



BACACG MEETING MINUTES

Location:	BAC HQ 11 The Circuit, Brisbane Airport
Date:	Tuesday 5 September 2023
Chair	Nigel Chamier AM
Attendees	<p>Nigel Chamier (Chair)</p> <p>Ron Brent (Brisbane Airport Community Airspace Advisory Board Chair)</p> <p>Daniel Ryan (Community representative for Federal Seat of Lilley)</p> <p>Geoffrey Warrener (Community representative for Federal Seat of Brisbane)</p> <p>Daryl Wilson (Community representative for Federal Seat of Bonner)</p> <p>Karilyn Beiers (Community representative for Federal Seat of Bowman)</p> <p>Dr. Sean Foley (Community representative for Federal Seat of Griffith)</p> <p>Capt. Andy Bauer (Virgin Aust.)</p> <p>Donna Marshall (AsA)</p> <p>Marion Lawie (AsA)</p> <p>Rachel Crowley (BAC)</p> <p>Stephen Beckett (BAC)</p> <p>Portia Allison (BAC)</p> <p>Gaynor Sipolis (BAC)</p> <p>Tim Boyle (BAC)</p> <p>Michael Jarvis (BAC)</p> <p>Dallas Heseltine (BAC)</p>
Attendees (online)	<p>Caroline Hauxwell (Community representative for Federal Seat of Ryan)</p> <p>Joshua Kindred (Community representative for Federal Seat of Petrie)</p> <p>Alex Redgrove (Federal Department of Infrastructure, Transport, Regional Development, Communications and the Arts)</p> <p>Annie Li (Federal Department of Infrastructure, Transport, Regional Development, Communications and the Arts)</p> <p>James Heading (BCC), Cassandra Sun (BCC)</p> <p>Michael Hawkins (Community representative for Federal Seat of Dickson)</p> <p>Capt. Dana Bradbury (Qantas)</p> <p>Chris Kang (Community representative for State Seat of Clayfield)</p> <p>Belinda Fenner (Aircraft Noise Ombudsman)</p> <p>Anthony Sapuppo (State Department of Infrastructure, Local Government and Planning)</p>
Apologies	<p>Glenn Cox (ASA), Scott Mitchell (Virgin Australia), Professor Laurie Buys (Community representative for Federal Seat of Moreton), Megan Thomas (Federal Department of Infrastructure, Transport, Regional Development, Communications and the Arts), Brendan Mead (Qantas), Daniel Fisher (ASA), Siobhan Cornett (ASA), Russell McArthur (ASA), Daniel Fischer (ASA)</p>

AGENDA ITEMS

10:00 am

Chair:

Welcome and Acknowledgement of Country.

Confirmed the minutes for the last BACACG meeting on 20th June 2023, and confirmed changes proposed by the community representative for the Federal Seat of Bowman (Appendix 1).

Welcomed guest Chair of the Brisbane Airport Community Airspace Advisory Board, Ron Brent.

BACACG Secretary Update

Portia Allison, Community Engagement Advisor at BAC and interim BACACG Secretary, provided an update of incoming and outgoing correspondence to the BACACG email inbox and incoming aircraft noise feedback.

BAC Update | Passenger + Community

Stephen Beckett, Head of Public Affairs at BAC, provided an update on passenger numbers and community related events that have happened since the previous BACACG meeting. Stephen provided an overview of new airlines and routes that have recently been announced at BAC, including announcements for:

- Emirates 2nd daily service commencing (significant increase in capacity)
- Air Vanuatu launch 1 per week to Espiritu Santo (Vanuatu) and VietJet commence Ho Chi Minh City (Vietnam)
- Qantas changed the schedule on Apia (Samoa) from 2 per week to 3 per week.
- Seasonal increases in frequency from Virgin Australia on Fiji and Queenstown for peak holiday periods and Qantas increased frequency on Port Moresby from 4 per week to 6 per week.
- China Southern Airlines confirms return to BNE 17 November 2023. This is an important link for family and friends but also tourism. The new ultra A-350 aircraft will be deployed which is 50% quieter compared to previous aircraft used, and 25% more fuel efficient.

Stephen advised that domestic passenger numbers are still below 100% of pre-COVID levels but are increasing, and international travel is increasing as well. Stephen also provided context for the slow return of international travel due to cost-of-living pressures and advised that latest figures show that the most common reason for travel to Brisbane is for leisure, second only to visiting friends/family.

Stephen provided an update to BACACG members on figures of international flights arriving and departing over the water which includes Emirates, Cathay Pacific and Singapore Airlines. Stephen advised that BAC is working with Airservices to mitigate noise impacts where reasonable and safe to do so.

Tim Boyle, Program Manager Future Airspace Strategy Lead at BAC, advised that he has been working with airlines on ways to decrease noise for late night flights which includes discussions about BAC's historical 10 knot tailwind allowance which was decreased after review by Civil Aviation Safety Authority (CASA).

Donna Marshall, from Airservices Australia, advised the importance of talking to airlines directly for changes to standard operations, like a voluntary increase of tail wind knot allowance as Air Traffic Control cannot instruct a pilot to take-off over the bay if the tail knot wind is above 5.

Stephen advises group on recent Community Engagement Activities undertaken by the Community Engagement Team at BAC.

Stephen advises group on feedback received by the Community Engagement Team since the last BACACG meeting in June. Key submissions were reported as Parking, Security Screening, and Kerbside Attendants.

The community representative for the Federal Seat of Brisbane advised the group of an Emirates flight on the 2nd July at 3.00am (Boeing 777) that departed from the Legacy Runway, headed southwest across Brisbane, about as far as Beaudesert, below 10,000 ft, and a rough calculation estimated 130,000 people would have been disturbed, the representative questioned why this happened as there were no other flights at this time. Donna advised the representative that details on that flight are not currently available and cannot provide specific information but does advise that sectors of airspace can become inoperable at times due to staffing.

Capt. Dana Bradbury, acting Base Manager Qantas, questioned why there would be a relaxation on the 250 knots below 10,000 feet. Dana has several screenshots of this, and she knows why the 250 below 10,000 is applied, but the data suggests that these are in excess of 285 knots on departure at 6,000 ft. Donna advised that due to lack of notice she is unable to answer this.

Dana advises this is something worth looking into to understand why the limitations in place have clearly been exceeded.

Brisbane Airport Community Airspace Advisory Board (AAB)

Ron Brent, Chair of AAB, introduces himself as the former Commonwealth Ombudsman and Aircraft Noise Ombudsman, he also chairs the Gold Coast CACG, and the Sunshine Coast Community Airport Forum amongst other roles with various airports.

Ron provides the group with an update on the role of the AAB.

Ron advised that the AAB has been set up to assist in community engagement for the Noise Action Plan for Brisbane, and the role is heavily focused on the action plan. Ron advised that the AAB will discuss ad-hoc issues where within the remit of the AAB but will refer relevant matters back to BACACG. Questions about aircraft noise improvement ideas or proposals will not be ignored, but the AAB will work to refer matters to the correct channels.

Ron advised the group that the AAB does not discuss aircraft movement caps and is not currently discussing curfew or compensation, matters are only discussed within the purview of the AAB's terms of reference. The AAB has had an effective role in helping the communications around that the proposals in Phase 2 of the Noise Action Plan for Brisbane, but has also raised ancillary issues e.g., trying to understand the full-length runway departure trial, to work out if it did effectively test the opportunities that arise from full length runways to reduce noise over communities.

Ron advised that discussions have included non-jet departures, with the focus on trying to move more aircraft over the water. Ron advised one of the big challenges is that noise improvement opportunities can be very complex and can involve disadvantage to some communities at the advantage of others. The aim is to fully understand where the community stands on some of those trade-offs.

Ron advised that the AAB board has been made up of representatives from a range of communities, including representatives with individual contributions and those representing a geographical location. Ron advised the following members are a part of the AAB:

- Tess Bignell
 - Sandra Bell
 - Kristen Stewart
 - David Diamond
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Ron advised that community representatives have links back into the community that will assist them to share the deliberations of the AAB. The meetings also include representatives from Air Services Australia, Brisbane Airport Corporation, the Federal Department of Infrastructure, Virgin, and Qantas/Jetstar. Ron advised that where relevant experts may be invited to the AAB for discussions on topics such as noise monitoring.

Ron advised that the AAB will provide formal notification via the BACACG Chair to the group on matters that should be addressed by the CACG and not the AAB. Ron reiterated that the AAB does not want to discuss issues already within the remit of the CACG and will make effort where possible to separate issues clearly across the two groups.

The community representative for the Federal Seat of Brisbane queries how the AAB can talk about outcomes when they cannot discuss curfews or limiting flight numbers. Ron responds that the perspective is legitimate and that he has taken the role even with both options off the table but believes there are still ways to work with the community to get better outcomes on other issues such as more flights over the ocean. Ron advises that he understands that the community would like a curfew, but also acknowledges that the terms of reference for the AAB do not allow discussion of the topic and the rules from his position cannot be changed.

The community representative for the Federal Seat of Griffith advised that he has assessed the impact of aircraft noise on Brisbane (Appendix 2) and questions whether Ron has received a copy. The representative advised that the assessment had to be conducted through different methods as the Environment Impact Study was incorrect. The representative advised that the group would not be able to work on comparing routes since the information in the EIS is incorrect. The representative queries whether conducting research or investigations into accurate noise contour models for Brisbane is within the remit of the AAB.

Ron advised that there is not a simple answer for the representative's question but does note that one of the AAB members (David Diamond) has strongly advocated on the same point. Ron advised that the topic of information and data was a key item on the draft agenda for the next meeting of the AAB and would be discussed.

Donna advised that one of the recommendations of the Noise Action Plan for Brisbane was to develop a baseline model that would present both pre and post New Parallel Runway operations in a comparative form so the two could be assessed. The model has been completed and is being review by the AAB. The AAB can then ask questions about the data to ensure that they feel confident that what AsA have put together is useful and accurate. Once consultation with the AAB has concluded it will be publicly accessible. Donna advised that she is hopeful that it is going to address what the community want, as it is based on actual operations, not modelled information like the EIS.

The community representative for the Federal Seat of Giffith asked if the noise contours are the result of field measurements. Donna advised that it is based off information provided by noise monitors. Donna acknowledged that noise monitors are not everywhere but with the data available they can project what noise levels in unmonitored locations are. Donna confirms that this is based on actual operations and not modelled forecasts.

The community representative for the Federal Seat of Griffith states that his understanding is that noise monitors measure an average noise, not an instantaneous peak noise. Donna advised that they provide a maximum noise level not the average. Donna advised that AsA are in the process of putting together a paper that explains the noise monitoring and the type of data collected.

The community representative for the Federal Seat of Brisbane stated that people don't realise that an aircraft lays an 11K trail. Everything within that 11K trail at 50 DB is impact.

Chair thanks Donna and looks forward to receiving the paper. Donna advised it will be released before the next BACACG meeting, but they are happy to take feedback and it can be spoken about next quarter.

The community representative for the State Seat of Clayfield thanked Ron for the initiative and wants to check which representative would be representing the area of Pinkenba and surrounding suburbs. Donna confirms that the representative is Sandra Bell.

Chair thanks Ron for his contribution and invites him to stay for the remainder of the meeting.

Department of Infrastructure, Transport, Regional Development, Communications, and the Arts update

Alex Redgrove, from the Department of Infrastructure, provided an update:

- The Government has committed to developing a White Paper for the future growth and development of the aviation sector. The Aviation White Paper will include consideration for a range of issues. The Terms of Reference for the White Paper were confirmed in March and submissions for the Green Paper will be open to the public shortly. The White Paper is set to be released in the first half of 2024.
- The Government has established an Australian Jet Zero Council with representatives from major airlines, manufacturers and government partners. The Council includes a rotating set for airports, which is currently held by BAC's CEO Gert-Jan. The Council held its first meeting on the 15th of August 2023 at Brisbane Airport. Key discussion points include decarbonisation efforts and establishment of a work plan for the Council. The Council is a part of the government's ongoing commitment to work with industry to reduce emissions and expand sustainable industries. Information about the Council can be found on the Department's website.

The community representative for the Federal Seat of Griffith queried why there were no community groups on the Jet Zero Council. The representative advised that there are no community groups around major airports in Australia that are satisfied with the Department's transparency. Alex advised that the Council is about decarbonising aviation, so the group is made of key players in that sector and includes a range of partners from across the fuel sectors. Alex encouraged the representative to view the membership on the Department's website. The representative advised that the Department should reconsider as they are excluding the community. Alex advised that the feedback will be passed on.

Rachel Crowley, Executive General Manager of Communications and Public Affairs at BAC advised that when submissions for the Green Paper are open the Secretary will circulate the link to community representatives.

The representative for the Federal Seat of Brisbane requested that Alex pass onto Minister Catherine King that the liveability of Brisbane has been destroyed and pointed to the Robodebt report as an example of repercussions. The Chair noted the representative's comment.

Airservices Australia update

Marion Lawrie, from Airservices Australia provided an update and response to Action Items from the previous meeting.

- Provided an update on WebTrak service and that there is a function to report and provide suggestion on specific aircraft.
- Marion provide an update on Noise Complaints and Information Service (NCIS) for June to August and advised that complaints have increased but the number of complainants has not had a linear increase. Marion advised that Balmoral, The Gap and Tingalpa were the suburbs with the highest number of complaints. Marion also advised that information about complaints is publicly available on the AsA website. Donna advised that suburbs with high complaints, but low complainants are noted but data shows all complaints regardless of the number of complainants.
- Marion advised that complaints can be related to factors such as seasonal changes in weather and the impact of staff shortages.

Dana advised of an issue with restrictions for arrivals into Brisbane and Donna advises that the issue is technical and would take the discussion offline.

Donna advised that there are several forums where AsA speaks with airlines to identify ways to improve operations and that questions around complex operational procedures for pilots and Air Traffic Controllers should be discussed then. Updates from these forums can be provided to the community where possible.

Noise Action Plan update

- Marion advised that AsA is currently in Phase 2 of engagement on the Noise Action Plan for Brisbane and four key topics are being discussed. A pack on these topics was provided to community representatives in the meeting. Packs are available on the Noise Action Plan webpage.
- Advised that Phase 2 is discussing options discussed in Phase 1 of the Noise Action Plan for Brisbane, including Simultaneous Opposite Direction Parallel Runway Operations (SODPROPS), as well as new options including night-time overland departures north. Noise Sharing is also a large consideration for the Noise Action Plan and is being discussed as a part of community engagement sessions. Phase 2 is also discussing improving and increasing operational reporting for transparency to the community.
- Marion advised that AsA have conducted 14 community drop-in sessions that were supported by BAC staff and attended by community members. 2 online sessions have also been held with a third to be held after the meeting. Approx. 150 people had signed up to each session.
- Update on the community engagement sessions will be provided via the Engage platform on the Airservices website.
- AsA have received feedback on communication approaches and made changes to their program of works which included mailbox drops after feedback from the community. However, some members did respond negatively to the use of paper.
- Marion advised that AsA will be re-releasing the baseline model once completed.

Response to Actions

- In response to the community representative for the Federal Seat of Ryan's question about raw noise monitoring data raised in the June meeting, Donna advised that the data is not something that is able to be shared. Due to the raw noise monitoring reports being open to misinterpretation and confusion if not fully understood. Donna confirmed that noise monitoring reports are prepared by experts that use consistent data and language to support meaningful discussions. Donna advised that information like this can be discussed within the AAB and appropriate information be referred to BACACG.
 - Donna advised that AsA is doing modelling and using an Aviation Environmental Design Tool (AEDT) which is a U.S. Federal Aviation Authority developed tool. It is both internationally used and recognised as the best available tool for noise modelling. Donna advised that noise modelling is only a forecast and is done during the process of an Environmental Impact Statement (EIS).
 - Donna advised that the forecast from noise modelling is done at the time with the best available information, but it does not mean it will end up the exact same in practice. Donna advised that the noise monitors report on the peak noise level and is reporting the loudest noise at the time an aircraft passes over the monitor. Donna advised that this can show as a difference between the noise monitors and the EIS because of the varying types of aircraft flown. Not every factor was apparent in the EIS for the Brisbane Airport New Parallel Runway and the Post Implementation Review (PIR) report does have a section that compared the EIS to the final flight path design.
 - Donna advised that Airservices and BAC work close together on a temporary noise monitoring program and currently have three temporary noise monitors in the community in Upper Brookfield, Brookfield and Taringa. New locations are being assessed.
 - In response to the community representative for the Federal Seat of Nudgee's questions about the impact of Phase 1 of the Noise Action Plan for Brisbane's impact on Nudgee Beach in the June meeting, Donna advised that there isn't currently specific information for Nudgee Beach. Donna advised that there were two methods that may impact the area, including SODPROPS and departure paths (taking off over the water). The modelling for Nudgee Beach departure paths shows that aircraft would reach the area at approx. 16,000ft and there is not expected to be a
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significant change in noise for the area. Donna advised that there is another proposal for non-jet traffic to arrive via alternative pathways.

Donna explains baseline modelling for Moorooka and the purpose of baseline modelling to show historical as well as helping forward planning when proposing further options to show how they may impact specific addresses.

Donna notes, this information won't be available until it is taken to the AAB, updates are made and then it will be released. Any questions can be then bought up in this forum.

Questions

- Questions from Community representative for Federal Seat of Ryan:
 - The representative noted that they were told in the community meetings that noise sharing will result in some of us having a "night off". The representative queries how will this work in practice and who will manage that program? How will you manage noise sharing so that suburbs close to, but not directly under an alternate flight path, will not be affected?

Marion stated that during that phase of engagement AsA asked the community for suggestions or recommendations on how that may work. From these discussions, AsA have been hearing a lot that people just want it to be fair. Some feedback from community is that they want one weekend off a month, others say a couple of nights a week.

The representative noted that the noise meters in place at Taringa (now gone) and Brookfield show that noise exceeds maximum noise in the models used to inform communities as part of your current engagement, not the EIS. The representative queries when will ASA update those noise models to explain to communities what the actual maximum noise, they will expect based on the actual data that you have, not the original EIS, so that they can understand fully what the impact of that noise will be.

Donna responded that the data that they are using isn't from the EIS, it is based on modelling that they've done on each of the options. Donna also noted that some aircraft have higher noise readings which you will see as they go over those metres occasionally. The options phase is a high-level assessment. AsA haven't done the normal level of detailed environmental assessment that they would do for a final flight path change proposal, as that would come in the next phase. Donna notes that the noise measurements that are in the fact sheet say greater than 70 decibels, they don't say 70 decibels, so if there's an aircraft going over 75 decibels then that is greater than 70 decibels.

- The representative asked if raw noise monitor data can be accessible to the public.

Donna advised this isn't available. (Refer to noise monitor discussion above). The reporting interpretation is done by acoustic experts. AsA is working with the AAB on how to approach raw noise data, and an update will be provided after the discussion is held with the AAB.

2025 Master Plan Community Representative General Business and Discussion

Michael Jarvis, Head of Airport Planning at BAC, provided an update on the Brisbane Airport's 2025 Master Plan (MP). Michael advised that Australian Airports are regulated and governed by the *Airport Act*, which required airports to have a published MP, the last one done by BAC was in 2020. The MP sets out a number of things including the development intent of the airport noise exposure forecasts. Also includes a Ground Transport Plan and an Airport Environment Strategy.

The growth in Southeast Queensland and Brisbane are growing so the growth in passenger numbers is supporting that.

- There are around 20,000 jobs on airport, across various businesses and this forecast is set to double over the period forecast in the MP.
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- The underlying economic factors that underpin the MP, and the importance of then why the airport needs to set out its intent for how it intends to meet growth but then also cover some of the impacts, road congestion and aircraft noise.
 - Discussion on the third terminal to the north of the Domestic Terminal and long-term plan with Brisbane City Council and Transport and Main Roads regarding public transport network.
 - Michael discussed planning around the balance between terminal precincts, industrial parks and commercial developments and how they will work together.
 - All MP's must have an Australian Noise Exposure Forecast (ANEF) that are calculated and underpinned by the Australian Standard 2021 which is a framework based on what type of building activities you can have based on forecast noise levels, the measured decibel level of what an aircraft will be, flight tracks that are followed and then providing or imposing particular weightings on those movements, whether they occur during daytime or nighttime. This goes into the Brisbane City Council and State Planning frameworks, and they define the types of development that can occur.
 - Michael explains the Airport Environment Strategy (AES). Content of the AES is driven by requirements set out in the *Airport Act*.
 - MP engagement – there will be a formal 60-day public comment period of the Preliminary Draft Master Plan which members of the public are invited to provide written comment to BAC on the Preliminary Draft. Engagement with BACACG group will continue throughout the preparation of the MP. The Public comment period will likely occur between August and October 2025.
 - MP timing discussed and extension of the MP requested to enable the incorporation of the outcomes of the PIR within the ANEF and to allow for better integration of public engagement activities across the MP and Terminal 2 Precinct MDP.

Questions

- Anthony Sapuppo, State Department Infrastructure, Local Government and Planning, advised the Group that the SE Queensland Regional Plan is in review and out for public comment. Submissions close end of September and the document covers residential growth, transport etc.
- Anthony advised that the plan is separate to BAC's MP.
- The community representative for the Federal Seat of Brisbane asked whether global warming is considered when developing the MP.
- Michael refers to Federal Department of Infrastructure's presentation and the Jet Zero Council which is for aviation globally and how sustainability is a huge part of our planning at Brisbane Airport and says that BNE has been a leader in terms of scope in this regard.

Community Representatives General Business and Discussion

In General Business, the following items were discussed:

Chris Kang (Community representative for State Seat of Clayfield)

- Pinkenba Community Association (PCA) raised issues in relations to odd smells in the area. Swift response from BAC who advised this was due to the mangroves in the area which was common at this time of the year.
- BAC have a planned visit to PCA for a community presentation/update on the airport.

Michael Hawkins AM (Community representative for Federal Seat of Dickson)

- The community representative notes that his community are still very actively engaged in monitoring aircraft noise through its local progress association, and states that they are very lucky to have a local representative elected to the AAB, so they have chosen to prosecute issues re aircraft noise via that Board.
 - Other issues are accessibility and constant complaints regarding drop off areas at the terminals and a question on if it is possible to have split lanes for pick up and drop offs at the Domestic Terminal.
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Michael Jarvis respond that congestion is something that is monitored on a day-to-day basis and as congestion builds some of those lanes are used more than others. BAC continuously monitor to see if those roads aren't queuing back through the traffic lights on onto Moreton Drive. The reason why there aren't separate drop off and pick up lanes is because is if you have them separate, what often happens is a really highly used departure drop off at one time of day and then not very well used arrivals road and then vice versa later in the day. This will continue to be monitored and there are plans to reallocate some of the lanes to get better utilisation from pick up and drop off roads.

- The representative queries if Qantas plan to reopen its Valet Car Park. Stephen adds that was also a question from Max Chandler-Mather and it has been raised with Qantas.

Karilyn Beiers (Community Representative for the Federal Seat of Bowman)

- The community representative spoke of the concern regarding nighttime flights, SODPROPS and flights over Redlands. The Redlands community has raised concerns on this as the flights were to go above the red line, but it is still drifting down over the Redlands on occasions, particularly the Doha and LAX flight. The Community do not understand why it must loop around when the flights are already taking off to the north with the flights going to the USA or Europe.

Donna confirms that there is still drifting south because these flights are still using the pre-existing flight path. It must loop around as it's a path used to go to the north when it's in SODPROPS mode, so simultaneous opposite direction, parallel runway operations, departures are off the Legacy Runway arrivals into the new runway. AsA can't depart an aircraft this way because there are arrivals coming onto the new runway, and that's why it must loop around and go that way to maintain separation between arriving aircraft and departing aircraft that are actively flying head-to-head.

The representative queries why at night when there are little flights there isn't the opportunity to send them straight out instead of looping and flight paths should go out over the ocean, particularly because of the proposition of the first proposal and Phase Two to keep flights out over the water (i.e., ocean). States that there needs to be better understanding from AsA. Donna responded that the answer is multifaced including considerations on destination port; military restricted zones over the water; strategic separation. Donna briefly discussed the design options that will be presented in Oct/Nov.

- The representative also advised that AsA continues with not including a postal address on all their paperwork, which results in people without a computer not being able to provide feedback. Donna confirms they are looking into it, and they are putting a postal address up on their site.
- The representative is concerned about advertising timing of AsA drop-in sessions in the new local paper. Donna states that they are aiming for four weeks' notice where possible (dependant on publishing deadlines), two weeks at minimum.
- The representative requests that the Southern Moreton Bay Islands not be referred to as unpopulated. Donna states that it is never referred to as unpopulated but rather greenspace and the representative acknowledges this and will take that back to her group.

Daryl Wilson (Community representative for Federal Seat of Bonner)

- The community representative advises there is no community paper in the southern suburbs. Petition over the last few months regarding early turning flights over Wynnum Manly in bayside which has been submitted to Minister King and AsA, hoping for positive response.

Donna comments that AsA does not have this. Donna to follow up and email to the representative.

- The representative advises that there is currently an online petition running phase two northbound overland departures at night, impacting Belmont, Chandler, Gumdale, Wakerley, Rochdale and Carindale which will also go to the Minister in time.
 - The representative noted that a community letterbox drops to get more awareness of the proposed flightpaths.
 - The representative notes that Ross Vasta has been very active in the community consulting with people, running forums, meetings and getting general feedback.
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- Marion advises there is a standing offer of a briefing from AsA to all elected representatives.

Geoffrey Warrener (Community representative for Federal Seat of Brisbane)

- The representative has provided a short submission which includes a few typical letters from aggrieved community members. Submission provided to all attendees (Appendix 3 and 4).

Daniel Ryan (Community representative for Federal Seat of Lilley)

- The community representative is interested in advance notice of any upcoming Community Consultation so that people can attend.
Marion states that emails are sent from AsA to elected members when an event is upcoming. This email asks that the information be shared along, and also offers a briefing.
- The representative questioned land use planning and potential for permanent accommodation to assist the housing crisis. Michael Jarvis stated there are no plans for permanent accommodation on the airport.
- The representative expressed there was confusion around passenger drop off and pick up and the hope that this will be improved and part of the Masterplan. Reference also made to Terminal Three and questions around wayfinding. Michael states that the terminals may be called Terminal 1,2,3, which would be communicated on your boarding pass. Wayfinding and communication will be key.
- The representative asked what is happening with the Automall. Michael responded that Automall is not going ahead, and this land will likely be used for mix of commercial and entertainment uses (not industrial).
- The community representative asks about northern access to airport. Michael stated there are currently two accesses to the airport and when the airport developed the northern access route it connected to the Gateway Motorway. If a third is required, it will most like be an extension of Kingsford Smith Drive.

Dr. Sean Foley (SF) (Community representative for Federal Seat of Griffith)

- The community representative queried why flight paths were designed with 2km widths when the impact of a jet aircraft is approx. 11km wide at 3,000ft.
Donna responded that the 2km wide path is not related to noise impact but is instead used to calculate the population directly overflown, and it has been noted that the noise will extend well beyond the boundary of that 2km.
 - The community representative noted the impact of noise above 55DBA to health and reviewed the literature that was submitted, however noted that much work has been done in the past ten years and Australia needs to take on medical evidence of what happens with aircraft noise now being understood. Notes that Australia is lagging well behind in responding to the aircraft noise and impact on health. The representative further states that WHO recommendations in Europe (daytime 55 DBA maximum, night time 45 DBA, and preferably 40 DBA) and that there are strategic issues to deal with here that don't have to do with particular flight paths, they have to do with the whole approach, and that, 70 DBA is still being used, it should be N55. The representative also notes that it would be a sensible idea to do medical monitoring on the population in Brisbane to see how people are being affected.
 - Donna responded that AsA have been looking into the WHO measurements, and they are happy to provide more information at the next BACACG meeting.
 - AsA are looking at it now to understand what implications it may have for our future considerations, but the International Civil Aviation Organisation hasn't adopted it and the rest of the global airspace community haven't. This is still a work in progress. Donna explains the reason AsA use 70 and 60 DBA in their publication materials is because under the Environment Protection and Conservativity Conservation Act, they're the triggers for environmental significance, these are used to share that information, but it doesn't mean that those lower noise levels don't have any implication for communities.
 - **Chair** comments that the community representative has put some very comprehensive notes together, and that the group should read these.
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Close Meeting | Final Comments from Chair

- The Chair thanks everyone for their attendance and thanks the Presenters.
- Thanks to all of the Members for their questions and those who made the effort to put papers together, and he hopes the group will read these and acknowledge this effort.

Meeting closed at 12:00pm

The Chair invited informal discussion and welcomed guests to stay after the meeting.

Next meeting 28 November – Action items below carried forward to next meeting.

Action Items	Owner(s)	Deadline	Status
Capt. Dana Bradbury, acting Base Manager Qantas, questioned why there would be a relaxation/ why limitations have been exceeded on the 250 knots below 10,000 feet.	AsA	Offline	Completed
AsA noise monitoring paper will be released before the next BACACG meeting. Opportunity to be spoken to at next quarterly meeting.	AsA	November meeting 2023	
Circulate link to submissions for the Green Paper to community representatives.	BAC		Completed
Capt. Dana Bradbury advised of an issue with restrictions for arrivals into Brisbane.	AsA	Offline	Completed
Noise monitor raw data: ASA is working with the AAB on how to approach raw noise data, and an update will be provided after the discussion is held with the AAB.	AsA		In progress
Questions put forward by community representative for the Federal Seat of Brisbane: <ul style="list-style-type: none"> • Health implications of aircraft noise – AsA have been looking into the WHO measures and can provide more information at next meeting 	AsA	November meeting 2023	In progress
Community representative for the Federal Seat for Brisbane requested for the Department of Infrastructure, Transport, Regional Development, Communications and the Arts to respond to his 'infrastructure petition'.	Department Infrastructure, Transport, Regional Development, Communication s and the Arts		Completed

APPENDICES

Appendix 1.

KARILYN BEIERS
BACACG Representative for Bowman

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29 August 2023

BRISBANE AIRPORT COMMUNITY AVIATION CONSULTATION GROUP

Ms Portia Allison
Secretary
BACACG
Brisbane Airport

Dear Portia

Letter to be Tabled for Meeting on 5 September 2023

I refer to my emails to Alaina Megson and yourself regarding the amendments I requested to the drafts of the June minutes.

The amendments were not as requested and I was subsequently advised to raise this at the September meeting.

I set out below wording from prior emails:

My email of 29 June set out deletions and insertions, including the following insertion:

insert - 'over the ocean' or

It also included the full wording of the sentence by way of clarification as hereunder:

The representative also requested that language be clarified around flights going out 'over the water' to instead be 'over the ocean' or 'over the bay' (if they are travelling along the bay) to differentiate between the intended routes.

Those words were not included in the second draft.

The requested amendments were to differentiate between routes and are quite significant.

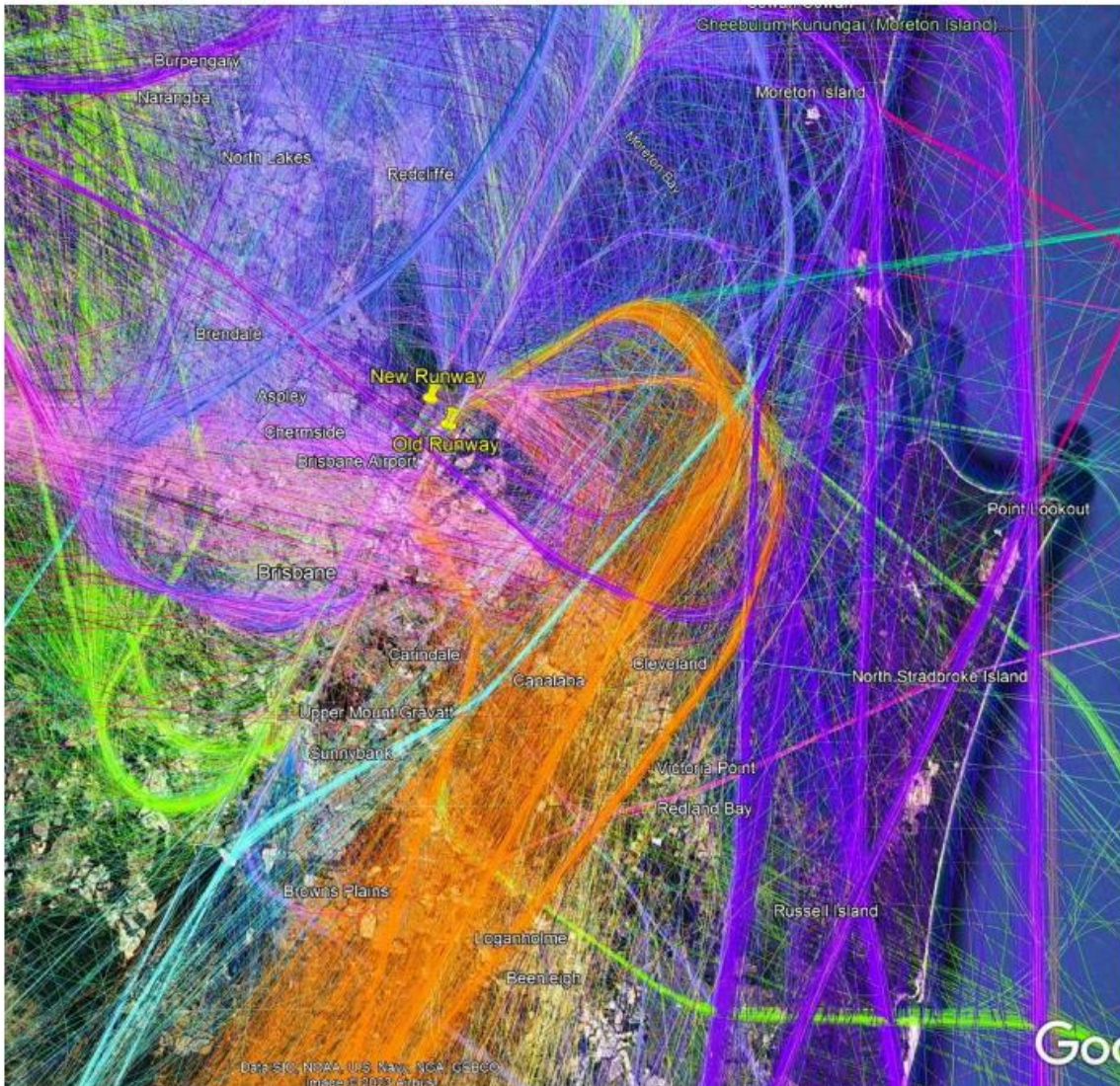
Please ensure the records reflect the wording of the sentence as underlined above.

Thank you for your assistance.

Yours faithfully

KARILYN BEIERS

Brisbane – Aviation Noise Pollution and Public Health



Sean Foley BSc (Hons) PhD FRGS, August 2023

Brisbane - Aviation Noise Pollution and Community Health

Scientists believe that pronounced fluctuations in noise levels like this might compound the effects on the body. They suspect jarring sounds that break through the ambience — recurring jet engines, a pulsating leaf blower, or the brassy whistle of trains — are more detrimental to health than the continuous whirring of a busy roadway, even if the average decibel levels are comparable. ([NYT](#), 09Jun23)

Aircraft noise, the most health-threatening source of noise pollution among all modes of transport, is a stressor with identifiable effects on occupants' well-being and social behavior at airports and environs. ([Faiyetole & Sivowaku](#), 2021)

This briefing note is a first step in a process of estimating how Brisbane residents are afflicted (afflicted, not just affected) by aircraft noise pollution from the operations of Brisbane Airport Corporation's (BAC) airport and the aviation industry. The briefing sketches some preliminary estimates of health-economic costs ('externalities') imposed on Brisbane residents by this uncontrolled aviation noise pollution.

The briefing is in two main parts:

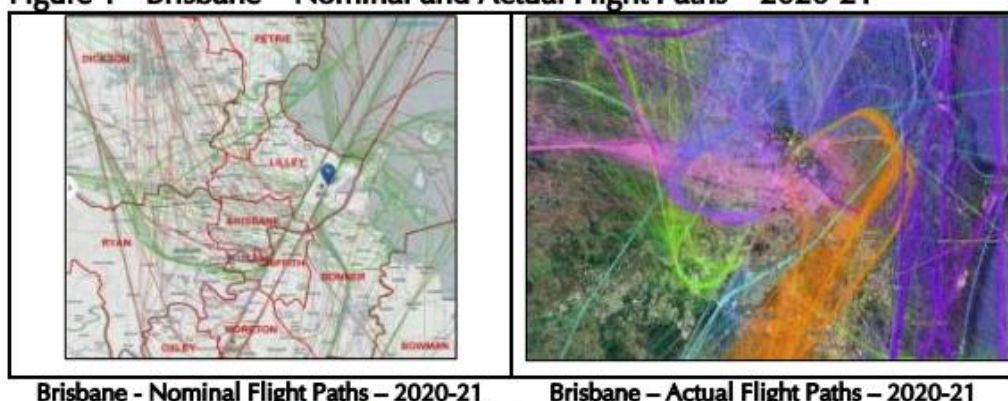
- Part I, description, illustration and analysis of the aviation noise pollution that is afflicting about half of Brisbane's residents, including dangerous noise levels as recorded by the aviation industry; and
- Part II, review of recent scientific literature explaining the effects of chronic and excessive aircraft noise on human physical and mental health.

Introduction

We are not concerned with aircraft noise per se, but with the effects of chronic and excessive noise and other aviation pollution on the health and wellbeing of Brisbane residents. The scientific literature available prior to Brisbane Airport Corporation (BAC) preparing the Environmental Impact Statement (EIS), specifically the [Health Impact Assessment](#) in 2005-06, already partially identified the health and social impacts of aircraft noise. By 2020 when the new runway started operating, the scientific evidence was overwhelming. Ironically, a substantial part of the scientific work (epidemiology) was based on Schiphol airport in the Netherlands, home of a major shareholder (~20%) in BAC, previous employer of the current CEO, Gert Jan de Graaff. There is no plausible way, since at least 2002, that Schiphol senior management could not have been aware of the results of this evidence regarding the serious health impacts of chronic exposure to aircraft noise. In planning the new runway and flightpaths it is clear they chose to ignore this evidence, and the damage and suffering that operation of the new parallel runway would certainly cause, in favour, they probably thought, of greater profits.

Two maps below illustrate the extent of aircraft noise pollution that afflicts Brisbane residents. These clearly show aircraft noise is experienced all across the city, not just under the major flight paths - it 'blankets' Brisbane. For far too many people it severely affects their physical and mental health, wellbeing and amenity, as evidenced by BFPKA's online [surveys](#) in 2021 and 2022. In brief, for Brisbane aircraft noise is a *major public health issue*.

The maps below approximate the extent of aviation noise pollution for Brisbane for 2020-21, even when the pandemic severely restricted air travel. The map on the left shows nominal flight paths – 'nominal' as aircraft deviate from these for a variety of reasons, on the right the swathes of actual flight paths recorded by Open Sky Network.

Figure 1 - Brisbane – Nominal and Actual Flight Paths – 2020-21

Sources: [AsA 2020-21](#)(left), [Open Sky Network 2020-21](#) (right). Notes: the AsA diagram fails to show the complexity and density of flight paths across Brisbane. However it clearly illustrates a significant number of suburbs, and people, lie under major flight paths to and from the airport.

In Brisbane most residential suburbs are blanketed by aviation noise pollution from operations at Brisbane airport – only a minority are free of aircraft noise. Many are exposed to noise levels far greater than those considered safe by [WHO Europe](#), the UK [Civil Aviation Authority](#) (CAA) and many independent, peer-reviewed and published research studies, a number of which will be referenced later in this briefing paper.¹

In summary, there can be no doubt that Brisbane residents, even those in periurban locations 30-35 km from the airport, are subjected to chronic, frequent, excessive levels of aviation noise pollution.² The residents most affected are those closest to the airport and under the main flight paths (really swathes). But as commercial flights increase, with flight paths criss-crossing the city, there are ever fewer locations free of aviation noise pollution. The extent of these quiet areas will shrink further, if BAC and major airlines are allowed to realise their ambitions for endlessly increasing the number of flights. As a consequence ‘externalised’ health, social and economic costs will continue to increase, while the airlines and BAC’s incomes and profits will likely climb.

Part I – Brisbane: Extent and Severity of Aircraft Noise Pollution

Table 1 below provides preliminary estimates of the number of Brisbane residents afflicted by aircraft noise in 2023, overall, over of half Brisbane residents, some 1.39 million people (54%). We estimate about 671,000 (26%) people are moderately afflicted and some 242,000 (9%) severely afflicted. This is far greater than predictions made by BAC in their 2007 EIS, which AsA and the federal government accepted without comment or question. The methodology for making these estimates is described below. Table 2 provides a summary of the number of suburbs afflicted by different levels of aircraft noise.

These are deliberately conservative preliminary estimates. They illustrate that about half of Brisbane’s residents are afflicted by aircraft noise, and almost 10% afflicted by severe aircraft noise caused by dozens of low altitude overflights each day. Given the physical and mental effects of excessive, chronic aircraft noise are well known (see Part II) Brisbane is now faced with a major public health problem that has yet to be recognised and addressed effectively.

¹ Apologies for any mistakes or oversights that remain. Substantive issues will be addressed in the following briefing notes.

² Aviation noise pollution is used as a short-hand, and includes noise, toxic gasses and toxic particulates.

Table 1 - Brisbane – Preliminary Estimates of the Number of Brisbane Residents Afflicted by Aircraft Noise 2023

Flight Path Severity	North & West		Southerly		Overall Total			
	Arrivals	Departures	Sub-Total	Arrivals	Departures	Sub-Total	No. People	% BNE pop.
Slight							472,000	1.8%
Moderate	144,000	193,000	337,000	173,000	178,000	333,000	671,000	2.6%
Severe			183,000			58,000	242,000	9%
Totals	144,000	193,000	510,000	173,000	178,000	391,000	1,385,000	5.4%

Sources: Based on list of suburbs from AsA Senate Estimates listing of complaints (~14,000 total) by suburb, *ibid*; flight paths logged from FR 2.4 radar tracks in mid 2023; population, ABS Census 2021. Notes: Numbers have been *rounded down* to nearest thousand to minimise possibility of over counting; 'slight' is from AsA list of suburbs and not under flight paths, 'moderate' from suburbs under one major flight path, 'severe' from suburbs under two major flight paths.

Table 2 - Brisbane - Suburbs Afflicted by Aircraft Noise 2023

Flight Path	N & W	Southerly
Slight		74
Moderate	30	32
Severe	22	6
Sub-Total	52	38
Overall Total	164	

Sources: as above

Residents Afflicted by Aviation Noise Pollution

The preferred approach, as used for a similar exercise with Brussels airport (see below), is using detailed aircraft noise contours overlain with urban population within each contour to estimate the population afflicted by differing noise intensities. Because reliable and up-to-date noise contour maps are not available for Brisbane, either from AsA or BAC, we needed to develop an approach by making use of limited information available. It is clear people living in suburbs overflowed by the main flight paths are more seriously afflicted than others, and suburbs overflowed by both arrivals and departures flight paths the most severely afflicted.

At [Senate Estimates](#) in late 2022 AsA identified 226 suburbs in greater Brisbane from which they had received some 14,000 aircraft noise complaints. This is more than the total number of suburbs in Brisbane City (190), as AsA also received complaints from Redlands, Logan and Moreton Bay communities. We assumed these are, at a minimum, the suburbs afflicted by aircraft noise from overflights at least some of the time. The city-wide extent of complaints makes it clear Brisbane is indeed 'blanketed' by aircraft noise.

We assumed people in suburbs identified by AsA are at a minimum '*slightly afflicted*', those overflowed by a major arrival or departure flight path '*moderately afflicted*', and those overflowed by both arrival and departure flight paths '*severely afflicted*' by aircraft noise. We recognise these categories are broad but are probably the best approximations that can be made without public access to accurate and reliable noise contour maps based on actual field measurement, as opposed to models.

Approximately 242,000 people in 28 suburbs are estimated to be severely afflicted, and overflowed up to 80-100 times per day on average, according to AsA's own data (see Table 3). This underlies the fact it is *chronic, frequent, excessive (>55 dBA) aircraft noise* that research has definitively shown is the cause of major physical and mental ailments. This was locally evidenced by data from BFPCA's two online surveys in 2021 and 2022 (op cit) in which some 75% of respondents reported mental health problems for themselves and their families associated with frequent, excessive aircraft noise.

In summary, aviation pollution is causing major, unaddressed and largely hidden public health problems in Brisbane. Here we are only dealing with the effects of aircraft noise, but overseas research makes it clear toxic gases and, especially ultra-fine particles (PM_{2.5}), which can contain harmful chemicals and heavy metals, also pose significant health problems. The EIS prepared by BAC, and signed-off without comment by AsA in 2015, clearly failed to accurately estimate the actual extent and severity of noise problems, with noise pollution blanketing most of Brisbane, and toxic particulates affecting north-western suburbs, for example. Figure 2 illustrates the extent and severity of noise pollution in Brisbane caused by aviation operations.

It is now over three years since a new pattern of operations at Brisbane airport commenced. Despite continual efforts by community groups, especially Brisbane Flight Path Community Alliance (BFPCA) there has been little progress in resolving the problems caused by significant increases in aircraft noise. Indeed, the addition of middle-of-the-night flights by Qatar's and Emirates' A380/B777 services to Doha and Dubai, for example, the situation for night time noise has significantly worsened. The federal, state and local governments and BAC strenuously oppose the imposition of curfews, movement caps or operating plans, measures that would begin to address these public health problems that especially afflict children.

The airlines and BAC attempt to remain invisible behind lack of effective government regulation and performance standards regarding aviation pollution control, reduction and management, covertly shifting health and other pollution costs onto Brisbane residents. While it is true government regulation is almost totally lacking - a deliberate 'design feature' of the Australian aviation industry - this does not absolve aviation corporations from their responsibility for taking

substantive initiatives to protect Brisbane residents, and those of other cities, rather than exploit this lack for private profit.

Estimation Methodology

We do not consider AsA's list of afflicted suburbs to be complete, as there are other suburbs where residents have reported to BFPCA they are afflicted by aircraft noise (see Annex 3). Despite these omissions we used AsA's listing as a *minimum* starting point in our analysis; the list may be refined in later analyses.

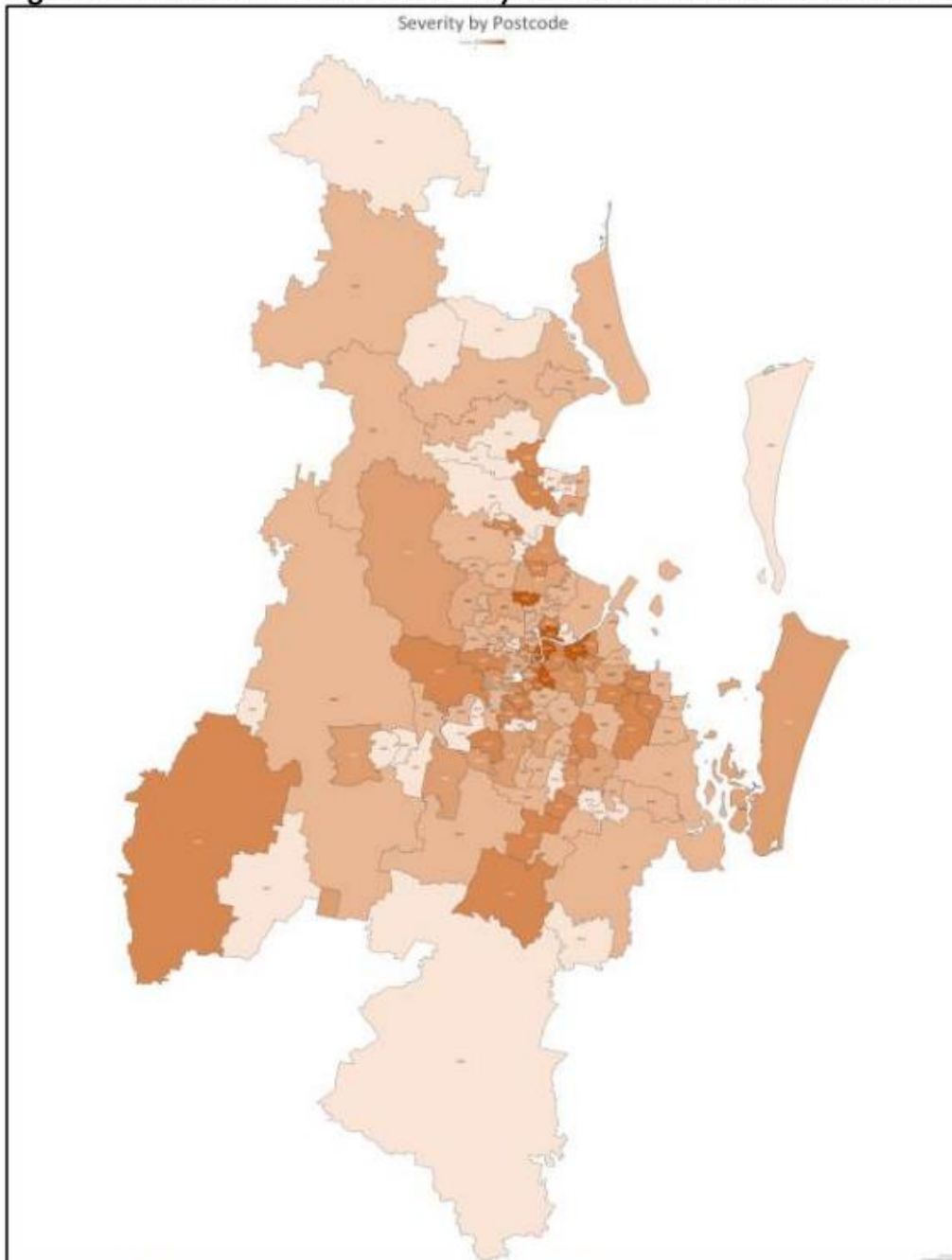
As a necessarily conservative judgement for this preliminary assessment, we class all the suburbs identified by AsA as being at least '*slightly afflicted*' – i.e. with overflights, noting there can be considerable variation in noise levels within a suburb, depending on whether aircraft pass directly overhead or adjacent; this can change unpredictably depending on the weather and other factors. Topography, for example, can also affect the perceived noise levels, as valleys appear to amplify noise levels. The slightly afflicted suburbs do not include the moderately or severely afflicted suburbs, as discussed below.

There are two large groups of people who are more significantly afflicted. First, residents whose suburb is under one of the main flight paths overflown by either arrivals or by departures, but not by both flight paths. We assess these suburbs as being '*moderately afflicted*', there are some 62 suburbs under either arrival or departure flight paths. Second, there are suburbs under both major arrival and departure flight paths, we assess these as being '*severely afflicted*', there are about 20 suburbs under both major flight paths. We note that in at least some cases, possibly many, this may be an underestimate of the extent of moderate and severe noise pollution that people experience, and this list will probably need to be revised in later analyses.

There is, in fact, another sub-category of suburbs severely afflicted suburbs close to Brisbane airport which are overflown by both arrivals and departures at much lower altitudes and usually more frequently. In future analyses we will class these suburbs as being '*critically afflicted*' by aircraft noise, however these are not discussed further in the current briefing.

These three categories are important, as the severity of physical and mental effects are quite directly (linearly) linked to the degree of chronic noise pollution, also because these categories provide an indication of how many people in Brisbane are having their lives and wellbeing disrupted by aircraft noise. These three categories will also provide the basis for making preliminary estimates of the health-economic cost burden imposed on Brisbane residents by aircraft noise, to be discussed in a later briefing. These are uncompensated costs, in economic terms 'externalities'.

Figure 2 - Brisbane – Extent and Severity of Aircraft Noise Pollution ~2023.



Source: Based on previous estimates of the population afflicted by aircraft noise pollution; some postcodes include more than one suburb. Legend

slight	moderate	severe	no data
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To make these estimates we used Flight Radar 24 (FR24) to separately track the flight paths of arriving and departing *scheduled* flights across Brisbane in mid-2023. These were divided into two groups: flights arriving or departing from and to the north and west, and flights arriving and departing in a southerly direction. The flightpaths shown on FR24 were used to identify and list the suburbs which were overflowed – this list was compiled over several weeks, so as to ensure that a reliably complete list of suburbs was identified.

Data from the 2021 population census were accessed for all the suburbs on AsA's list, plus suburbs which were observed using FR24 as being overflowed. The list of suburbs was divided into three classes, as described above, for the moderately and severely afflicted suburbs the total number of people afflicted by arrivals and departures estimated separately for each of the two main flight paths to and from the airport (see Annex 3).

To avoid double-counting the population in suburbs overflowed by one major flight path was only counted once, as were those suburbs under both arrivals and departure flight paths. It is obvious suburbs under major arrival and departure flight paths suffer more frequent overflights, especially suburbs closer to the airport. Noise levels in these suburbs experience are higher, as planes are flying at lower altitudes. Interestingly, overall measured noise levels for arriving and departing flights at a given location are quite similar, but have different frequency spectrums.

Brisbane – Estimated and Measured Aircraft Noise Levels

We have illustrated that aircraft noise pollution is pervasive across Brisbane, we now provide some technical data on its severity.

Australia relies on overseas aircraft and engine manufacturers to provide sound level data for approving use of specific types of aircraft in Australia. As far as is known we have no national facilities for validating data provided by manufacturers. Nor does Australia have any laws and regulations limiting the levels of aviation noise pollution allowed, for either urban or rural areas. To 'guesstimate' indoor sound levels caused by aircraft overflights AsA relies on data compiled in the 1980s primarily for use in land use zoning, not human health. This data assumes that structures (homes) built to Australian standard ([AS 2021:2015](#)) reduces (attenuates) external sound levels by about 10 dBA, i.e. 70 dBA external will be reduced to an internal sound level of about 60 dBA. Probably the majority of homes in sub-tropical Brisbane would not meet this standard. As far as can be determined no more recent research has been conducted by relevant agencies or independent researchers in Australia to confirm this assumption. It remains an unscientific 'guesstimate', an example of misgovernance of aviation impacts by successive governments and the industry itself.

Summaries of aviation noise pollution data collected AsA from monitoring stations are posted online and clearly shows that virtually every aircraft arriving or departing Brisbane airport causes (average) sound levels at ground level in the range 60-70 dBA. Given these are 'average' sound levels, rather than instantaneous levels, the actual sound levels are very probably some 20 dBA higher, i.e. *over four times*, greater than publicly reported by AsA (see [Ancich Report 2019](#)).³

Maps of aircraft flight paths ([AsA](#)) and maps from [Open Sky](#) (Figure 1) illustrate that more than a majority (226 of 209) of Brisbane's suburbs are overflowed almost daily, and many dozens of times per day and a smaller, but significant number, also during most nights.

In June 2023 noise level monitors at Bulimba (beside the Brisbane river) and Hamilton (close to the city end of the runways) recorded the greatest number of flights per month and per day, the monitor at New Farm nearly as many. The monitors at Bulimba and New Farm record flights to and from the north and west, those at Tingalpa flights to and from the south and at Hamilton

³ <https://bfpc.org.au/14-noise/>

flights in all directions across the city (see below). These monitors are located relatively close to the airport (7-15 km), whereas the majority of low level arrivals (~2,500-3,000') overfly Brisbane city to or from the outskirts 30-40 km away. Consequently, no noise data is collected for the great majority of the suburbs (and population) being afflicted.

In reality, the number and location of AsA's monitors is wholly insufficient to provide reliable, comprehensive coverage of the major flight paths to and from Brisbane airport, especially for locations more distant from the airport, as illustrated in Figure 2. Hence AsA is *not capable* of providing comprehensive monitoring of the full extent of aviation noise pollution occurring in Brisbane.

This lack of coverage is important, as for Brisbane about half all flights – from north, south and west – overfly residential areas on arrival flight paths at about ~2,500-3,000' for about 25-30 km right across the city. Tens of thousands of people are afflicted by noise from each of these flights many times each day. Data from field studies in 2019 in Sydney showed that flights at this altitude – planes usually 'flying dirty' with flaps extended and landing gear down - generating noise at ground level of 70-80 dBA (Ancich 2019) – well into the 'danger zone' for human health damage.

Table 3 - Brisbane – Number of Flights & Noise Levels - June 2023

From BNE	~15 km	~7 km	~7 km	~9 km	~6 km	~10 km	~15 km	~8 km
dBA	Annerley	Bulimba	Cannon Hill	Carina	Hamilton	New Farm	St. Lucia	Tingalpa
65	329	1121	433	35	137	1417	793	769
70	26	1763	817	174	1,141	1105	90	1821
75	2	107	63	2	1,607	86	10	78
80	2	12	5		107	37	1	14
85			4		7	18		
Total	359	3,003	1,322	211	2,999	2,663	894	2,682
Daily	12	100	44	7	100	89	30	89

Source: AsA, Flights in your area, Brisbane noise monitoring report, 10-11Jun23; <https://aircraftnoise.airservicesaustralia.com/2020/10/29/brisbane-noise-monitoring->. Notes: Figures in red result in health damaging ground-level noise pollution.

Cedar Creek and Balmoral

BAC provided us with recording from two noise monitors. One on the NW outskirts of the city at Cedar Creek 26 km as the crow flies (~40 km flight path, alt. ~110m) distant from the airport, the other located close to the airport at Balmoral (7 km, alt. ~40m).

BAC's EIS did not envisage any flights overflying Cedar Creek or other locations NW of the city, a major oversight that AsA failed to call attention to. In contrast, Balmoral is located in almost a straight line with the new runway and is overflowed at low altitude by hundreds of arriving and departing flights each month.

The data reveal (at least) two important insights. First, despite Cedar Creek being some 40 km distant from the airport, mean aircraft noise levels – both arrivals and departures - are still in excess of 60 dBA and maximum noise levels over 80 dBA on occasions. The topography of Cedar Creek appears to cause reflections and resonances, making noise levels appear louder and more prolonged. Second, these data amply demonstrate that even 40 km from the airport

communities are still being afflicted by noise levels well in excess of those recommended by WHO Europe, UK's CAA and independent experts, and despite aircraft being at 6-11,000' in altitude.

These data strongly support the contention that Brisbane is 'blanketed' by aircraft noise dangerous for residents' health and wellbeing. It is clear that hundreds overflights across Brisbane at 3-4,000', typical for arrivals, are inflicting noise on residents far in excess of maximum levels recommended by WHO Europe or UK CAA (Table 4).

Table 4 - Cedar Creek & Balmoral – Aircraft Noise & Altitudes – 2021-23

Cedar Creek Arrivals				Balmoral Arrivals			
37 flights/day		1,104 flights/mth.		55 Per flights/day		1,648 flights/mth.	
	dBA	Altitude	Correlation		dBA	Altitude	Correlation
Mean	63	6,375	dBA-alt	Mean	80	1,349	alt-dBA
Median	63	6,457	-0.033	Median	78	1,368	-0.047
Max	84			Max	89		
Cedar Creek Departures				Balmoral Departures			
12 flights/day		347 flights/mth.		24 flights/day		713 flights/mth.	
	dBA	Altitude	Correlation		dBA	Altitude	Correlation
Mean	63	10,435	dBA-alt	Mean	77	3,400	alt-dBA
Median	63	10,904	-0.022	Median	78	3,346	-0.047
Max	75			Max	90		

Source: Data from BAC Noise Monitoring Terminals; calculations and analysis by author. Note: Average sound levels recorded by BAC have been adjusted to approximate instantaneous sound levels by multiplying by 1.1. Altitudes in feet. There are insignificant correlations between altitude and noise levels, possibly due to dominance low frequency sounds carrying further.

For Balmoral, in June 2023 there were an average of 79 arrivals and departures per day, 2,361 overflights during the month. Mean arrival and departure noise levels were far in excess of what is considered safe by WHO Europe and other authorities, a majority of overflights close to or exceeding 80 dBA. Despite the median altitude of departing flights being significantly higher than arriving flights, arrivals were substantially noisier than departures, probably due to the fact they were 'flying dirty' with flaps extended and wheels down, resulting in more 'airframe' than engine noise.

For Balmoral BAC's EIS ([Aircraft Noise Assessment](#)) estimated some 5-31 overflights/day in summer daytime over 70 dBA (N70) and 2-12 additional overflights/day on a summer evenings a total 7-43 flights/day, and 0-1 night overflights/day, these would afflict 40-80% of the suburb, contrasting sharply with flight and noise data from BAC's own noise monitoring in June 2023. The BAC monitor recorded an average of 79 flights/day with a median noise level of 78 dBA (arrivals) and 78 dBA/day (departures).⁴

This data clearly illustrates BAC's flight path modelling significantly underestimated both the number and severity of the impact on communities of flights using the new runway. It is difficult to consider errors of this magnitude as not being due to professional incompetence and/or the result of a failure by BAC, and AsA, to conduct a thorough, independent expert peer review of

⁴ These noise levels compare closely with hundreds recorded over 2020-23 in Balmoral by the author using a semi-professional sound meter. However, altitudes for departures at Balmoral are, in general, substantially higher than reported on FR24, where 2,500'-3,000' is usual, with heavy long-haul aircraft (A380/B777) typically at 2,000'-2,500' at this location.

BAC's EIS, especially with regards to such critical issues as anticipated impacts of aircraft noise on Brisbane communities.

In addition, Balmoral and the many suburbs along the major north-westerly departure flight path are experiencing an increasing number of late night (2000-2400 hours) and early morning (0000-0600 hours) overflights by heavy (A380/B777), long-haul departures.

Brussels Airport – Health and Social Costs

The health-economic costs of aviation noise pollution for residents of major urban areas with airports are significant. Our following briefing note will provide a preliminary estimate of health-economic costs ('externalities') of aircraft noise pollution on Brisbane residents. Below, as an example, we have summarised recent results from Brussels, a city of some 1.3 million residents. This is the kind of work we might expect the Australian or Queensland governments to initiate and support, out of a 'duty of care' for Australian cities with major airports and air traffic.

In 2022 a Belgian NGO [Bond Beter Leefmilieu](#)⁵ contracted [ENVISA](#) a French aviation consultancy to prepare estimates of social and health costs to residents of Brussels airport, a major European hub.⁶ They used flight path data collected and analysed by Belgian aviation authorities, and health and other cost data from WHO Europe's database to make estimates.

In Brussels they estimated a total of some ~220,000 suffer annoyance, ~109,000 sleep disturbance, and ~6,800 cardiovascular risks.⁷ For each of these groups they calculated the DALY (Disability Adjusted Life Years), a standard statistical measure used to estimate the costs of annual health effects (EUR/year) in 2022. The total annual cost came to EUR 2.485 bn (annoyance EUR 0.578 bn, sleep disturbance EUR 1.007 bn, cardiovascular EUR 0.900 bn).

This is equivalent to ~EUR 11,295/person/year (~AUD 18,299/person/year) averaged out across the total population. Risk of cardiovascular illness would be more serious for older people, while annoyance was more likely to affect families and younger people, particularly students, and sleep disturbance affect shift workers trying to sleep during daytime, and children. Further, people living closer to the airport or flight paths are more affected than those living further away.

Direct comparisons with Brussels are not possible as there are income and cost-of-living differences between Belgium and Australia. To make an initial comparison we halved per capita cost estimates for Brussels to roughly approximate those for Brisbane residents (i.e. ~AUD 9,000/ person/year). This represents a significant, continuing financial burden, especially for lower income families (who are less likely to fly); for a family of four this is about AUD 36,000/year). These are real, but hidden, costs ('externalities' in economic speak), being shifted to families and the general economy without compensation.

⁵ Union for Better Environment.

⁶ Brussels population was 1.209 million in 2019, about half Brisbane's.

⁷ 'Annoyance' is a poorly defined term too commonly used in regard to aircraft noise, in general it refers to sound levels in excess of 60 dB, which cause resentment, displeasure, discomfort, dissatisfaction or offence" (CAA 2020). However, whether this is a maximum or an average and over what time period (1 second, or one day) is not specified.

Part II – Review of Scientific Literature

Review of Relevant Literature

Research into and understanding the effects of aviation noise pollution (aircraft noise) can be divided into two main phases. The first begins in the early 1970s at about the same time mass air travel commenced its rapid increase with the arrival of wide-bodied jets (e.g. B747) making long-haul international travel cheaper, leading to mass tourism. Not long after this health and environmental professionals started to become alert to the ‘externalities’ of mass aviation, e.g. noise and other forms of pollution – afflicting both people and communities on the ground and local environments.⁸ The first phase of research was ended, arguably, by three publications in 2017-19.⁹

First Phase – What Happens

In 2017 and 2019 ICAO (International Civil Aviation Organisation (a UN special agency) sponsored publication of two white papers reviewing the state of the science for ‘Aviation Noise Impacts’.¹⁰ The first of these two white papers usefully defined noise as ‘unwanted sound’ – a clear definition that had long been missing from the literature. The second paper defined and reviewed evidence on a series of topics: Community Noise Annoyance, Sleep Disturbance, Health Impacts (cardiovascular, hypertension, ischaemic heart disease (IHD) and heart failure, metabolic effects, and mental health); evidence for a causal relationship was strongest for cardiovascular disease. On all these topics aircraft noise was associated with negative health impacts, although the evidence was not definitive the findings were consistent with those for road traffic noise. The paper also reviewed evidence on effects on children’s learning, via effects on cognitive development. In summary, their conclusion was:

- There is robust evidence for an effect of aircraft noise exposure on children’s cognitive skills such as reading and memory, as well as on standardized academic test scores. ([Sparrow et al \(2019\)](#), p. 53)

The 2019 paper also made a brief survey of approaches to assessing the economic and financial costs of aircraft noise, as these are important in policy formulation and decision making. Later in this briefing we will discuss we will present a preliminary estimate of the Disability Adjusted Life Years (DALYs) approach pioneered by WHO for cardiovascular disease, sleep disturbance, tinnitus and annoyance.

The third of these papers was publication in 2018 of the “[Environmental Noise Guidelines for the European Region](#)” by UN World Health Organisation (WHO) Europe, which included a section on aviation noise.¹¹ This publication critically reviewed peer-reviewed research up to that time and made several recommendations, which have formed the basis for EU policies on managing aircraft noise. The two main recommendations were:

⁸ The word ‘afflicting’ is used rather than the softer term ‘affecting’ as it has become increasingly evident that millions of people suffer physical and mental harm and loss of amenity due to aviation-related pollution.

⁹ Where available we have used systematic reviews of particular aspects of the effects of aircraft noise on adults and children, as these usually provide an assessment of the quality of evidence in the papers reviewed.

¹⁰ Basner, M. et al (2017) "Aviation Noise Impacts: State of the Science" *Noise Health*. 2017 Mar-Apr; 19(87): 41–50. doi: 10.4103/nah.NAH_104_16. Sparrow, W. et al (2019) "State of the Science 2019: Aviation Noise Impacts" <https://www.icao.int/environmental-rotection/Documents/ScientificUnderstanding/EnvReport2019-WhitePaper-Noise.pdf>

¹¹ WHO Europe (2018) "[Environmental Noise Guidelines for the European Region](#)."

- For average noise exposure, the GDG¹² strongly recommends reducing noise levels produced by aircraft below 45 dB Lden, as aircraft noise above this level is associated with adverse health effects.
- For night noise exposure, the GDG strongly recommends reducing noise levels produced by aircraft during night time below 40 dB Lnight, as aircraft noise above this level is associated with adverse effects on sleep. (WHO 2018 p.61)

In the Australian context it's important to note WHO's '*strong recommendation*' in 2018 was for daytime noise exposure to be reduced to below 45 dBA and night time levels to below 40 dBA. Aircraft noise exposure across most of Brisbane, even levels measured by AsA and BAC, are consistently well above 60 dBA, day and night.

These three papers identify and review hundreds of peer-reviewed research reports published since about 1970. The WHO Guidelines, for example, cites some 60 select references, plus a dozen systematic reviews. The 2017 ICAO white paper cites 70 sources, and 2019 ICAO white paper devotes a whole annex to listing 198 [references](#). (See the footnotes and references for links to these papers.) See Annex 4 for a summary of effects.

For the first phase epidemiological studies were used to illustrate and evidence the impacts of aircraft noise on a range of key health factors. Although links between aircraft (and other) noise and these ailments became increasingly clear over time the mechanisms by which this occurred was not well understood. Further work since then has identified the physiological and biochemical pathways activated by aircraft noise. By about 2020 there could be no further doubt about aircraft noise being the cause of a range of serious ailments. That is, 'what happens' had been definitively identified, but not 'the how'. This is the second phase of research, one still underway.

Second Phase – How it Happens

The work done in this second phase is summarised below. One of the most recent results is from a Swiss study, and three from complementary German work. For the Swiss researchers this was possible, in part, because of comprehensive national health records maintained by Switzerland, facilitating elimination of confounding factors from the analysis, combined with comprehensive long-term noise data. For their German colleagues, the authors had been working for some years to elucidate body and brain causative mechanisms and the resulting effects.

Until a few years ago the harmful effects of noise, particularly aircraft noise, were known mainly through epidemiological studies of affected populations, the complex pathways behind the effects was still being disentangled. Some recent advances in medical science has now made it possible. Neurological and biochemical pathways in the human body and brain are now better understood, removing any lasting doubts of causal linkages between (aircraft) noise and: heart attack, stroke, high blood pressure, dementia and cognitive decline and other harmful effects. The diagrams below, taken from recent studies, illustrate, better than words, these causal pathways in the body and brain.

In late 2021 the results of a 15-year long study of health effects on some 1.4 million Swiss residents of road, rail and aircraft noise was published.¹³ The focus of the study was on associations between measured aircraft noise levels and myocardial infarction deaths ('heart attacks'), ischemic stroke mortality and blood pressure. In brief, the more (aircraft) noise the more deaths from heart attacks and strokes. With harmful effects starting below 40 dB L_{den} and

¹² GDG = Guideline Development Group.

¹³ Vienneau, D. et al (2021) "Transportation noise exposure and cardiovascular mortality: 15-years of follow-up in a nationwide prospective cohort in Switzerland."
<https://www.sciencedirect.com/science/article/pii/S0160412021005997?via%3Dihub>

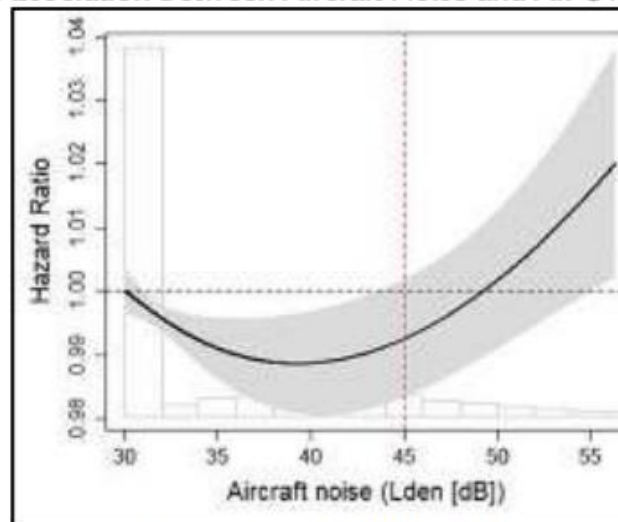
increasing approximately linearly, higher levels of intermittency – e.g. aircraft noise - was associated with increased harmful effects.

Their conclusions were that:

Independent of air pollution, [aircraft] noise exposure is associated with all and cause-specific CVD mortality, with effects starting below current [WHO] guideline limits.

For aircraft noise the increase in the hazard ratio, i.e. the likelihood of occurrence, for cardiovascular disease is illustrated in the diagram below. The vertical red dashed line is WHO's recommended day-night (L_{den}) maximum noise level of 45 dBA. Values above 1.0 indicate an increased hazard ratio of all types of CVD caused by aircraft noise.

Association Between Aircraft Noise and All CVD



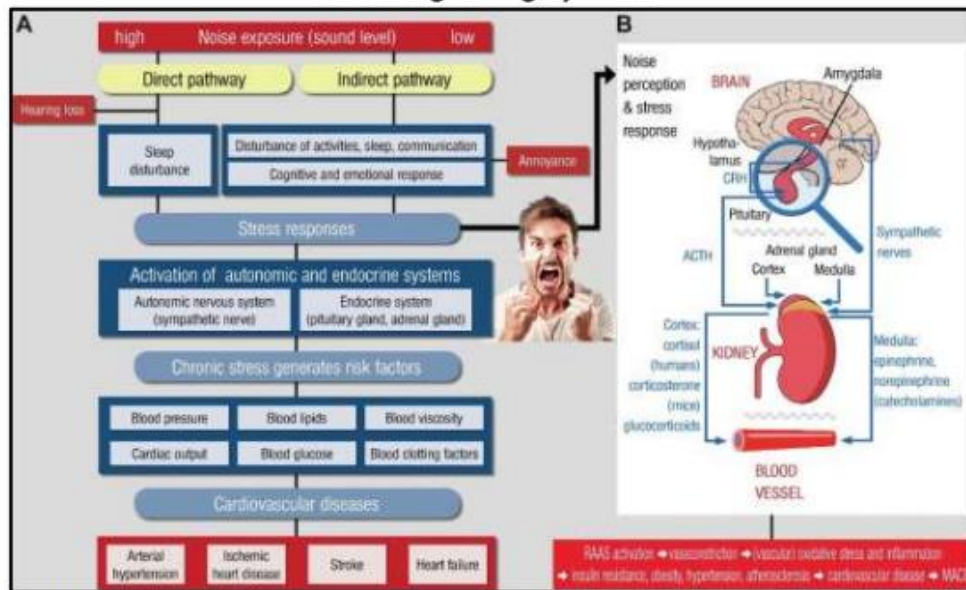
Source: Vienneau et al 2021, Fig. 1

The following diagram provides additional detail on responses to biochemical and neuronal pathways responding to high and low level noise exposure; high level noise is >100 dBA which damages hearing, while low level noise is 50-60.

Münzel (2023) and his colleagues uncovered additional chains of biochemical and hormonal causation underlying ailments related to aircraft noise, and noise generally. These are 'whole body' responses to the stress caused by noise. Adding mental health effects, such as depression and anxiety, to the list of ailments. In brief aircraft noise:

... sleep, and communication, which in turn will result in emotional stress responses such as annoyance or even anger characterized by increased levels of cortisone or activation of the sympathetic nervous system [see diagram below]. Chronic stress response will promote the formation of cardiovascular risk factors such as hypertension, increased glucose and cholesterol levels ... (Münzel et al, 2023)

Stress Signalling by Noise



Notes: Stress signalling by noise. (A) Noise-stress concept and the adverse health consequences in humans. Noise reaction model for the direct (auditory) and indirect (nonauditory) effects of noise exposure. (B) Neurohormonal activation induced by noise.

Source: Münzel et al (2023) "Too Loud to Handle? Transportation Noise and Cardiovascular Disease" Canadian Journal of Cardiology - (2023) 1-15, <https://doi.org/10.1016/j.cjca.2023.02.018>

The diagram below provides a schematic overview of hormonal and cerebral responses to noise – the activation pathways that initiate the brain’s and then the body’s responses. It is clear many aspects of human coordination, cognition and behaviour can be and are affected by noise.

Brain-body Interaction in Response to Noise

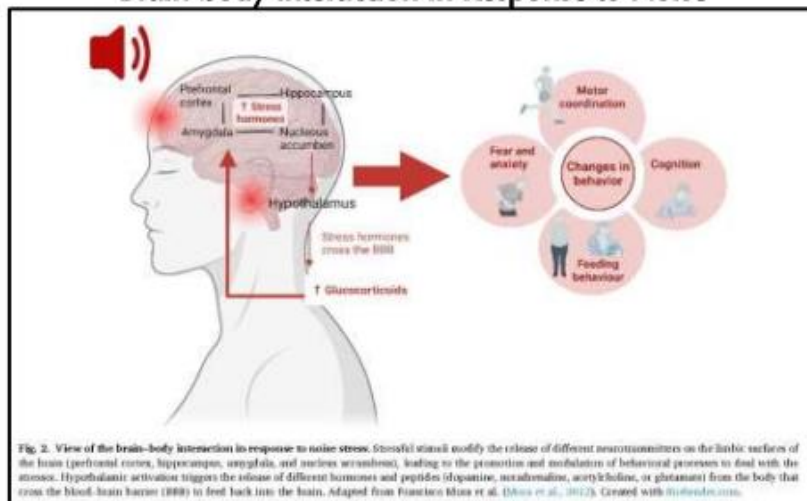
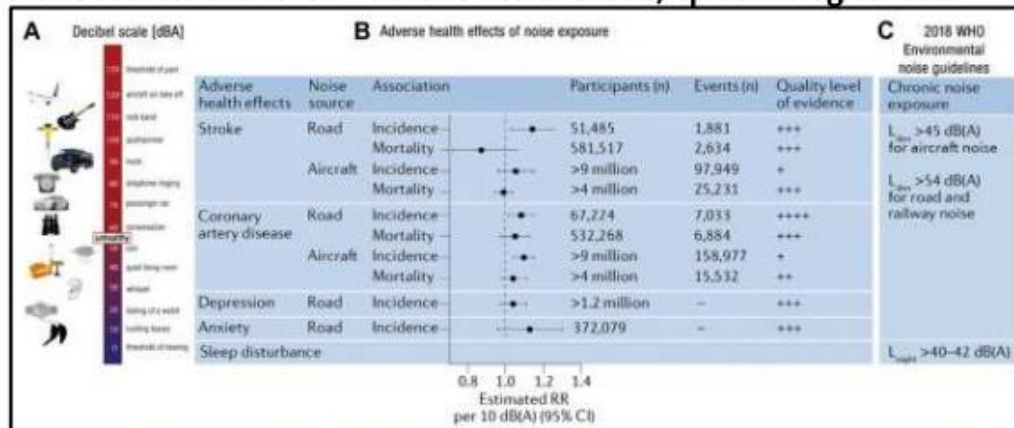


Fig. 2. View of the brain-body interaction in response to noise stress. Stressful stimuli modify the release of different neurotransmitters on the limbic surfaces of the brain (prefrontal cortex, hippocampus, amygdala, and nucleus accumbens), leading to the generation and modulation of behavioural processes to deal with the stimulus. Hypothalamic activation triggers the release of different hormones and peptides (dopamine, neuropeptide, oxytocin, or ghrelin) from the body that cross the blood-brain barrier (BBB) to feed back into the brain. Adapted from Francisco Diaz et al. (2022). Created with BioRender.com.

Source: Hahad et al (2022) Cerebral consequences of environmental noise exposure. Environment International 165 (2022) <https://doi.org/10.1016/j.envint.2022.107306>

Based on epidemiological studies the following diagram and table provides a summary of the health risks associated with different noise levels from several sources. Note that the WHO recommendations are, implicitly, for average chronic aircraft sound pressure (noise) levels to be kept below 45 dBA, significantly lower than for road and railway noise. This is a clear indication of the severity of the effects of chronic aircraft noise – as experienced by Brisbane residents - as compared to other transport sources.

Noise sources and levels - adverse health effects, epidemiological data



Source: Münzel et al (2023). Notes: (A) Sound pressure levels concerning various noise sources. (B) The incidence of stroke, coronary artery disease, depression, and anxiety increases in response to chronic exposure to road or aircraft noise (expressed as relative risk [RR] estimates for every 10 dBA increase in exposure). Level of evidence: + very low; ++ low; +++ moderate; ++++ high. (C) According to the 2018 WHO environmental noise guidelines for the European region, the non-auditory adverse health effects of noise, such as psychological, cardiovascular, and cerebrovascular diseases, are triggered by chronic noise exposure to day-evening-night noise level (L_{den}) of 45-54 dB(A). Adverse effects of noise on sleep are observed in response to A-weighted equivalent noise level for the night period (L_{night}) of 40-42 dB(A).

Vienneau et al (op cit) independently confirmed that noise exposure well below WHO’s recommendation of 45 L_{den} – a day-night average - is associated with cardiovascular disease-related (CVD) causes of death.

Independent of air pollution, road traffic and railway noise exposure were associated with the majority of CVD causes of death, often with risk increases starting well below the WHO guideline limits. (Vienneau et al, 2022)

This clearly indicates the ‘rough and ready’ Australian ‘standard’ of 60 dBA interior sound level for aircraft noise is excessive, dangerous to health and needs to be revised, based of a wealth of scientific research.

One of the most concerning recent findings is that exposure of CVD patients to aircraft noise >50dBA in the 2 hours preceding was significantly associated with their death.

For night-time deaths, exposure levels 2 h preceding death were significantly associated with mortality for all causes of CVD [OR = 1.44 (1.03–2.04) for the highest exposure group ($L_{Aeq} > 50$ dB vs. <20 dB)]. Most consistent associations were observed for ischaemic heart diseases, myocardial infarction, heart failure, and arrhythmia. ... Our findings suggest that night-time aircraft noise can trigger acute cardiovascular mortality. The association was similar to that previously observed for long-term aircraft noise exposure. (Saucy et al 2021)

This suggests that even within the protected environment of a hospital aircraft noise >50 dBA has the potential to cause mortal harm to cardiac patients. In the Brisbane context this may be a matter of real concern, given that night-time external aircraft noise often exceeds 70 dBA (e.g.

late night A380 and B777 flights) overflying major hospitals where internal noise may well exceed 50 dBA.

Aircraft Noise and Children

Many researchers have emphasised the need for gaining a better understanding of the effects of aircraft noise pollution on children, especially how it affects cognitive development and learning. The reasons for this are simple, children have their lives before them and delays in development or in learning are likely to affect their whole life. Children are also known to be more easily affected, as their bodies and nervous systems are still in the process of rapid development until their late teenage years. Noise that disrupts children's sleep is known to be particularly harmful.

"Arguably, the effect on student learning in schools is the worst harm. This is because any lack of attainment is detrimental to health and wellbeing for the rest of the students' lives. Addressing noise is particularly important for equality, because schools in disadvantaged areas are usually on noisier sites." Prof. Trevor Cox, at the University of Salford in England

Work on this issue has been going on for some fifty years. The issue is considered important enough that scholars have returned to reanalyse data collected nearly twenty years previously using new techniques. Possibly the largest study collected data from schools adjacent to three airports: Heathrow (UK), Schiphol (Netherlands), and Barajas (Spain) in 2002-03 as part of the RANCH study.¹⁴ A recent re-analysis showed that:¹⁵

"... a 1dB increase in aircraft noise exposure at school was associated with a -0.007 (-0.012 to -0.001) decrease in reading score and a 4% increase in odds of scoring well below or below average on the reading test. .. [it] also found that a 1dB increase in aircraft noise exposure at school was associated with a 0.017 (0.007 to 0.028) increase in hyperactivity score."

A meta-analysis of these three studies confirms existing evidence for effects of aircraft noise exposure on:

"... children's reading comprehension, providing a pooled estimate and exposure-effect relationship, as well as additional estimates and relationships for effects on scoring 'well below or below average' on the reading test offering flexibility for taking reading comprehension into account in HIA and monetisation methodologies in a wide-range of contexts." (ibid)

The relationship between aircraft noise and reading comprehension is linear (after adjusting for many factors), hence reducing noise exposure at any level should lead to improvements in reading comprehension. In practical terms:

"... reading falls below average (a Z-score of 0) at exposures greater than 55dBA $LA_{eq,16h}$ " (ibid)

In the Australian context, given the aviation industry's unfounded assertion that 70 dBA external aircraft noise will be attenuated to about a 60 dBA internal, strongly suggests much greater attention needs to be directed to reducing external noise levels. This would ensure internal aircraft (and other) noise levels remain below about 50 dBA, so as to eliminate impacts on children's reading skills.

¹⁴ RANCH = Road traffic and aircraft noise exposure and children's cognition and health.

¹⁵ Clark et al (2021) "A meta-analysis of the association of aircraft noise at school on children's reading comprehension and psychological health for use in Health Impact Assessment." *Journal of Environmental Psychology* 76:101646. DOI: 10.1016/j.jenvp.2021.101646

In addition to its effects on reading and other skills development aircraft noise also has a psychological effect on children. A study near the recently relocated airport at Munich, Germany airport showed, in summary:

significant decrease of total quality of life 18 month after aircraft noise exposure as well as a motivational deficits operationalized by fewer attempts to solve insoluble puzzles in the new airport area. Parallel shifts in children's attributions for failure were also noted. At the old airport parallel impairments were present before the airport relocation but subsided there after. These findings are in accord with reports of impaired psychological health after noise exposure and indicate the relevance of monitoring psychological parameters as a function of environmental stressors among children. (Hygge, S. et al (1999))¹⁶

Conclusions

If you live in a Brisbane community that is frequently overflowed by aircraft at a low level (i.e. below 5,000 feet, ~1,500 metres), especially below 3,000' (~1,000 m), then you are almost certainly being frequently exposed to excessive aircraft noise. This is especially the case if your community is located within 10-15 km of a major airport, in Brisbane, Sydney or Melbourne.

We have concluded this analysis with a brief discussion of the effects of excessive aircraft noise on children's learning progress, because, in Brisbane at least, many schools are frequently overflowed by aircraft below 3,000' arriving and departing Brisbane airport. The negative effects on children's development, at school and at home, is one of the most distressing effects of the current flight paths across Brisbane city.

Recent research has also confirmed that particulate pollution (PM_{2.5}) from burnt jet fuel is a health hazard for people working at airports and living in the vicinity and under flight paths. In the north-western rural part of Brisbane, when residents rely on collecting rainwater, particulate pollution from leaded turboprop fuel is also a problem. These issues are not discussed further, as no reliable data has been collected for northwest Brisbane. However, many studies clearly indicate ultra-fine particulates – from jets and leaded fuel - are a serious environmental health hazards.¹⁷

The effects of aircraft noise are recognised by WHO, CAA and other major public organisations and researchers as a *public health issue*, one with very real health, economic and social costs for families and society. It is an issue that, to its shame, is being studiously ignored by Australian federal and state governments – a continuing failure of Duty of Care.

Estimating health costs is a complex process requiring knowing which locations (suburbs) are overflowed at what altitude and frequency, up-to-date census information on each location, and the likelihood of aircraft noise causing specific ailments. Estimating economic costs/losses for industry and service sectors requires similar information, but orientated towards the likelihoods, for example, of worker's being sleep deprived or shift workers not being able to get a good

¹⁶ Hygge, S. et al (1999) "The psychological cost of aircraft noise for children." *Zentralblatt für Hygiene und Umweltmedizin* · September 1999. DOI: 10.1121/1.425878, PubMed

¹⁷ Mazaheri, M et al (2011) "An inventory of particle and gaseous emissions from large aircraft thrust engine operations at an airport." *Atmospheric Environment* 45(20):3500-3507, DOI: 10.1016/j.atmosenv.2010.12.012.

Masiol & Harrison (2014) "Aircraft engine exhaust emissions and other airport-related contributions to ambient air pollution - A review." *Atmos Environ* (1994). 2014 Oct; 95: 409–455. doi: 10.1016/j.atmosenv.2014.05.070.

Owen, B et al (2022) "Review: Particulate Matter Emissions from Aircraft." *Atmosphere* 2022, 13(8), 1230; <https://doi.org/10.3390/atmos13081230>.

nights sleep, resulting in reduced productivity, for property owners, reduced land values, and for children and students disruption of cognitive development and learning progress.

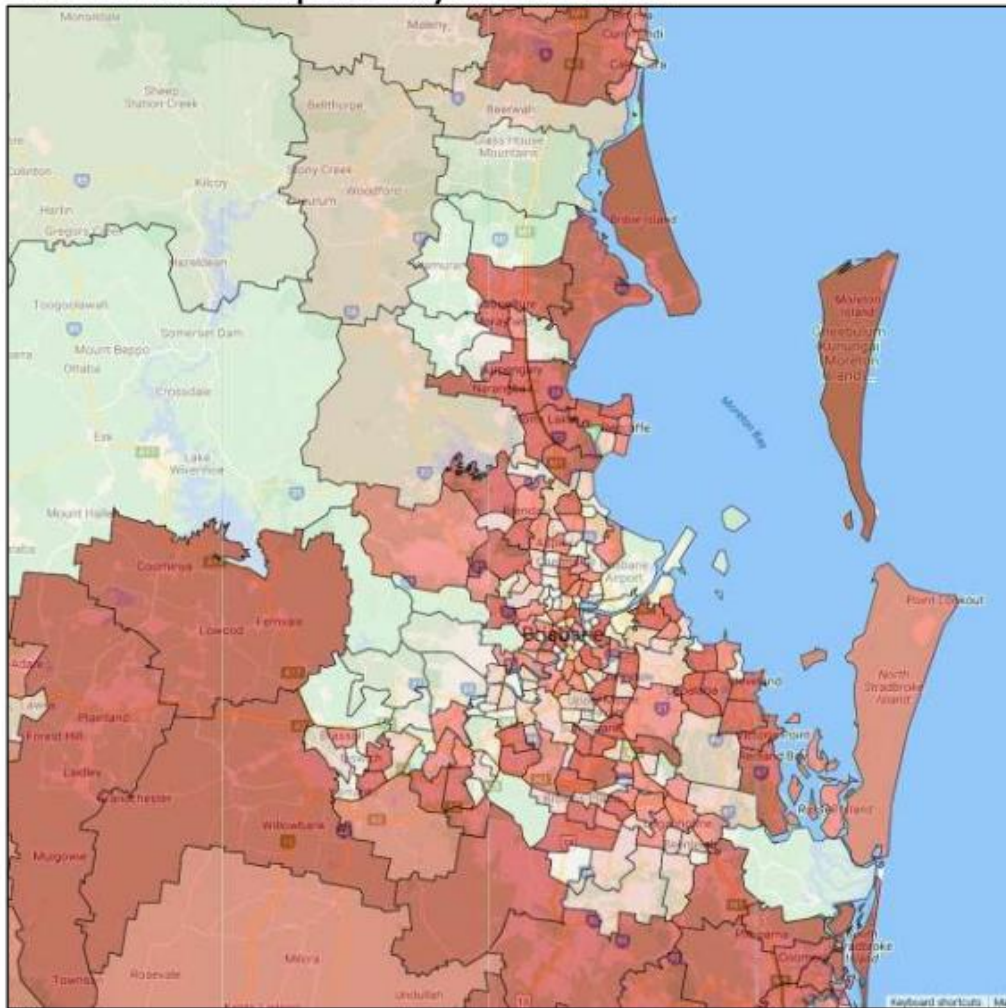
Sean Foley: BSc (Hons) PhD FRGS – Scientist, August 2023

Annexes

Greater Brisbane – Thematic Maps

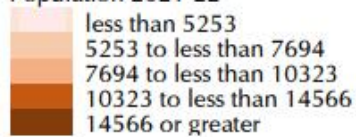
Annex 1

Greater Brisbane – Population by Suburb 2021-22



Source: ABS, Regional population, various editions (<https://www.qgso.qld.gov.au/statistics>)

Population 2021-22



Annex 2

Greater Brisbane – Population Density by Suburb 2021-22



Source: [ABS Story Maps, Regional Population 2021-22: Population Grid](#)

Annex 3

Brisbane - Assessed Aircraft Noise Severity by Suburbs

Suburb	Slight	Suburb	Slight	Suburb	Moderate	Suburb	Moderate	Suburb	Severe
Acacia Ridge	1	Lota	1	Alexandra Hills	2	Samford	2	Ascot	3
Aderley	1	Lutwyche	1	Annerley	2	Samford Village	2	Balmoral	
Albany Creek	1	Macgregor	1	Aspley	2	Samsonvale	2	Brisbane City	3
Armstrong Creek	1	Mackenzie	1	Birkdale	2	Sandgate	2	Bulimba	3
Banksia Beach	1	Macleay Island	1	Bracken Ridge	2	Slacks Creek	2	Cedar Creek	3
Banyo	1	Manly	1	Camp Hill	2	Springfield Lakes	2	Chapel Hill	3
Bellbowrie	1	McDowall	1	Camp Mountain	2	Stafford Heights	2	Chermside West	3
Bongaree	1	Milton	1	Cannon Hill	2	Sunnybank Hills	2	Coorparoo	3
Boondall	1	Moggill	1	Carina	2	Taringa	2	East Brisbane	3
Bowen Hills	1	Mount Cotton	1	Carindale	2	Thorneside	2	Hamilton	3
Bridgeman Downs	1	Mount Gravatt	1	Carseldine	2	Tingalpa	2	Hawthorne	3
Buccan	1	Mount Gravatt East	1	Chandler	2	Underwood	2	Hendra	3
Bunya	1	Mount Mee	1	Deception Bay	2	Upper Kedron	2	Inala	3
Burbank	1	Mount Ommaney	1	Dunwich	2	Wakerley	2	Murarie	3
Carbrook	1	Mount Samson	1	Fairfield	2	Woodridge	2	Norman Park	3
Clontarf Beach	1	Nathan	1	Fitzgibbon	2	Woody Point	2	Pullenvale	3
Closeburn	1	New Beith	1	Forest Lake	2	Woolloongabba	2	Rochedale	3
Coochiemudlo Is.	1	Nudgee Beach	1	Fortitude Valley	2	Woongoolba	2	Samford Valley	3
Cornubia	1	Ocean View	1	Greenslopes	2	Yeerongpilly	2	Stones Corner	3
Delaneys Creek	1	Ormeau	1	Hemmant	2	Yeronga	2	Upp. Brookfield	3
Draper	1	Pallara	1	Hendra	2			Teneriffe	3
Dutton Park	1	Park Ridge	1	Highgate Hill	2			Toowong	3
Ellen Grove	1	Parkinson	1	Indooroopilly	2				
Ferry Grove	1	Pinkenba	1	Jimboomba	2				
Gumdale	1	Point Lookout	1	Kangaroo Point	2				
Heathwood	1	Ransome	1	Lawnton	2				
Heritage Park	1	Redland Bay	1	Logan Central	2				
Highvale	1	Salisbury	1	Mango Hill	2				
Hillcrest	1	Sandstone Point	1	Marsden	2				

Suburb	Slight	Suburb	Slight	Suburb	Moderate	Suburb	Moderate	Suburb	Severe
Joyner	1	Seven Hills	1	Moorooka	2				
Kalinga	1	Shorncliffe	1	Morningside	2				
Karana Downs	1	Stretton	1	Mount Coot-Tha	2				
Kenmore Hills	1	Thornlands	1	New Farm	2				
Kippa Ring	1	Virginia	1	North Lakes	2				
Kobble Creek	1	Waterford	1	Rocklea	2				
Laceys Creek	1	Wights Mountain	1	Russell Island	2				
Logan Reserve	1	Yugar	1						

Annex 4

Aviation noise and health

The effects of aviation noise

Aviation noise can affect human health and wellbeing in a variety of ways. Here are some of the most common adverse health effects associated with aviation noise:

Annoyance

The most widespread and well documented subjective response to noise is annoyance; which can be defined as a feeling of resentment, displeasure, discomfort, dissatisfaction or offence which occurs when noise interferes with thoughts, feelings or activities. The annoyance of populations exposed to environmental noise varies not only with the sound itself (such as how loud it is, or its pitch), but also with social, psychological or economic factors.

Cognitive impairment

There has been considerable research into the effect of aircraft noise on cognitive performance in school children, due to the interruptive nature of high levels of aircraft noise. Research has suggested effects on reading comprehension and memory. Cognitive performance affects attention, perception, mood, learning and memory.

Sleep disturbance

Aircraft noise is intermittent in nature and exposure to it during the night may result in sleep disturbance. Noise-induced sleep disturbance refers to awakenings, changes to sleep structure such as changes to sleep stages, arousals in heart rate, and body movements. People can be aware of such disturbance, such as when they remember being awoken by noise, or the disturbance can go unnoticed at the time but may result in next-day fatigue.

Cardiovascular disease

Aircraft noise at high levels can be considered a stressor on the body, and research has found an association between high levels of aircraft noise and an increased risk of developing Cardiovascular disease (CVD). It is thought that this occurs due to the way such stressors interact with the body, and the fact that the cardiovascular response to noise does not decrease, even though the individual may no longer consciously notice or react to the noise. Cardiovascular disease includes all the diseases of the heart and circulation including coronary heart disease, angina, heart attack, congenital heart disease and stroke.

Source: [UK Civil Aviation Authority](#)

Further sources of information on aviation noise and human health

Reports on relationship between aviation noise and human health and wellbeing cover:

- [Sleep Disturbance](#)
- [Annoyance](#)
- [Cardiovascular disease and daytime health effects](#)
- [Children's cognitive performance](#)
- [Other relevant reports to noise and health](#)
- [Aircraft noise and biodiversity](#)
- [Updates on recent work and finding](#)

(Source: [UK CAA](#))

Appendix 3.

BACACG

Submission

5th September 2023

Medical Harm

- Nothing should justify the mandatory imposition of a known medical harm upon a population, small or large. Especially if it is ongoing and preventable. It is morally wrong to impose a known harm on any citizen, not for the reason of preventing harm to others, but merely for the cost-savings and convenience of private companies and some night time travellers. We look back on such occurrences in history with abhorrence ie the recent ROBO Debt inquiry.
- The inevitability of flight noise from the aviation industry seems to be widely accepted as necessary by many of those in positions of influence, and a 'problem to be managed by changing public perceptions, rather than fixing the problem. There is little government oversight for instance an aircraft can circle your house all day at low level without breaking one law. Or airliners can flood your environment with continuous noise while politicians huddle in a corner representing their backers not their electors

Noise Sharing

- Noise sharing is nothing other than legalised harm by attempting to spread a known hazard on to more citizens without proper research into its economic, medical and social effects, in order to avoid mitigating or preventing the harm at source.
- Of course from mistaken to scandalous. The real scandal is that the industry's noise pollution is even encouraged by protective regulation and taxpayer subsidies to encourage more growth (and noise).
- The consultation process regarding flight noise 'management' is ongoing (endless), confusing, fragmented (no clear picture of the overall plan or goal), divisive to the community and aimed at getting a nominal mandate from citizens to continue the misleading but profitable (for industry) strategy of avoiding the real issues above and socialising the considerable costs for which they are not currently liable.

Noise Measurement

- Unaccountable technocrats making the decisions about aviation issues are focused on operational convenience and narrowly defined aircraft safety, and their mandate does not take much account of community issues. Their approach to noise management is moreover based on an almost total lack of adequate measurement of actual noise profiles on the ground, and research into its effects in Australia. As an example a typical passenger aircraft at 6000 ft on climb power cuts a swath 10 kilometres wide where everything in that swath is exposed to 50Db or higher. To represent noise as a single line on a map is arrant nonsense.

Responsibilities

- To add insult to injury the organisation allegedly 'managing' aircraft noise (and community perceptions of same) is paid by the industry – the more flights it manages, the more income it receives!

BACACG

Submission

5th September 2023

- The history of forcing on the community the sorts of infrastructure and operational developments and regulatory procedures which allow these wrongs to occur is exemplified by lying, incompetence, waste of public monies, misleading claims, and broken promises, for which no one is apparently accountable. The tradition continues to this day.
- Governments and politicians appear to be more beholden to industry influencers (who seduce them with benefits, fake stats and positive PR headlines) than they are to the community who they allegedly represent.

Accounting Methodology

- The AirServices politically biased accounting methodology is wrong and the thinking behind being able to treat citizens merely as noise complaint statistics to be 'managed' is deeply flawed, aside from being unethical. The aviation industry has bought itself special and unwarranted privilege, and citizens pay the price.

And The Responsibility Wholly Lies With.....

- We have significant evidence of bad educational and health outcomes due to aircraft noise
- As for the myth of 'good for the economy. A UK study has shown there is a net outflow of wealth to the UK due to air travel
- As mentioned Our Research shows significant health downsides - our calculations are in the billions of dollars that the aviation industry is pushing onto the public. We have police visiting homes of people at the end of their tether. We have guards at Air Services drop in sessions.

Catherine King -You come to Brisbane to consult with backers and apparatchiks but refuse to meet or acknowledge the tens of thousands you are damaging by your policy of deliberate and ignored harm. We are looking directly at you - this is all on your head. We are past the point of you sending up minions to take notes

Appendix 4.

BACACG

Letters (3)

5th September 2023

=====

We are woken almost every night by this flight. It comes just as we are settling into deep sleep. It is a regular repeat offender for a large number of residents of Brisbane, waking children and adults alike, part of the start of a night bombardment that is destroying our health. This flight was barely 5000 above our home, with the booming waves of sound echoing off the valleys, amplifying the noise.

These are the intermittent flights: one or two an hour, through the night, with noise up to 80dB by our readings even 30km from the airport, and 70dB on your meter lower in the valley. They guarantee that residents under the night flightpaths cannot live a healthy life: deprived of sleep, we are struggling to work, let alone to live well. This is criminal activity, breaching workplace health and safety and duty of care for residents affected by the operation of BAC and Emirates Airlines. These repeated, intermittent, loud, sleep-disrupting flights were not once accurately described in the EIS for the new runway development and are still not captured in ASA's current proposed changes to flightpaths. ASA also have a responsibility to residents, not just to the airports and airlines that fund you. This flight in particular should not be allowed to fly at night over homes. Until such time as you can guarantee to put these flights over water there is only one solution: curfew, now.

- =====
- Apology for lengthy post. Just sharing my experience. We been living in same house since 2005 in Seven Hills. PRE NPR had zero issues with noise. Never had to lodge single complain. House not even on NPR flight track or legacy track Per flight path tool. But we get following flights almost every night and day time movement as well. Lack of sleep and constant noise is taking toll on our mental health and livelihood. It is challenging to focus on job and perform day to day Activities. We can live with this occasionally but on regular basis it is hard to even comprehend living this way. This shows magnitude of damage being done by ASA/BAC and airlines On our lives. Moving house means losing money as well right now.
 - Doha 11.40pm;
 - Singapore 12.10am; Hong Kong 1.37am;
 - Vietnam around 2am;
 - Rockhampton 2.50am;
 - Dubai 3am;
 - Cairns 4.10am;
 - TSV 4.35am;
 - TSV 4.55am;
 - From 5am -6am some other north QLD.
 - Not to forget during day time constant noise from NPR and movement of planes over the house for southern and in afternoon some northern as well. ASA think that is not enough so in new proposed option we will have non stop departure and arrivals for northern and southern in segregated mode. I am sure that will become default mode. cause it will provide BAC to fill in additional track with planes and ASA will have to have less staffs and less people complains as noise will be shifted on different communities who already got it worse. I am aware there are so many people in community who are in similar situations. CAP and Curfew can solve the lots of this issues. economy. Profit before people. I am hopeful time will come for these corporations to take responsibility for communities who they keep ignoring.
- =====

-
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- “The new flight paths and expanded areas of noise impact known as 'noise sharing' here proposed as 'options' do not address the fundamental issues with the design, implementation and operation of the expanded Brisbane Airport and new runway, nor address the impacts on health and loss of reasonable enjoyment of our homes that BAC and the airlines are imposing on those living under the flight paths.
 - This 'consultation' process and proposed 'options' asks unqualified residents to choose between a rock and a hard place based on poor information and without advocacy on their behalf. ASA 'single event, maximum noise level (LAMax) contour' modelling in the supporting documents claims to be "based on the loudest international jet". ASA's own noise meter readings show that residents regularly (daily) suffer events over 70dB at night in areas such as Taringa and Brookfield, well outside ASA's maximum noise contour models, in breach of WHO standards, and a times and severity that cause severe cardio-vascular disease as documented at Heathrow by Itzkowitz et al 2023 (<https://doi.org/10.1016/j.envint.2023.108016>). This process of flight path design and implementation should be conducted with qualified, official legal (judicial) and technical oversight with mandate to advocate for residents. ASA do not have this authority, qualification or role and do not advocate for residents. There is no environmental impact assessment on the impact of these new flight paths. This survey is thus invalid and cannot be used to justify this inadequate response to the faults inherent in the expanded Brisbane airport design and operations. These options offer only solutions that do not interfere with airport business without accounting for the externalised costs and health impacts imposed on residents as a direct result of the noise pollution generated by Brisbane Airport Corporation and airline businesses. There has not been any clarification or adjustment to building codes or compensation for work required to modify homes for the level of noise impact experienced by residents. Compensation for moving home, for rectification of buildings under flight paths to suit actual noise levels, and compensation for loss of amenity and reasonable enjoyment of our homes must be addressed before imposing new flight paths and the proposed expanded areas of noise impact known as 'noise sharing'. We must have a curfew, caps on flights until the impacts of the expanded airport and operations have been fully validated, documented, and reviewed, and until adequate corrections to design and operation of the expanded airport with qualified advocacy for residents, have been developed, with compensation for those affected.”
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To Sean Foley (1/9/2023)**Information provided by Eve Newsome (1/9/23) on behalf of the Southern Moreton Bay Island Community Action Group**

The SMBI Community Action group is made up of representatives of and residents from Macleay Island; Russell island; Lamb Island; Karragarra Island

BACK GROUND:

- Macleay island resident Eve Newsome attended the Asa community consultation Brisbane Noise meeting in Redland Bay on 2/5/2023 and witnessed an Asa consultant explaining to the public that one of the two proposed southern departure flight paths over the SMBI (Alternative night-time over water departure paths – south and west) was nicknamed the ‘green’ route because it travelled over uninhabited land. She corrected his mistake letting him know that 10,000 people lived on the SMBI. She also asked why Asa had not organized a community consultation meeting on SMBI and was told that the islanders could attend the one at Amity Point. Eve had to point out that to get to Amity Point the SMBI residents would have to drive/walk to the ferry terminal on their island, then catch a ferry to the mainland and then catch a bus then catch another ferry and then walk to the venue on Stradbroke Island. This could take around 2 hours or more. She explained that for her to get to the Redland Bay meeting on that day she had had to drive to the ferry terminal on Macleay Island, then walk, then catch a ferry to the mainland and then walk from the ferry terminal to the Redland Community hall. The Asa consultants seemed surprised as if they did not know about the logistics involved for SMBI residents.
- An all-community meeting was called for 15/5/2023 to let all SMBI residents know what Asa had said about the islands being uninhabited and also to explain the proposed Asa Phase 1 options that would affect the islands. These were Option 4 (affecting MI/SMBI) and Option 5 (affecting Karra/Lamb/Russell) Alternative night-time over water departure paths - south and west.
- At the community meeting (May 15, 2023) on Macleay Island there was a lot of resident concern about misinformation and the fact that Asa had not engaged in any way with the SMBI residents about the Phase 1 proposals. Many people felt that they were being thrown under the bus by being designated as an uninhabited area and wanted something to be done about it. They were very concerned about the looming Asa website feedback deadline of May 28 and how most islanders did not have any prior knowledge of what was being proposed for their airspace because of the lack of Asa engagement. Concerns were raised in relation to the SMBI being a National Marine Park and also a Ramsar wetland and the huge numbers of migratory birds in the region that could be affected by flights. Other concerns were raised such as noise pollution for such a quiet, peaceful area; soot pollution and its health effects such as on rainwater (which a lot of people drink on the islands) and the acidification of the waterways more generally which would affect wildlife.

- Residents were also concerned about the increases in the number of planes on the current flight paths with comments that they had escalated over the last 6 months or so. They were also concerned about their current low heights as they came over or near the SMBI. Residents were advised to let Asa know their concerns through the feedback and complaints options on their website.
- Since that time, Eve has attended the meeting of Redlands 2030 at which Sean Foley from BFPCA spoke and also emailed and phoned Federal, State and local politicians and councillors and the contacted the media to make them aware of the SMBI situation and the complete lack of consultation and engagement that Asa had had with the SMBI residents.
- A meeting of the SMBI Community Action Group was held on 19/6/2023 on Macleay island to discuss the issues and guest Karilyn Beiers was invited to speak and provide further information.

RECENT and CURRENT ACTIVITIES:

- A small group of residents from the SMBI Community Action group attended the Asa community consultation meeting at Cleveland on 19/8/2023. Their aim was to alert the Asa as to inaccuracies on their website and to object to their lack of engagement with the SMBI. In particular SMBI residents have been concerned about what appears to be a misunderstanding of the location and make-up of the SMBI. It seems that there has been some confusion between the four inhabited SMB islands and the uninhabited islands to the south of the SMBI which are part of the SMBI National Park. Also listings on the Asa website show estimated heights for the proposed Phase 1 flight paths over uninhabited islands near the SMBI rather than over the inhabited islands of the SMBI. Listing heights for uninhabited areas just does not make sense.
- Examples of lack of engagement are: Despite the Asa website saying that Asa would meet on or near affected communities this did not occur for Phase 1 with the SMBI being left out of engagement all together. This is in spite of the Asa website having listed SMBI as potentially being affected. In addition, more recently Asa promised on their website to do a letterbox drop to all Redlands residents prior to the Cleveland Phase 2 meeting, however, only Macleay and Russell Islands received them and not Lamb or Karragarra Islands. So again, the SMBI missed out on engagement and notification of the Asa community consultation meeting.
- The residents presented a placard at the Cleveland meeting saying ‘Air services Australia so you know where the SMBI are?’ and handed Asa consultants a fact sheet about the SMBI and the nearby uninhabited islands. This was in response to the way in which the SMBI and local islands have been listed and referred to on the Asa website that indicates that Asa has not understood where people live in the Southern Moreton Bay. For example, they included SMBI and Russell Island separately on their lists of affected suburbs which makes it seem as if Russell Island is not a part of the SMBI when it actually is.
- At the Cleveland meeting Asa representative Marion Lawie stated that they ‘will not commit to coming to the SMBI’ as they only ‘go to places that will be the most

impacted'. Residents of SMBI feel that this is not an appropriate response as they will be impacted by two outgoing flight paths if the Phase 1 proposals do go ahead. It is to be noted that there are already several SMBI flight paths being used for incoming planes and adding two outgoing ones would have a dramatic affect on the islanders. It is also not in accordance with their website that states that community engagement will be held 'on or near affected communities'.

CURRENT QUESTIONS for ASA

1. Why are the current numbers of flights on the current incoming flight paths over/near the SMBI increasing?
2. Why has Asa neglected to engage sufficiently with the SMBI residents and why are they refusing to hold a community consultation meeting on the islands given that they know how difficult it is for islanders to get to mainland meetings and that their own proposed flight paths from Phase 1 will affect residents?
3. Why has Asa proposed flight paths over the islands in the first place when flights could go out over the ocean to the east of North Straddie and avoid flying over residential areas?
4. Why is the Asa projected heights of planes on the two proposed flight paths over/near the SMBI for Phase 1 (Night time over water departures South and West Options 4 And 5) showing much higher elevations (such as 16,000 feet) than the current incoming ones that are as low as 7,000 feet? It would be much more likely that the proposed ones would be even lower than the current ones because they would have just taken off from Brisbane airport.