D R A F T

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[redacted]

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Submission to:
Review of Sydney Airport Demand Management

On 5 November 2020, the Department of Infrastructure, Transport, Regional Development and Communications issued an invitation to the public to convey their views on how the demand management at Sydney Airport is working now and on the issues raised in their linked November 2020 discussion paper ("Discussion Paper"). I am gratefully taking up this opportunity. [redacted]

In the following I shall first address the Discussion Paper and then make a comment about how the demand management at Sydney Airport is working now.

Response to the Discussion Paper

The Discussion Paper seems to reflect the structure of the management of the legislative and regulatory framework pertaining to Sydney Airport since 1997 (Figure on p 5 and Figure on p 6, Discussion Paper).

The timing of the review of Sydney Airport Demand Management ("Review") is triggered by a sunset clause in the *Legislation Act 2003,* according to which the legislative instruments in relation to Sydney Airport will cease to have effect on 1 April 2024 unless this legislation is reviewed and remade. The purpose of this legislation is to reduce 'red tape'. (Discussion Paper, p 7).

The scope of the Review excludes:

1. The number of aircraft movements permitted each hour at Sydney Airport (Movement Cap).
2. The Long Term Operating Plan ("LTOP") and Sydney Airport Curfew Act 1995.
3. Matters relating to the development and operation of Western Sydney International (Nancy-Bird Walton) Airport ("WS Airport").
4. Noise sharing arrangements.
   (Discussion Paper, p 5)

Policies underpinning the Legislation. The Discussion paper states: *"The policies underpinning the Legislation were originally designed to balance productivity with a range of social, competition and other objectives. In doing so, demand management has, to date, embodied a series of competing objectives, including:*

1. *maximising the number of flights within the movement cap;*
2. *managing noise impacts on the local community;*
3. *maximising passengers and freight;*
4. *guaranteeing access to flights from regional areas;*
5. *providing certainty of slots for incumbent airlines; and*
6. *encouraging competition through making slots available for new entrants"* (Numbers have been substituted for the dot points in the original for ease of reference.)

I'd like to add a little bit of detail as to the history underpinning the Legislation.

The LTOP was the Federal Government's response to the public outcry following the commissioning of the Third Runway in late 1994, which involved a parallel runway operation, (see *Falling on Deaf Ears*, 1995). Specifically, the 1996 Long Term Operating Plan for Sydney (Kingsford Smith) Airport and Associated Airspace, Airservices Australia contains the following statements:

> *"Ín March 1996, the newly elected Federal Coalition Government, in line with the stated policy 'Putting People First', directed Airservices Australia to review current operating procedures and associated airspace and develop a Long Term Operating Plan for Sydney (Kingsford Smith) Airport.* (Emphasis - underlining - is added)
>
> *"Federal Transport and Regional Development Minister, John Sharp's direction gave Airservices Australia the ability to not only implement government policy but address a growing impasse which had been created from trying to balance continued high growth in air transport with the environmental impact caused by this growth on the Sydney community."*
>
> *"During development of the plan and during the course of public consultation many issues including the suggestion that the Airport be closed or building a new airport out in the Tasman Sea or issues concerning the site selection and construction of a second Sydney airport, were made which were either outside the Terms of Reference or not within Airserices Australia's area of expertise or responsibilities."*

The Sydney Airport Community Forum was created to provide community input into the review and planning process.

To Airservices' credit, they developed a suit of operating modes to assist in noise sharing. The East-West runway was reopened and respite periods were introduced. The difficulties in managing the 'planning disaster' of the capacity expansion of Sydney Airport by means of the Third Runway is aptly described in the 2005 report by AIRWAYS INTERNATIONAL**,** "Sydney Airport Community Forum Long Term Operating Plan, Review of LTOP Performance". As indicated in the Discussion Paper, a capacity usage constraint was introduced by legislation (movement cap, curfew act, noise sharing, slot management, regional access). The relationship between unconstrained (parallel runway operation) and constraint capacity utilisation is also discussed in the AIRWAYS INTERNATIONAL 2005 report.

I am using the term 'planning disaster' for lack of a better expression to refer to the misapplication of the AS2021-85, Acoustics – Aircraft Noise Intrusion – Building Siting and Construction. This standard is based on the Australian Noise Exposure Forecast system (ANEF), which the Civil Aviation Authority deemed 'definitive' in 1988. The ANEF is based on the Integrated Noise Model, which uses 'equal energy units' as the common denominator for aggregating over the number of aircraft of various types, performing various types of operations. This model was calibrated, using Australian data in the early 1980s (Hede and Bullen, published in the National Acoustics Laboratories Report No 88).

On the recommendation of the Civil Aviation Authority, the following 'land use compatibility' criteria has been established. "*Sites for the construction of new residences are classified as 'Acceptable' outside the 20 ANEF noise contour, 'Conditional' (subject to mitigation of internal noise) within the 20-25 ANEF noise contour and 'Unacceptable' in areas exposed to noise levels greater than 25 ANEF."* (Mitchell McCotter, 1994, p.3.5).

The proponent of the Third Runway project, the FAC, applied the AS2021-85 standard in the 1990 Draft EIS to assess the noise impact of the project by plotting contour levels and declared that the term *"noise affected area is quite specifically defined as that area within the 20 ANEF contour, because at this exposure and above, aircraft noise has land-use implications as defined in AS2021-85" (*EIS, 1991 Sup. Vol I). On the basis of this methodology, the Third Runway was considered to provide a social benefit by significantly reducing the number of 'seriously affected' people (due to the closure of the East-West runway), ruling out the alternatives, namely two proposed airports at Badgery's Creek.

The obvious problem with this methodology is that the word "new" has been edited out in the land use compatibility advice of the AS2021-85. To retrospectively impose a land use advice criteria onto existing residential areas is a categorical error. But this is not the only problem. Another categorical error is that the EIS documents did not contain the flight path maps that were published in the 1994 Draft Noise Management Plan by Mitchell McCotter, after the Third Runway had been constructed. In both cases the category error involves the

sequence of decision making in calendar time. But there are more methodological problems.

Ku-ring-gai Council's complaint that insufficient information has been provided in relation to Ku-ring-gai on which a detailed submission can be made. The FAC responded *"No part of the Ku-ring-gai municipality is forecast to fall within the 20 ANEF contour for the long-term scenario. Accordingly, it was not considered appropriate to undertake detailed studies of the noise effect in the Ku-ring-gai municipality. The distance from the airport also indicates that it was not appropriate to undertake a detailed study of the effects of the proposal or other matters such as road traffic."* (EIS, 1991, Sup. Vol I, 22.2.4). This error in the public consultation process was countered by the establishment of the Sydney Airport Community Forum – although it could only assist in mitigation of the problem rather than preventing it.

There are more granular methodological problems. In the NAL 1982 study, on which the AS2021-85 is based, there were no noise measurements taken north of Drummoyne and no community reactions elicited, the sample size of subjects for the area examined in Sydney is small, the Integrated Noise Model assumes aircraft movements take place over a flat plane and arriving aircraft follow a 3 degree constant descent slope and there is no variation in sound emission due to pilot operations. But the land north of the ANEF contour level 20 is not flat but rises, relative to the location of Sydney Airport, and not all aircraft descent at a constant 3 degree slope but cruise, which adds dBs. Moreover, this methodology does not lend itself to be integrated into an economic analysis (Gross, 1994).

To the best of my knowledge, the study by Gross and Sim (1997) is still the only empirical study of the impact of aircraft noise on residents outside the 20 ANEF contour. It uses the same questionnaire as that used in the NAL 1982 study. In the absence of equal energy unit aircraft noise data, flight tracking maps were used to form 'flight density categories'. Further details on the sample and the flight density categories and the results are contained in the enclosed copy of the paper. The point to note here is that the number of 'seriously affected residents' in the LGA of Ku-ring-gai is greater than in the area close to the airport. This is a clear rejection of the FAC's assumptions as stated above. Moreover, the study found that the percentage of 'seriously affected residents' is highest in the highest flight density category, indicating that the number of flights matters, and there is no evidence that the responses reflect a negative attitude toward the aviation industry. The LGA of Ku-ring-gai is only a subset of the total residential areas exposed to aircraft noise outside the ANEF 20 contour. There is Lane Cove, Ryde, Hornsby on the North alone.

Airservices Australia developed alternative noise exposure measures. For example N70, which gives the number of flights during a specified time period where the maximum sound emission, Lmax, is equal to or exceeds 70dB (or dBA, I can't remember). The importance of

single fly over events is reflected on the applied level. For illustrative purposes, I refer to "Measuring Noise", NATS.

While an equal energy measure of noise exposure may be a preferred measure in some situations, it is not 'definitive' in the sense that it is applicable under all empirical conditions.

Productivity.

The conclusions of the PC report, which seems to underlie this Review, does not explicitly define 'productivity'. Implicitly, the term productivity refers to capacity utilisation of the physical airport asset, Sydney Airport ("KSA"). This is also reflected in the specific questions regarding the demand management for KSA, from which this type of productivity improvements may arise, namely a change in the regulation of hourly aircraft movement cap, slot management and Regional Access. Lets call it 'KSA productivity'.

The monetary beneficiaries of KSA productivity and KSA productivity improvements are the shareholders of Sydney Airport (including superannuation funds); senior management, particularly if bonuses are conditioned on profits; employees, assuming there are no alternative employment prospects; airlines (not necessarily all equally). Lets call it 'the aviation industry'. The monetary benefits, other than those of employees, are reflected in the balance sheets of the aviation industry corporations and in share prices. Lets call this the commercial benefits, which depend on 'market conditions' and the 'market conditions' in turn influence physical capital utilisation, given a set of regulations. I ignore here the observation that the profit of Sydney Airport is highly sensitive to parking fees.

The effect of a reduction in the capacity utilisation of airports due to the corona virus pandemic on the aviation industry is reflected in the balance sheets of the corporations in question.

Setting aside for the moment the corona virus pandemic, the 'KSA productivity' notion is seriously flawed for several reasons:

1. Change in airport infrastructure: "*The development and operation of Western Sydney International Airport and other airports in the Sydney basin are also outside the scope of this review."* I understand this to mean that the Federal Government's announcement that Western Sydney airport will be operational in 2026 is to be taken as a given. (About 2 years after the sunset clause, which triggered the current review.)

   The KSA productivity does not take the change in airport infrastructure into account.

   The privately owned airport asset KSA must not be given preferential treatment over the publicly owned airport asset Western Sydney Airport by locking in the 'productivity of KSA' after April 2024 via the demand management scheme. To do otherwise would be planning for inefficient use of airport infrastructure (partial answer to objective 1, p 6

Discussion Paper) and it would be planning for reducing 'competition' within the industry; it would entail a subsidy for KSA, and reduce the future monetary value of Western Sydney Airport in case of privatisation (partial answer to objective 2, p 6 Discussion paper). I am not sure what "resilience within the industry" means. However, having Western Sydney Airport operational would provide resilience to the aviation industry in cases of extreme weather events or other unpredictable or difficult to schedule events. Moreover it would allow more and more effective noise sharing to move closer to the promises made to the public at the time the capacity of Sydney Airport was expanded by means of the Third Runway.

2. Negative externalities: In economics, a negative externality refers to a by-product of a production (or consumption) activity which is unwanted or harmful to a third party or to human life in general. Since human life depends on the ecosystem, there is no intrinsic conflict between ecology and economics.

   There is no conflict between economics and the expression 'people first'. Roughly speaking, the notion 'people first' corresponds to the notion of Pareto efficiency, which depends on people's preferences and their wealth (which must not be 'too concentrated' otherwise 'freedom of choice makes no sense). The objective of corporations ('producers') is subordinate to what people want.

   There is a conflict between the economic and commercial perspectives in so far as commercial value is a monetary value which is calculated on the basis of invoices, issued or received, which record the inner product of quantities of transacted goods and services and their prices. But there are no invoices for negative externalities because there are no negative prices. The market is said to be 'incomplete'. Hence, whenever there are externalities, the economic value either exceeds or is less than the commercial (accounting or financial) value.

   Since the Sydney Airport Corporation is a commercial organisation, it is not surprising that it wishes to maximise capacity utilisation to maximise profits. (The FAC was created with the explicit objective to pursue commercial interests and it was even given a rate of return target.)

   In economics the problem of externalities has been recognised for about 100 years (Pigou, UK), not long thereafter in a general equilibrium context (Lindahl, Sweden) and Blad and Keiding 1990. Blad and Keiding (Sydney and Denmark) represent a positive externality as an enlargement of a consumption possibility set and a negative externality as a reduction in this set. Using the Blad and Keiding concepts, an example of an aircraft flyover creating a positive externality is the plausible case where an adult is unable to calm a screaming toddler. The adult point to the sky and says look there is an aeroplane. The toddler stops screaming . A negative externality would be something which a person wants to do but cannot due to a by-product of aviation activities.

The catch phrase in contemporary economic research is: Internalisation of externalities. That is, methods are developed to impute a monetary value to the negative externality which is to be subtracted from the commercial value.

Airport infrastructure. Without aircraft flying in and out of an airport, the commercial value of an airport is zero and the economic value is negative because a valuable resource, land, would be occupied and therefore not available for alternative use.

Negative externalities from an operating airport:

1. Aircraft noise pollution: Sound emissions of aircraft (mechanical and aerodynamic – cabin noise excluded) over populated geographic areas, which have unwanted consequences for the people on the ground. Aircraft noise is typically a local issue. These consequences range from annoyance, interference with speech, various activity disturbances, loss of sleep, reduced efficiency of memory to serious health effects such as hearing impairment, hypertension and heart decease (see for example Clark, 2015)
2. Air pollution has been found to be both a local (take-off and landing) and global (high altitude flights) problem. Micro-particles emitted (eg sulfur dioxide and nitrogen oxide) have negative health effects (cardiovascular and lungs). I am not sufficiently familiar with this growing body of literature to provide a reference. But I believe it should be investigated.
3. ghg emissions: global. CO2 emissions and anthropogenic global warming. Aviation industry emits at least 2% of global CO2 and there are other ghg emissions. (see for example Ritchie, 22 October 2020.)
4. Water pollution due airport operations (eg runoffs) and discharge of fuel due to emergency landings.
5. Soil and ground water pollution
6. Crash over populated areas (it does happen; an extreme case of a negative health effect and property damage)
7. Road congestion; local (eg KSA) airport related road transport adds to congestion. The more 'productive' the airport the bigger the congestion problem is likely to be.

Each of these externality categories entails specialist knowledge and more often than not requires an interdisciplinary approach, particularly at the stage of developing methods to 'internalise' negative externalities such that the commercial value can be adjusted to reflect the economic value. Hence I limit my submission to item 1.

I have applied the Blad and Keiding notion of externalities to develop a method of 'internalising transport noise'. The special feature of this method is that the cost of transport noise can be measured in physical units and in monetary value terms. The physical cost is measured in terms of the duration of activity disturbance with the unit of measurement being a unit of time. A monetary value can be assigned using socially

acceptable criteria, other than zero. By socially acceptable criteria I mean it is not up to me as an economist to decide whether or not one hour of loss of sleep should be valued at 'market value' (which would be a hypothetical foregone income) or equally such that the loss of sleep of a person on $40000 income p.a. is valued equally to the loss of sleep of a person on $4 million income p.a. Medical and other health experts may be able to provide useful input, too. The idea developed from an aside in Gross 1994, is described primarily in words in Gross 1996 and is formalised in Gross 2004 (copy enclosed). The latter also contains a review of other approaches of valuing externalities.

A pilot study of the idea of measuring the real resource costs of aircraft noise in terms of the duration of activity disturbances was carried out in 1995 in the LGA of Ku-ring-gai. The method, its relationship to then existing information regarding possible categories of activity disturbances and the test results are in Gross and Sim 1998 (copy enclosed). The points to note here are, firstly, the real resource costs of activity disturbance, measured in units of time, increase with aircraft noise exposure as represented by flight density categories. As a rough estimate of annualised costs, two alternative hourly imputed monetary values were considered, $6.92 for private car use in travel time saved studies and the average weekly earnings. The resulting rage of annual costs at the time is between $3,863,913 and $12,379,039.

To illustrate the difference between the economic and the commercial value, these external cost of aircraft noise estimates constitute between 5.6% and 18.1% of the after tax profit of the Federal Airport Corporation for the financial year ending June 1995, on the basis of the 1016 residents alone, who responded. These residents live in an area that was classified as 'not aircraft noise affected' in the EIS for the Third Runway.

3. The KSA productivity notion fails to acknowledge that the Long Term Operating Plan did not 'solve' the aircraft noise problem created by the expansion of KSA by means of the Third Runway and the associated parallel runway operation in the Draft Management plan. It merely is the best mitigation approach that could be designed after the event.

   Time does not erase this history nor did it erase the problem. On the contrary, the growth in aircraft movement and the introduction of 'quiet' huge planes increased the problem. Surely, relying on pandemics to provide prolonged periods of 'respite' is not a long term solution.

Specific questions

A. Definition of regulated hour. How would changes in the definition of a regulated hour (ie removing the rolling hour) impact stakeholders.

Response: Don't change, because:

- Maximising the number of flights within the movement cap of 80 per hour is not the overarching policy objective from the perspective of residents that had been promised

to be not 'aircraft noise affected' (there are several hundred thousands of such residents)

- Reducing compliance costs are avoidable not by the residents on the ground but by the aviation industry.
- Benefits for passengers on departure need to be related to costs of aircraft noise affected residents on the ground. Where is the data?
- "It is anticipated significant condensing of flights and related noise at any particular part of an hour to be highly unlikely." This is not credible. Any improvement in KSA productivity implies a deterioration for aircraft noise affected people residents because any reduction in noise sharing entails external costs.

B. Should any flights be excluded from the movement cap, while still providing a net benefit to the community? What impact would that have?

2.1 Recovery from interruptions. "Sydney Airport cited two such events (of adverse weather) that occurred in September 2017 which "collectively resulted in around 230 flight cancellations, the delay of many other flights and disruptions to the travel plan of tens of thousands of airline passengers nationwide."

This is not an argument for relaxing the cap of 80 aircraft movements per hour. It is an argument in favour of the corporate management recognising that a certain slack in the system is required to deal with unforeseen circumstances (risk management) and it is an argument in favour of having Western Sydney airport.

Tens of thousands of airline passengers nationwide were inconvenienced. This is regrettable on an individual level. Perhaps these passengers should be told that the cancellation of the 230 flights has provided a temporary aircraft noise respite for hundreds of thousands of residents in Sydney alone.

2.2 Excluded movements:

NO

- Movements which occur without a slot allocation involve an emergency… "However, these flights continue to count towards the movement cap"

Well yes, they count because they happen. Unless these aircraft are Herriet Jump Jets, they do create just as much negative externalities as others.

- "If the movements excluded from requiring a slot were also excluded from the movement cap, the legislation could be streamlined."

No, streamlining would result in violating the cap, which is outside the scope of the review.

- <u>Exclude aircraft from the movement cap during daytime if below noise level. Count only those for the 80 cap that exceed noise level.</u>

Yes, if and only if the noise level is set at 0 (zero) dB outside Sydney Airport arial.

- Exclude regional flights from the movement cap if a particular noise level is not exceeded.

No, the low noise level regional flight aircraft are flights and they are an important part of noise sharing.

C. Should any flights be excluded from the movement cap, while still providing a net benefit to the community? What impact would that have?

No. Obviously exclusions from the cap means the cap is no longer a cap. Since the cap is excluded from the review, no more needs to be said.

What is the net benefit?

C: No comment (Maybe people trust Airservices Australia more than they trust Sydney Airport)

4. Sydney Airport regional access regimes.

a) Ring fencing PRSS must be maintained for noise abatement reasons. Moreover, regional access to the City of Sydney would seem to be important on social cohesion grounds, to facilitate access to medical specialists, lawyers and other business beside family relations. If anything, more slots should be reserved for regional air services.

b) Northern Winter and Sommer is irrelevant for Sydney residents on the ground. Furthermore, there are debates in the EU about summer and winter time.

The bigger picture: Corona virus and Western Sydney Airport.

As was the case in 1996, the Australian governments' (Federal and State) immediate response to the outbreak of the corona virus pandemic was 'people first' and the policy announcements matched the economic insight in the expression 'people first'. The difference between 1996 and 2020 is that the governments had relevant information (and presumably the legal framework) at the right time.

The corona virus pandemic put a spot light on weak points in socio-economic systems, including aviation. I don't believe I have to provide references to support the view that all segments of the aviation industry, from Boing to Airbus, to airlines, and Sydney Airport have experienced an enormous crash in profits. Moreover some aviation employees have been stood down or put on jobkeeper. At the same time, all those in Sydney who have not suffered a significant financial loss but had suffered negative externalities from the operation of Sydney Airport have had the longest period of respite.

There is great uncertainty about the 'recovery' of the aviation industry and its time profile. I do not have a crystal ball.

On the assumption that share market prices do contain at least a little bit of useful information regarding investors' expectations, the share price data for Sydney Airport does not signal a 'full recovery' (something close to 2019 levels) any time soon as can be seen on the graph shown in the following link.
https://www.google.com/search?q=Sydney+airport+share+price&rlz=1C1CHBF_en-GBAU811AU811&oq=Sydney+airport+share+price+&aqs=chrome..69i57j0i457j0l6.145

Orders for aircraft would be another forward looking indicator.
Boeing: Expects 11% less demand for new aircraft over the next 10 years than a year ago; most new aircraft are for replacement rather than growth
Airbus: does not expect air traffic to recover to pre-Covid levels before 2023

There are several indicators that domestic aviation will recover first. The OECD expects domestic tourism to be driving recovery in the short term, which in the case of Australia would entail more domestic air passengers, given the geographic distribution of the population.

Qantas has stated it gets about 70% of its profits from domestic air services and expects to reach break even when State borders open. This is about now.
Virgin: Restructured under private equity ownership. Will use Boeing 737 fleet only. (Risk)
Rex: Wants to expand domestic services

The effect of countries and their populations taking a greater interest in ecological sustainability, including global warming, on the demand for air travel services is yet another uncertainty.

<u>I submit for consideration</u>

1. Given the scheduled completion date of Western Sydney Airport, this corona virus enforced break in the growth of capacity utilisation of Sydney Airport could be used to plan for a transition of the slots for international heavy aircraft from Sydney Airport to Western Sydney, conditional on item 2 below, and reworking the allocation of slots for regional and domestic aircraft with a view to increase noise sharing substantially.
2. While the data in the NATS link is helpful for the general public, it is not comprehensive. I believe it is important to prevent a repetition of the problems encountered with the capacity expansion of Sydney Airport. Specifically, in relation to Western Sydney Airport. In particular, the separation of the construction of the airport from the flight paths

determination should be avoided. This should include an extensive literature review in the acoustics and economics areas.

3. Any taxation funded assistance given to any part of the aviation industry should be made conditional on them being cooperative regarding item 1 above

How does it work now? It depends on whom you ask.

Ernestine Gross

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