regulations (CASR) 1998 Part 173 – Instrument flight procedure design*
- *ICAO Doc 8168 Procedures for Air Navigation Services – Aircraft Operations (PANS-OPS)*
- *ICAO Doc 9905 Required Navigation Performance Authorization Required (RNP AR) Procedure Design Manual*

Sources of Information

Our Aeronautical Information Service (AIS) provides the online material and publications that display flight paths, instrument flight procedures and aerodrome charts

<https://www.airservicesaustralia.com/ain/aip.asp>

Exclusions

There are many other parties with a range of responsibilities for managing aviation safety within Australia, including CASA, Australian Transport Safety Bureau (ATSB), airlines and operators, pilots, airports, and aircraft manufacturers.

These parties are also responsible for elements of aviation safety, outside of Airservices obligations to the safety of aviation navigation.

Federally leased airports must manage prescribed airspace approved by Department of Infrastructure, Transport, Regional Development and Communications (DITRDC) and this cannot be infringed upon. The prescribed airspace establishes protection from obstacles at and around airports in the interests of the safety, efficiency or regularity of existing or future air transport operations.

Airports are also responsible for other hazard management including animals and bird-life.

Airservices Act 1995- section 16(1) - Direction concerning the Sydney Airport long term operating plan - Legislative Instrument F2009B00158

Words within the red box above to be added as the 5th dot point in the paragraph headed "Policies, Legislation, Standards and Guidance".

The Long-Term Operating Plan for Sydney (Kingsford Smith) Airport and Associated Airspace - Airservices Australia Taskforce Report December 1996
Sydney Airport Long Term Operating Plan - Proponent's Statement - Department of Transport and Regional Development June 1997

Words within the red box above to be added to the end of the paragraph headed "Sources of Information".

Sydney Airport Preferred Runway Selection

Effective from 1 July 2010 (LOA 3181 V1)

Monday to Friday		
2300 to 0600	1.	Curfew – Departures 16R / Arrivals 34L (Mode 1)
0600 to 0700	1.	SODPROPS - Departures 16L / Arrivals 34L
	2.	Departures 16L&R / Arrivals 34L (Shoulder Curfew). If traffic permits.
	3.	Departures 34R, 25 & 34L / Arrivals 34L&R (Mode 8), or Departures 25 / Arrivals 34L&R (Mode 7), or Departures 16L&R / Arrivals 25 (Mode 5), or Departures 16L&R / Arrivals 07 (Mode 14A)
	4.	34 (Mode 9) or 16 (Mode 10)
	5.	07 (Mode 12) or 25 (Mode 13)
0700 to 2245	1.	SODPROPS - Departures 16L / Arrivals 34L
	2.	Departures 16L&R / Arrivals 07 (Mode 14A), or Departures 34R, 25 & 34L / Arrivals 34L&R (Mode 8), or Departures 25 / Arrivals 34L&R (Mode 7), or Departures 16L&R / Arrivals 25 (Mode 5)
	3.	34 (Mode 9) or 16 (Mode 10)
	4.	07 (Mode 12) or 25 (Mode 13)
2245 to 2300	1.	SODPROPS - Departures 16L (Mandatory) / Arrivals 34L
	2.	Departures 16L&R (Mandatory) / Arrivals 34L (Shoulder Curfew) unless there would be significant delays to either departing or arriving aircraft or traffic complexity requires a variation or weather conditions preclude the use of 34L.
	3.	Departures 16L&R / Arrivals 25 (Mode 5), or Departures 16L&R / Arrivals 07 (Mode 14A)
	4.	16 (Mode 10)

Saturday and Sunday		
2300 to 0600	1.	Curfew – Departures 16R / Arrivals 34L (Mode 1)
0600 to 0700 Saturday	1.	SODPROPS - Departures 16L / Arrivals 34L
0600 To 0800 Sunday	2.	Departures 16L&R / Arrivals 34L (Shoulder Curfew). If traffic permits.
	3.	Departures 16L&R / Arrivals 25 (Mode 5), or Departures 16L&R / Arrivals 07 (Mode 14A), or Departures 34R, 25 & 34L / Arrivals 34L&R (Mode 8), or Departures 25 / Arrivals 34L&R (Mode 7)
	4.	34 (Mode 9) or 16 (Mode 10)
	5.	07 (Mode 12) or 25 (Mode 13)
0700 to 2200 Saturday	1.	SODPROPS - Departures 16L / Arrivals 34L
0800 To 2200 Sunday	2.	Departures 16L&R / Arrivals 07 (Mode 14A), or Departures 34R, 25 & 34L / Arrivals 34L&R (Mode 8), or Departures 25 / Arrivals 34L&R (Mode 7), or Departures 16L&R / Arrivals 25 (Mode 5)
	3.	34 (Mode 9) or 16 (Mode 10)
	4.	07 (Mode 12) or 25 (Mode 13)
2200 to 2245	1.	SODPROPS - Departures 16L (Mandatory) / Arrivals 34L
	2.	Departures 16L&R (Mandatory) / Arrivals 34L (Shoulder Curfew) unless there would be significant delays to either departing or arriving aircraft or traffic complexity requires a variation or weather conditions are not suitable.
	3.	Departures 16L&R / Arrivals 25 (Mode 5)
	4.	Departures 16L&R / Arrivals 07 (Mode 14A)
	5.	Departures 34R, 25 & 34L / Arrivals 34L&R (Mode 8)
	6.	Departures 25 / Arrivals 34L&R (Mode 7)
	7.	34 (Mode 9) or 16 (Mode 10)
	8.	07 (Mode 12) or 25 (Mode 13)
2245 to 2300	1.	SODPROPS - Departures 16L (Mandatory) / Arrivals 34L
	2.	Departures 16L&R (Mandatory) / Arrivals 34L (Shoulder Curfew) unless there would be significant delays to either departing or arriving aircraft or traffic complexity requires a variation or weather conditions preclude the use of 34L.
	3.	Departures 16L&R / Arrivals 25 (Mode 5), or Departures 16L&R / Arrivals 07 (Mode 14A)
	4.	16 (Mode 10)

Rwy 34 and Rwy 16 Parallel Runway operations should only be considered for use if required for traffic management purposes during the following hours:
 0700 to 1100 Monday to Saturday
 0800 to 1100 Sunday
 1500 to 2000 Sunday to Friday
 In order to take advantage of suitable traffic dispositions, variations to these times will occur.
 20 knot crosswind and 5 knot downwind criteria apply to all dry runway conditions
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