12.2	**Submission to 2022 Draft Melbourne Airport Master Plan and Major Development Plan for Third Runway**
Directorate	City Development
Director	Kelvin Walsh
Manager	Leanne Deans
Attachment(s)	1. Brimbank Council Submission - Melbourne Airport Master Plan & MDP - 27 April 2022 [**12.2.1** - 138 pages]
Purpose	For endorsement

For Council to consider the Submission to the 2022 Draft Melbourne Airport Master Plan (2022 Master Plan) and Preliminary Draft Major Development Plan for the Third Runway (MDP), shown at **Attachment 1**, and a program of advocacy to address the health impacts on community from aircraft noise and a range of other matters.

Legislation/Council Plan/Policy Context

This report supports the Council Plan 2021-2025 strategic direction and objective of:

2. Places and Spaces - Liveable and connected neighbourhoods that support healthy and sustainable futures - A green place for all
• Liveable and Connected - Inviting and liveable spaces and facilities, connected so people can get around
• Sustainable and Green - Protect natural environments for current and future generations

3. Opportunity and Prosperity - A future focused, transforming city where all have opportunities to learn and earn - A prosperous place for all
• Growing and Transforming - Optimise community opportunities through infrastructure innovation and investment
• Earning and Learning - Everyone has access to education, training and lifelong learning to support their aspirations

4. Leadership and Governance - A high performing organisation that enacts the vision and decisions of Council through the delivery of quality and innovative services - A fairer place for all
• Engaged and Responsive - Community insights are valued to enhance connection and engagement with Council.

This report aligns with strategy 3.1.2 Enhance community opportunities as a result of major developments and infrastructure investment within the Strategic Direction for Opportunity and Prosperity.

Council officers contributing to the preparation and approval of this report, have no conflicts of interests to declare.

Issue For Consideration

Council officers have prepared a Submission to the 2022 Master Plan and MDP, which is shown at **Attachment 1**. The Submission is structured around the key themes of Health Impacts (Noise and Public Safety); Air Quality; Compensation, Human Rights, Public Safety Areas, Access, Environment, Economic Development, Statutory Planning; and Community Engagement.

It is concluded that the health impacts identified in Health Risk Assessment (HRA), which forms part of the Submission, represent an unreasonable and unacceptable risk to the

Brimbank community, in addition to other significant impacts, without any consideration by Australia Pacific Airports (Melbourne) Pty Ltd (APAM) about meaningful ways to reduce and mitigate these impacts.

It is recommended that Council does not support the 2022 Master Plan, or MDP, and submits its Submission to APAM. It is also recommended that Council write to the Chief Executive Officer, Australia Pacific Airports Corporation Limited (APAC), and relevant Federal and State Government Ministers, Shadow Ministers and Local Members, advising it does not support the 2022 Master Plan and MDP, and provides a copy of its Submission, and requesting that the Master Plan and MDP are refused.

Further advocacy to the Federal and State Governments is proposed to ensure that further airport planning appropriately addresses and mitigates the impacts on community from aircraft noise, including a review of the aircraft noise system and metrics to minimise harm to human health, and the implementation of a compensation and noise abatement program. It is also intended that other issues identified by Council, including increased traffic movement and congestion, air quality monitoring, and best practice water quality management are appropriately responded to in future airport planning. It is recommended that the Federal and State Government enter into a bilateral agreement in relation to any further development of the 2022 Master Plan (or other Master Plan) and the MDP, and establish a Community Forum, similar to that established for Brisbane Airport, or an Advisory Committee, to provide a transparent, independent and public review process; require an Environment Effects Statement including a Health Impact Assessment for off-site impacts, and prevention and amelioration measures including options, such as a Federally funded noise insulation program, a noise curfew, voluntary property acquisition and other measures; and require a Comprehensive Impact Statement to assess off-site traffic and transport impacts. Melbourne Airport should also be required to comply with relevant Victorian legislation for off-site impacts, including the Environment Protection Act 2017.

Further advocacy may also be required to progress this work with the Federal and State Government beyond the recommendations in this report.

Background

Melbourne Airport is Australia's second busiest airport and the main aviation hub for the southern part of the country. Melbourne Airport is operated by APAM, a subsidiary of APAC under a 50-year lease (to 2047) from the Australian Government.

Melbourne Airport is a significant contributor to the Victorian economy, and an important economic hub, which includes its growing business park, delivering economic benefits and opportunities for surrounding municipalities, including Brimbank.

The 2022 Master Plan has a 20-year outlook to 2042 and envisages continuing significant growth and development, including that:

- Economic activity from the Airport Precinct will increase from $7 billion to $13 billion
- Annual passenger numbers will increase from 37.4 to more than 76 million
- Annual aircraft movements will increase from 246,450 to more than 429,000
- Annual domestic and international air freight will increase from 447,600 tonnes to 980,000 tonnes
- Job numbers associated with the greater Airport Precinct will increase from 19,000 to 29,000.

Council has previously lodged submissions to the 2018 and 2013 Melbourne Airport Master Plans. The 2013 Master Plan identified the need for a third runway and identified that it would be built in an east west orientation. The east west orientation was reaffirmed in the 2018 Master Plan. Subsequent work undertaken by APAM indicated that

that the third runway in the east west orientation was no longer the optimal choice, and in late 2019, APAM announced their decision for the third runway to be planned in a north south orientation. The change in runway orientation necessitated an update to the 2018 Master Plan and preparation of the MDP in accordance with the Commonwealth Airports Act 1996 (Airports Act).

Under the Commonwealth Airports Act 1996, APAM requires approval from the Minister for Infrastructure, Transport, Regional Development and Communications for the Master Plan and the MDP, which must comply with relevant Commonwealth legislation including:

- Airports (Environment Protection) Regulations 1997
- Environment Protection and Biodiversity Conservation Act 1999.

APAM do not require State government approval, however, must consult them and give due regard to state legislation. Council is seeking to ensure that APAM comply with their obligations and responsibilities in the State Government's Environment Protection Act 2017, particularly in relation to the off-site impacts of Melbourne Airport's operations on surrounding communities.

Since 2019 Council has undertaken a range of advocacy in relation to its concerns about potential health and education impacts on the Brimbank community from a third runway in a north south orientation. This has included various letters to State and Federal Ministers, the Aviation Noise Ombudsman, the Commonwealth Chief Medical Officer, the Victorian Chief Health Officer, APAC and local Members.

Consultation

The 2022 Master Plan and MDP were made public on Monday 31 January 2022 and exhibited on Melbourne Airport's website for a period of 70 business days, from 1 February to 16 May 2022.

APAM sent approximately 1 million information brochures to community impacted by airport operations to explain the opportunities for feedback about the 2022 Master Plan and the MDP. The information brochures were sent to impacted parts of Brimbank, and included translated information in 10 languages, with additional translated information on their website.

APAM provided opportunity for community, councils and other stakeholders to make submissions to the 2022 Master Plan and MDP by lodging a written submission, or completing an online feedback form.

APAM also provided a range of opportunities for community to learn about the 2022 Master Plan and MDP through online sessions, library talks (including locations in Keilor and Sunshine), appointments, onsite walkthroughs, and park and terminal pop ups (including Brimbank Park).

Council's Media and Communication's Department promoted opportunities for the Brimbank community to participate in community information sessions on Council's social media, and Council made the Keilor Library available as a location for Melbourne Airport community information sessions.

Council also undertook targeted engagement with impacted stakeholders within Brimbank to inform the preparation of a HRA. The engagement involved online discussions about the impacts of aircraft noise, and was facilitated by Dr Lyn Denison from Tonkin & Taylor. Participants included Brimbank residents, education and early learning organisations and Brimbank members of the Melbourne Airport Community Aviation Consultation Group.

The outcomes of the stakeholder engagement show that the residents in parts of Keilor, Keilor Park, Keilor Village and Kealba are adversely impacted by the current operations of the Melbourne Airport. Noise from aircraft take-offs and landings is causing sleep disturbance and increased levels of stress and anxiety in the impacted community. People are unable to enjoy their homes and cannot utilise their outdoor areas. The proposed airport expansion is predicted to worsen these impacts and affect more people in Brimbank. The majority of community that participated in the HRA engagement felt their concerns have been dismissed by APAM and are feeling frustrated and helpless. This is having a significant impact on the health and wellbeing of the impacted community. It is acknowledged that aircraft noise impacts community outside these suburbs, and across a broader area of Brimbank.

Analysis

The key changes in the 2022 Master Plan compared to the 2018 Master Plan is that:

- The 2027 Development Concept Plan includes delivery of the third (north south) runway; planning approval, design and commencement of construction of Airport Rail; and non-aviation development in the Main Precinct & Business Precinct
- The 2042 Development Concept Plan includes completion of Airport Rail (anticipated in 2029 subject to approvals); expanding the existing terminals including an expanded Terminal 4 and a new Terminal 5; aviation and non-aviation development in the western sub-precinct, including a road connection to Kings Road and the Calder Freeway; and an expanded internal road network.

Council's Submission to the 2022 Master Plan and MDP is shown at **Attachment 1.**

While the growth and development of Melbourne Airport potentially delivers economic benefits to Brimbank, there are also a range of impacts that would result in significant disadvantages as well. These include implications for community health and wellbeing, education, traffic congestion and pollution, the environment and the future development potential of Brimbank.

Key concerns include:

- Aircraft noise - Aircraft flightpaths and associated noise during the day and night could result in a range of health impacts, including sleep disturbance and children's cognitive function, as well as the enjoyment of outdoor private and open spaces.

- Air quality - Air and land-based traffic over and through Brimbank could have a range of associated health, environmental, economic and amenity impacts. Council has previously highlighted a range of access issues including traffic congestion on local roads, poor active transport connections, a need for increased public transport including airport rail (now government policy) and increased bus services.

- Airport operations and development – The operation of Melbourne Airport has resulted in contamination onsite and off-site, would result in the loss of biodiversity and habitat, cultural and post contact heritage through land clearing, drainage and other infrastructure construction.

- Safeguarding – There are limitations on development associated with safeguarding impacting Brimbank. Key issues include the changing nature of the Australian Noise Exposure Forecast (ANEF), which is updated according to each updated Master Plan; and the Public Safety Area of Melbourne Airport, which will impact properties in the City of Brimbank, although no mitigation or compensation is proposed for these property owners by Melbourne Airport.

The most significant impact on Brimbank is aircraft noise. The 2022 Australian Noise Exposure Forecast (ANEF) shows the 25 contour impacting areas of Keilor, Keilor Park and Keilor North in Brimbank; while the ANEF 20 contour extends as far south as Sunshine North and covers the suburbs of Keilor, Keilor Park and Kealba. The N contour, a complementary aircraft noise contour system that shows the average number of aircraft noise events above 60, 65 or 70 decibels over a 24-hour period, extends even further over Brimbank. In summary, the 2022 Master Plan and the MDP will result in 200+ flights over parts of Brimbank each day, averaging 60 and 70 decibels, with individual events exceeding 100 decibels in locations like Keilor.

The HRA prepared by Tonkin & Taylor, and shown in **Attachment 1,** highlights that aircraft noise within the ANEF 20 & ANEF 25 exceeds the World Health Organisation Environmental Noise Guidelines (2018) (WHO Noise Guidance) and will result in an increased risk of adverse health effects within the exposed Brimbank population, including:

- A significant increase in the percentage of the exposed population that are highly annoyed by aircraft noise
- A significant increase in sleep disturbance in the exposed community, which may lead to increases in health effects such as cardiovascular disease and anxiety and depression.
- School children who live and go to school within the ANEF 20 and ANEF 25 contours are predicted to:
    - Experience a delay in reading and oral comprehension of between 3 and 5 months, compared to children in lower noise areas
    - Experience impacts from sleep disturbance, which may occur outside the normal night hours of 11pm to 6am
    - Potentially experience a lifelong effect on educational attainment impacts if exposure occurs during critical periods of learning at school, particularly given that exposure is predicted to occur within a population that is known to be delayed in their language and cognitive skills compared to the rest of Melbourne.
- That mitigation measures should be implemented to minimise the risk to the exposed community, and these measures should be based on national and international best practice.

APAM determine that the overall beneficial health outcomes that affect mortality outweigh the less-serious negative health outcomes of sleep disturbance, annoyance and communication interference. Significantly, APAM do not attempt to prevent or minimise the health impacts from aircraft noise on Brimbank in the 2022 Master Plan or the MDP, and this does not accord with the State Government's Environment Protection Act 2017, or best practice airport planning, where international airports provide a range of noise mitigation measures to address aircraft noise, including funded noise insulation schemes, compulsory acquisition, or a curfew.

It is concluded that the health impacts identified in HRA, which forms part of the Submission, represent an unreasonable and unacceptable risk to the Brimbank community, in addition to other significant impacts, without any consideration by Australia Pacific Airports (Melbourne) Pty Ltd (APAM) about meaningful ways to reduce and mitigate these impacts.

It is recommended that Council submits its Submission to APAM outlining the reasons its does not support the 2022 Master Plan and the MDP. It is also recommended that Council write to the APAC Chief Executive Officer, and relevant Federal and State Government Ministers, Shadow Ministers and Local Members advising it does not support the 2022 Master Plan and the MDP, and include a copy of its Submission, requesting that the Master Plan and MDP are refused.

The officer recommendation includes further advocacy to the Federal and State Governments to appropriately address and mitigate the impacts on community from aircraft noise, including that the Federal Government:

- Establish health impact guidance to protect community from aircraft noise. This should include the establishment of appropriate noise metrics that accord with health guidance established by WHO Noise Guidance, and best practice noise prevention and amelioration measures to address noise exceedances.
- Require airports to prepare Health Impacts Assessments (HIA), as part of the Master Plan and MDP, that are assessed against WHO Noise Guidance 2018 (or current)
- Require that the HIA undergoes an independent and expert peer review to ensure its veracity, and that the HIA and peer review are made available for public review.
- Requiring that Melbourne Airport meet Victorian legislation, guidelines and standards in relation to the offsite impacts from the existing and any expanded operations of Melbourne Airport.

It is also recommended that the Federal and State Government enter into a bilateral agreement in relation to any further development of the 2022 Master Plan (or other Master Plan), and or the MDP, specifically including:

- Appointing a Community Forum (similar to Brisbane Airport), or an Advisory Committee under section 151 of the Planning and Environment Act 1987, to provide a transparent, independent and public review process that enables impacted stakeholders to present their submissions for independent consideration.
- Requiring an Environment Effects Statement under the Environment Effects Act 1978, including:
  - a Health Impact Assessment for off-site impacts, specifically including the assessment of noise impacts against the World Health Organisation Environmental Noise Guidance 2018, and relevant state legislation like the Environment Protection Act 2017
  - prevention and amelioration measures to adequately address noise exceedances, including options for a Federally funded noise insulation program, a noise curfew, voluntary property acquisition and other measures.
- Requiring a Comprehensive Impact Statement process under the Major Transport Projects (Facilitation) Act 2009 to assess traffic impacts.
- Requiring that Melbourne Airport meet Victorian legislation, guidelines and standards in relation to the offsite impacts from the existing and any expanded operations of Melbourne Airport.

Further advocacy may also be required to progress this work with the Federal and State Government beyond the recommendations in this report.

Resource And Risk Implications

Resource to prepare this report and the Submission to the 2022 Master Plan and MDP have been met within the Annual Budget 2021/2022.

Community: potential impact on community, including public trust and customer service impact
• Yes – The operation and development of Melbourne Airport impacts the Brimbank community, who have made representations to APAM. If APAM and government do not appropriate respond to feedback and complaints, this will undermine the public consultation and complaints process, as well as public trust in government.

Environmental: impacts on environmental sustainability, including water/waste management, climate change, and contaminated land
• Yes - The operation and development of Melbourne Airport has resulted in contamination onsite and off-site, and will result in the loss of biodiversity and habitat,

cultural and post contact heritage through land clearing, drainage and other infrastructure construction.

Financial: significant financial impacts
• Yes – The HRA identifies significant noise impacts to parts of Brimbank, however APAM don't identify any mitigation or compensation scheme to reduce the financial impacts on land owners and residents to insulate their homes and buildings, or acquire properties that may not be fit for purpose.

Regulatory: legal, legislative or regulatory implications including the rights/obligations of stakeholders
• Yes – The approval of the 2022 Master Plan and MDP should be undertaken in accordance with the Commonwealth Airports Act 1996, Airports (Environment Protection) Regulations 1997, and Environment Protection and Biodiversity Conservation Act 1999. Due regard should be given to relevant state legislation however it is considered that the off-site health and environmental impacts do not accord with the Environment Protection Act 2017.

Safety: health, safety or duty of care impacts
• Yes - the operation and development of Melbourne Airport, particularly the construction of the third runway in the north south orientation will have significant health impacts on the Brimbank community.

Officer Recommendation

That Council:

a. Notes and endorses the Council Submission to the 2022 Draft Melbourne Airport Master Plan and Preliminary Draft Major Development Plan for the Preliminary Draft Third Runway, shown at Attachment 1.

b. Does not support the 2022 Draft Melbourne Airport Master Plan (Master Plan) and Preliminary Draft Major Development Plan for the Third Runway (MDP) for the reasons outlined in the Council Submission, shown at Attachment 1, including that:

- **a. The Master Plan and MDP do not adequately identify the environmental impacts reasonably expected to be associated with the proposed development.**
- **b. The Master Plan and MDP impose unreasonable and unacceptable health risks to the Brimbank community, as outlined in the Health Risk Assessment included in Attachment 1.**
- **c. The Master Plan and MDP do not include adequate plans for dealing with the environmental impacts, specifically including prevention and amelioration.**
- **d. The Master Plan and MDP insufficiently address a wide range of other matters in relation to Public Safety Areas, Access, Environment, Economic Development, Statutory Planning; and Community Engagement, as outlined in Attachment 1.**

c. Lodges the Submission to the 2022 Draft Melbourne Airport Master Plan and Major Development Plan for the Third Runway, shown at Attachment 1, with Australia Pacific Airports (Melbourne) Pty Ltd.

d. Writes to the Chief Executive Officer at Australia Pacific Airports Corporation Limited, advising that Council does not support the 2022 Draft Melbourne Airport Master Plan and Preliminary Draft Major Development Plan for the Third Runway, for the reasons included in this

report and recommendation b, and includes a copy of Council's Submission, shown at Attachment 1.

e. Writes to the Federal Minister for Infrastructure, Transport, Regional Development and Communications:
  a. Advising that Council does not support the 2022 Draft Melbourne Airport Master Plan (Master Plan) and Preliminary Draft Major Development Plan for the Third Runway (MDP) for the reasons included in this report and recommendation b
  b. Requesting that the Master Plan and MDP are refused.
  c. Requesting that a review of airport planning is undertaken to:
    i. Examine the aircraft noise system to minimise harm to human health and provide health impact guidance to protect community from aircraft noise. This should include the establishment of appropriate noise metrics that accord with health guidance established by World Health Organisation Environmental Noise Guidance 2018 (WHO Noise Guidance), and best practice noise prevention and amelioration measures to address noise exceedances.
    ii. Require airports prepare Health Impacts Assessments (HIA), as part of the Master Plan and MDP, that are assessed against WHO Noise Guidance.
    iii. Require that the HIA undergoes an independent and expert peer review to ensure its veracity, and that the HIA and peer review are made available for public review.
    iv. Requiring that Melbourne Airport meet Victorian legislation, guidelines and standards in relation to the offsite impacts from the existing and any expanded operations of Melbourne Airport.

f. Writes to the following Ministers, Shadow Ministers and Local Members, advising that Council does not support the 2022 Draft Melbourne Airport Master Plan and Preliminary Draft Major Development Plan for the Third Runway, for the reasons included in this report and recommendation b, and includes a copy of Council's Submission, shown at Attachment 1:
  a. Minister and Shadow Ministers including for Infrastructure, Transport, Regional Development and Communications; Environment; Education and Youth; and Health
  b. Federal Members including Federal Member for Maribyrnong; and Federal Member for Fraser
  c. State Minsters including Minister for Planning; Minister for Education; Minister for Health and Minister for Energy, Environment and Climate Change
  d. Local Members including Member for Niddrie; Member for Footscray; Member for Kororoit; and Member for St Albans.

g. Requests that the Federal Minister for Infrastructure, Transport, Regional Development and Communications and the Victorian Minister for Planning enter into a bilateral agreement in relation to any further development of the 2022 Draft Melbourne Airport Master Plan (or other Master Plan) and or the Major Development Plan for the Third Runway, specifically including:
  a. Appointing an Advisory Committee under section 151 of the Planning and Environment Act 1987, to provide a transparent, independent and public review process that enables impacted stakeholders to present their submissions for independent consideration.

b. Requiring an Environment Effects Statement under the Environment Effects Act 1978, including:

- **i. a Health Impact Assessment for off-site impacts, specifically including the assessment of noise impacts against the World Health Organisation Environmental Noise Guidance 2018, and relevant state legislation like the Environment Protection Act 2017**
- **ii. prevention and amelioration measures to adequately address noise exceedances, including options for a Federally funded noise insulation program, a noise curfew, voluntary property acquisition or other measures.**

c. Requiring a Comprehensive Impact Statement process under the Major Transport Projects (Facilitation) Act 2009.

d. Require that Melbourne Airport meet Victorian legislation, guidelines and standards in relation to the offsite impacts from the existing and expanded operations of Melbourne Airport.

Brimbank City Council

BRIMBANK CITY COUNCIL SUBMISSION

April 2022

Melbourne Airport Draft 2022 Master Plan and Preliminary Draft Major Development Plan for Third Runway

Brimbank City Council respectfully acknowledges and recognises the Wurundjeri and Bunurong Peoples as the Traditional Custodians of this land and pays respect to their Elders, past, present and future.

Hellier McFarland has prepared this submission for Brimbank Council, in collaboration with Council officers and incorporating consultancy advice commissioned by Council from experts about specific components of the Draft 2022 Melbourne Airport 2022 Master Plan and Preliminary Draft Major Development Plan for Third Runway.

Table of Contents

1. Introduction

Brimbank City Council (the "Council") welcomes the opportunity to contribute to the future planning and development of Melbourne Airport (the "Airport") through this submission to the preliminary draft 2022 Master Plan (Master Plan) and preliminary draft Major Development Plan for the Third Runway (MDP) currently on exhibition.

The Master Plan provides a comprehensive 20-year vision for development of the Airport comprising future land use and development including the runway network, terminal development access and other infrastructure and non-aviation development.

Melbourne Airport is one of the most significant gateways to Victoria and provides considerable social and economic benefits to the Victorian and surrounding communities, supporting economic development in Melbourne and Victoria.

Council acknowledges that the expansion of the Airport is likely to deliver some economic benefit to Brimbank, however when scrutinised, the Master Plan and MDP, fail to adequately demonstrate that the expansion of Melbourne Airport will not result in significantly greater disbenefits to our community through increased health, amenity environmental, economic and traffic impacts.

This submission provides Council's response to the Master Plan and MDP. For the reasons outlined in this submission**,** Council does not support the Master Plan or the MDP.

2. Executive Summary

Council has thoroughly analysed the Master Plan and MDP, with Council's internal experts reviewing the areas relating to access and traffic, environmental and cultural heritage, drainage and storm water and economic development. Council has also engaged external experts to provide a health risk assessment, an air quality assessment, noise modelling, a review of the applicable EPA legislation, an analysis of world's best practice compensation schemes (including successful noise amelioration programs) and a review the impacts on the human rights of its community.

Based on the analysis and findings of its external experts, Council submits that many of the metrics used to support the Master Plan and MDP are either not informed by an evidence-based approach, do not use world's best practice, rely on outdated information and legislation, ignore Melbourne Airport's context, and fail to adequately consider the health and wellbeing of Brimbank's residents and workers and those in neighbouring Local Government Areas (LGA's).

Council also submits that the most significant shortcomings of the Master Plan and MDP are:

- The failure to recognise the health impacts to existing residents in Brimbank and neighbouring municipalities from the current airport operations.
- The significant underestimation of the health impacts from increased aircraft noise on the Brimbank and surrounding community's wellbeing.
- The failure to consider any meaningful ways to reduce and mitigate the off-site impacts of the present and future operations of Melbourne Airport.

Council concludes that it does not support the Master Plan and MDP, due to the health impacts identified in Health Risk Assessment, which represent an unreasonable, unacceptable and inherently unfair risk to the Brimbank community, as well as the range of other significant impacts outlined in this submission.

Council's concerns are summarised under the following headings:

- Stakeholder engagement
- Health impacts (Noise and Public Safety)
- Air quality
- EPA legislation
- Compensation
- Human Rights
- Public Safety Area
- Access
- Environment
- Economic Development
- Statutory Planning

Council is seeking that the Federal Government progress a range of changes to minimise the harm to human health from aircraft noise, and improve airport planning and community consultation, including but not limited to:

- Undertaking a review of the aircraft noise system to minimise harm to human health and provide health impact guidance to protect community from aircraft noise. This should include the establishment of appropriate noise metrics that accord with health guidance established by World Health Organisation Environmental Noise Guidance 2018 (WHO Noise Guidance), and best practice noise prevention and amelioration measures to address noise exceedances,

including the establishment of a noise insulation program and compensation scheme.

- Requiring airports prepare Health Impacts Assessments (HIA), as part of the Master Plan and MDP, that are assessed against WHO Noise Guidance
- Require that the HIA undergoes an independent and expert peer review to ensure its veracity, and that the HIA and peer review are made available for public review.
- Entering into a bilateral agreement with the State Government in relation to any further development of the 2022 Draft Melbourne Airport Master Plan (or other Master Plan) and or the Major Development Plan for the Third Runway, specifically including:
    - Appointing a community forum, similar to the composition of that established for Brisbane Airport, or alternatively, appointing an Advisory Committee under section 151 of the Planning and Environment Act 1987, to provide a transparent, independent and public review process that enables impacted stakeholders to present their submissions for independent consideration.
    - Requiring an Environment Effects Statement under the Environment Effects Act 1978, including:
        - A Health Impact Assessment for off-site impacts, specifically including the assessment of noise impacts against the World Health Organisation Environmental Noise Guidance 2018, and relevant state legislation like the Environment Protection Act 2017
        - Prevention and amelioration measures to adequately address noise exceedances, including options for a federally funded noise insulation program, a noise curfew, voluntary property acquisition or other measures.
    - Requiring a Comprehensive Impact Statement process under the Major Transport Projects (Facilitation) Act 2009.
- Requiring that Melbourne Airport meet Victorian legislation, guidelines and standards, in relation to the offsite impacts from the existing and any expanded operations of Melbourne Airport.

Melbourne Airport is an important neighbour to Brimbank, and Council wants to build on its existing relationship with Melbourne Airport to:

- Improve Melbourne Airport's knowledge of the Brimbank community and impact of its operations on Brimbank
- Support Melbourne Airport to improve its engagement with the Brimbank community, to build community awareness and knowledge about the changes proposed under the Master Plan and MDP and the implications of the future expansion
- Ensure any public health impacts brought about by Melbourne Airport's current and future operation are appropriately addressed by Melbourne Airport, including existing concerns raised through the current consultation.
- To minimise the anticipated amenity impacts from the airport's expansion on the Brimbank community
- Build on the opportunities for Brimbank to benefit through employment creation and service provision supporting the operation of the Airport
- To engage in more detailed design relating to the runway network, access and other infrastructure, and non-aviation development, where there are impacts on Brimbank.

Any future work undertaken by Melbourne Airport for the Master Plan and MDP in response to this submission, should be made public to enable appropriate review,

analysis and feedback by the community and stakeholders it impacts and the general public.

A summary of Council's feedback and outcomes sought from the future development of the Master Plan and MDP are provided below:

2.1 Stakeholder and Community Engagement

- Provide for more focused consultation and communication with the surrounding community regarding the proposed changes to the Melbourne Airport, with an emphasis on the CALD community through multi-lingual information, opportunities for the less computer literate community members and the use of a less jargon and clear information explaining the proposed changes.
- Provide a framework for monitoring and auditing the anticipated outcomes of the Masterplan vision, with an undertaking that the findings of the audit are provided to the community through forum(s) such as the Community Aviation Consultation Group 1-2 times per year, with opportunities for these meetings to be hosted by the City of Brimbank and open to community.
- Continue to build the relationship with Council through regular Councillor Briefings 1-2 times per year to discuss the progress to prepare the Master Plan and MDP.
- Review established community and technical groups to improve their representation, transparency, accountability and communication.

2.2 Health Impacts (Noise & Safety)

- Acknowledge Melbourne Airport's role and responsibilities in addressing noise and its impacts on the surrounding community and land uses.
- Review the use of Australian Noise Exposure Forecast (ANEF) as the measure of noise disturbance to the community and use more appropriate measures that more accurately show noise impacts in the planning of new runways and flight paths.
- Prepare a legitimate, well founded and valid health impact assessment (HIA) in relation to the off-site noise impacts associated with the Master Plan and MDP, in accordance with World Health Organisation (WHO) Noise Guidance and the Environmental Protection Act 2017.
- Support an independent and expert peer review of the HIA to ensure its veracity, and that the HIA and peer review is made available for public review and comment.
- Ensure that any updated Master Plan and MDP responds to the HIA, and includes, but is not limited to, the identification of noise mitigation measures to adequately address and noise exceedances beyond WHO Noise Guidance, including options for a Federally funded noise insulation program, a noise curfew, voluntary property acquisition or other compensation measures.
- Support an independent expert review of the existing ANEF/N-contour systems to adequately protect the community's health and wellbeing, correctly identifying where high levels of aircraft noise/overflights will occur and development of a new noise metric to protect human health.
- Support improvements to noise complaint handling practices by introducing a register of complaints to be shared with neighbouring councils, the Environment Protection Authority (EPA) and accessible to the community. Key Performance Indicators (KPI's) should be developed to enable an assessment of how the actions undertaken have addressed the complaints made, and include a penalty system when KPI's are not met.

- Support and fund an appropriate network of Environmental Monitoring Unit (EMU's), including an EMU in Keilor Village to identify the existing areas currently impacted by aircraft noise and future areas that will also be impacted by the changes resulting from the Master Plan and MDP.
- Improve information about noise impacts and harm, with an emphasis on the CALD community and the less computer literate, and consider the use of a less jargon in the information provided.
- Commit to a program of engagement, in conjunction with Council, with the affected community in Brimbank, at least 2-3 times a year regarding the noise impacts prior to, and during the expansion of Melbourne Airport.
- Commit to further statutory consultation in relation to further development of the Master Plan and MDP to enable community and other stakeholders an appropriate opportunity to view, understand and provide feedback regarding the impacts on land and communities surrounding the airport.
- Support a transparent, independent and public approvals process, including a public review process that enables impacted stakeholders to present their submissions for independent and expert consideration about the Master Plan and MDP.
- Review the potential for more equitable noise sharing, by reconsidering the four runway configuration in consultation with neighbouring Council's, their communities and State and Federal Government.
- Implement noise mitigation measures based on national and international best practice including:
    - A noise insulation program in the areas within the ANEF 20 and ANEF 25 contours for residential premises, schools, childcare and early learning centres, aged care facilities and public buildings such as libraries and community centres.
    - A curfew between 11pm and 6am to minimise sleep disturbance that can lead to other adverse health impacts
    - Imposing noise abatement procedures that limits take-offs over the populated area within the Brimbank LGA; alternates the direction of take-offs to provide some respite to Brimbank residents from the aircraft noise; and or, limits aircraft during 11pm to 6pm to more modern and quieter aircraft
    - In the interim, extend the existing runway 27 to the east, to allow an increased use of the east/west runway, which provide a greater opportunity to noise share and deliver some respite to communities to the south and north of the airport.

2.3 Air Quality

- Commission an independent air quality assessment of the existing and proposed emissions from onsite and off-site operations detailing:
    - How the airport activities (current and proposed) are to be managed to minimise the risk of harm to human health or the environmentof surrounding.
    - Melbourne Airport's compliance with the Environment Protection Act 2017 and any other relevant legislation, including clear recommendations detailing how any noncompliance will be rectified.
    - How Melbourne Airport will meet its General Environmental Duty (GED) to minimise risk to human health and the environment including appropriate modelling to assess their effectiveness in minimising emissions.

- Commission an independent assessment reviewing the existing and proposed noise emissions from Melbourne Airport and its operations on the Brimbank and surrounding community, assessed against the Environment Protection Act 2017, including:
    - How the airport activities (current and proposed) are to be managed to minimise the risk of harm to human health or the environmentof surrounding.
    - Melbourne Airport's compliance with the Environment Protection Act 2017 and any other relevant legislation, including clear recommendations detailing how any noncompliance will be rectified.
    - How Melbourne Airport will meet its GED to eliminate such risks to human health and the environment or if it is not reasonably practicable to eliminate such risks, to be reduced so far as reasonably practicable.

2.4 Compensation

- Development of a best practice and equitable compensation scheme is required, including:
    - A Noise Amelioration Program that responds to WHO Noise Guidance, and relevant legislation.
    - Effective forms of compensation that are informed by an evidence-based approach.
    - Adequate opportunity for impacted owners of dwellings and buildings accommodating sensitive uses to review the compensation scheme and comment, and the public.

2.5 Human Rights

- Further work is required to determine the relation between aviation noise and people's health and well-being, and to ensure the needs of affected community and their human rights are not compromised by the Master Plan and MDP.
- Provide further opportunity for the general public to review and comment on the expert evidence and the conclusions outlining how Human Rights are proposed to be protected.

2.6 Public Safety Areas

- Accurately identify all properties within the Public Safety area (PSA) within the Master Plan and the MDP, and made publically available.
- Undertake appropriate consultation with all owners of properties within the Public Safety Area (PSA), including face-to-face meetings and allow an adequate opportunity for their review and comment.
- Introduce a scheme where properties within the PSA can be voluntarily offered by owners, at current market value, for purchase by Melbourne Airport/ Commonwealth, or alternatively compensation is paid for the loss of property value.

- Provide an appropriate opportunity for all owners with the PSA and the public to review and comment of the PSA purchase / compensation scheme, prior to its implementation.

2.7 Access

- An adequate assessment is undertaken of the impact that Melbourne Airport Rail will have on the future road access to the Airport in relation to potential reduction on reliance of vehicle access.
- Emphasise the importance of increased bus services connecting the airport locally and regionally.
- Emphasise the importance of a more balanced transport mode split regarding access to and from the airport. This includes greater analysis of the operation and ticket pricing for Melbourne Airport Rail to promote optimal use and modal shift by passengers and airport employees.
- Traffic modelling to be refined to more accurately reflect the anticipated future transport network serving Melbourne Airport, including Melbourne Airport Rail being in operation in the 2031 scenario.
- Further consideration be given to the Outer Metropolitan Ring Road (OMR) being delivered in a stages, with some level of connectivity to Melbourne Airport being modelled for in the 2031 scenario.
- A commitment from Melbourne Airport to work with Brimbank and surrounding councils to manage the construction impacts of the Airport on local roads.
- A more detailed assessment on the delivery of improved cycling connections is required (including along Arundel Road), with a focus on reducing car and bus transport to and from the airport.
- A commitment from Melbourne Airport to undertake preliminary planning with Council and the Department of Transport (DoT) regarding the western access and connection to Kings Road and the Calder Freeway, and include identifying and protecting the future road reservation through a Public Acquisition Overlay, an alignment that avoids Keilor Golf Course, and strategies to retain native vegetation and habitat connectivity.
- Identify capacity improvement to cater for traffic demand generated by Melbourne Airport, including a full diamond interchange at Calder Park Drive, widening and strengthening of the Maribyrnong River bridge and additional lanes /emergency lanes between Keilor Park Drive and Melton Highway prior to any additional traffic volumes being accommodated at the Kings Road interchange.
- A commitment from Melbourne Airport to bring forward the timeframes to 0-5yrs, for proposed local bus routes to Sunshine, St Albans and Watergardens
- Include the provision of a dedicated express service (i.e. SkyBus) from Sunshine Railway Station to the airport in advance of delivering the Melbourne Airport Rail project.
- A commitment from Melbourne Airport that trucks will be prohibited from accessing McNabb and Arundel Roads during any construction period, as these roads are not constructed to carry heavy loaded truck movements, while the Arundel Road Bridge over the Maribyrnong River is not suitable for fully loaded truck movements.

2.8 Environment

- Further detailed initiatives to minimise and reduce greenhouse gas emissions are undertaken, including but not limited to:

  - Committing to 100% renewable electricity, including for landside operations
  - Engaging an independent expert to conduct a climate change impact assessment to model the impact of the third runway on emissions
  - Commit to achieving a Level 4 Transformation or above within a set timeframe.

- A commitment to deliver sustainable transport connections including rail, bus and cycling within 0-5 years and detailing how this will be achieved.
- A commitment to develop a coordinated integrated water management plan to reduce storm water flows into waterways, improve water quality and peak flow levels
- A commitment to review and adjust water quality targets to provide opportunities for improvement of water quality.
- A commitment to incorporate stormwater treatment systems that aim to mimic natural water flow patterns of the region.
- Commit to regular updates from Melbourne Airport's Environment and Sustainability Team to the CACG and Planning Coordination Forum (PCF).
- A commitment to proactive and coordinated land management efforts across and municipal boundaries, including pest plant and animals control programs
- Engage an independent expert to determine the significant environmental management requirements and mitigate impacts on landscape and scenic values with the Deep Creek and Maribyrnong River boundary, and share with impacted councils and stakeholders to enable an integrated and collaborative approach to land management
- Engage an independent expert to determine the impact of odour (fumes) on surrounding communities, and detail clear mitigation measures to provide reassurance to the community regarding their safety, and share with relevant government agencies and councils to promote assurances about future management.
- Clearly detail the environmental impacts associated with the proposed western connection to the Airport, and undertake early engagement with Council
- Engage an independent expert to review the Targets and Actions for Biodiversity and Conservation in the Environment Strategy, focusing on conservation values, with regards to pest plant and animal control across the site, inclusive of all waterways and conservation/recreation areas.
- Demonstrate more clearly how Melbourne Airport will become a model environmental leader in the rapid transition away from fossil fuels by having specific reference to short and medium-term targets and KPI's that are publicly available and consistent with Victoria's net-zero by 2050 legislated climate target, and other strategic documents such as the integrated water management plans for the Maribyrnong and Yarra catchments in the Master Plan.
- Strengthen Melbourne Airport's stewardship responsibilities through stronger commitments to coordinate conservation land management activities with surrounding land managers.

- Engage an independent expert to review the Targets and Actions for land, surface water and groundwater management in the Environment Strategy to ensure improved outcomes for the environment will result.
- Clearly identify key vectors of weed invasion, and detail how these risks will be mitigated and managed, including during the earthworks, and standards for imported fill.
- Clearly identify and detail the impacts of habitat disturbance, lighting and noise on fauna, and the specific mitigation(s).
- Melbourne Airport engage an independent expert to review, clearly identify and detail the impacts and management strategies on the existing fauna, listed threatened species and ecological communities

2.9 Economic Development

- Detail how the Master Plan and MDP will mitigate any negative economic impacts from the airports existing and future operations e.g. amenity impacts that can reduce property values and restrictions on development.
- Detail how the Master Plan & MDP will mitigate any negative economic impacts from the airports existing and future operations on Brimbank e.g. amenity impacts that can reduce property values and restrictions on development.
- Detail how Melbourne Airport will partner with Council to develop local employment, service delivery and procurement policies and practices with a positive prejudice toward business services in neighbouring municipalities
- Detail how Melbourne Airport will partner with Council to introduce employment programs and/or work collaboratively with Council's 'Local Jobs for Local People Program' to deliver actual jobs to local people, increasing employment opportunities through apprenticeships, training, employment pathways, etc. for our community at Melbourne Airport and in related industries and operations.
- Establish employment targets regarding the number of people employed at Melbourne Airport from Brimbank and neighbouring LGAs and share this information bi-annually with councils.
- Commit to the promotion of employment opportunities at the airport, with consideration to local Jobs Fairs, Brimbank Joblink and an Employment Accord with Council.
- Detail how Melbourne Airport will work with local educators to promote jobs training and career pathways at the Airport
- Detail how Melbourne Airport will strengthen links with the Sunshine National Employment and Innovation Cluster, including the Sunshine Metropolitan Activity Centre and the Sunshine Health, Wellbeing and Education Precinct focused around the Sunshine Hospital.
- Detail how Melbourne Airport will promote future technology changes, including automated vehicles and the impact on future land use and development, and advanced aircraft technology, including electronic engines and other advancements that will promote production of quieter aircrafts.
- Detail how Melbourne Airport will partner with Council and Western Melbourne Tourism to develop and promote tourism opportunities for Melbourne's west and

Sunshine e.g. by commemorating the role of Sunshine and HV McKay in the creation of the Royal Flying Doctors Service through a mural at the Airport.

2.10 Statutory Planning

- Identify the importance and implications for affected property owners and future owners associated with any delay by the State Government in updating the Melbourne Airport Environs Overlay to reflect the 2022 ANEF in the Master Plan.
- Identify the importance and implications for affected property owners and future owners associated with the Obstacle Limitation Surface (OLS) and commit to working with the State Government to develop an Overlay for the Obstacle Limitation Surface within the Victorian Planning Provisions.
- Consider the role of the surrounding green wedge land and limits on viable uses for property owners, including the role of Melbourne Airport in future planning for green wedges, and funding a potential compensation scheme.

3. Background

Brimbank is strategically located at the centre of Melbourne's west comprising the areas of Deer Park, Keilor, St Albans, Sunshine and Sydenham. Brimbank is bordered by the western growth area municipalities of Wyndham and Melton and as the fifth most populous metropolitan municipality, Brimbank covers 123 square kilometres with a culturally diverse community of 208,443 residents (Estimated Resident Population 2017) who speak over 90 different languages where English is not a first language for 58.4% of residents (Brimbank Profile ID 2016).

Brimbank has the attributes driving regional growth including a central location in Melbourne's West, road and transport connections including metropolitan and regional rail, access to a growing labour force and land including the second largest supply of industrial land in Melbourne's West. With over 13,000 businesses providing 82,333 jobs, significant business sectors in Brimbank include construction, logistics, rental/hiring/real estate services, professional/scientific/technical services, retail trade and manufacturing (Brimbank Profile ID 2016).

Melbourne Airport is located within the City of Hume near the southern municipal boundary adjoining the City of Brimbank and has a substantial presence and interface with the Tullamarine and Keilor Park industrial precincts, the Brimbank Green Wedge area, the Maribyrnong River and residential land.

Brimbank's established residential areas of Keilor, Taylors Lakes, St Albans and Sunshine (including Sunshine North) are located beneath existing flight paths. These areas include a combined area of 3547 hectares and 23,750 dwellings (Brimbank Profile ID 2016). Neighbouring suburbs are also impacted by these flight paths.

3.1 Melbourne Airport

The Melbourne Airport is situated on land leased from the Commonwealth by Australia Pacific Airports (Melbourne), with the airport being originally operated by the Commonwealth Government until 1977.

The airport lease requires that the airport site be developed as a Major International Airport and have regard to:

a. The future growth in and pattern of traffic demand for the airport side
b. The quality standards reasonably expected of such an airport in Australia
c. Good business practises
d. The lessee must at all times provide for access to the airport by intrastate, Interstate and international air transport

The airport covers approximately 2741ha, with around 2650ha of Commonwealth leased land and about 90ha of freehold lane all located in the City of Hume.

In 1939, the Commonwealth Minister for Defence identified the need for a new airport site in Melbourne to replace the Essendon airport.

The Tullamarine site was chosen because it offered the opportunity for long-term growth combined with convenient access to Melbourne CBD.

The land was formalised for this purpose in 1959, with much of the existing airport infrastructure including the two runways and main terminal complex constructed in the 1960s, with international flights commencing in 1970, followed by domestic flights in 1971.

A condensed history of Melbourne Airport is provided below in Table 1:

Table 1

Year	Action
1939	The Federal Government identified a need for a new airport for Melbourne
1959	Tullamarine is announced as airport site comprising 2 runways
1960's	The future of the airport to comprise 4 runways
1990	Airport Strategy – confirmed the future 4 runways
1998	Four (4) runways shown in the Master Plan
2003	Master Plan identified the need for 3rd runway in 20 years
2013	Master Plan identified the east west runway as a 3rd runway
2018	Master Plan confirmed the east west runway as a 3rd runway
2022	Draft 2022 Master Plan introduces a 3rd runaway, orientated north south parallel to the existing north south runway.

Melbourne Airport is Australia's second largest airport, the 26th largest in Asia Pacific region and the world's 58th largest airport, based on 2019 passenger numbers.

Notably, Melbourne Airport it is now the largest major airport on the eastern seaboard that does not have a curfew operating, 24 hours a day, 365 days a year and providing it significant competitive advantages over other Australian airports.

Most airline operations are between 6:00 AM and 11:00 PM, which create two significant peaks for aircraft movements. The first is in the morning with a second in the afternoon to evening.

The morning peak is the combined result of international arrivals and domestic day passengers, while the evening peak is driven more by domestic day return passengers, as illustrated in Table 2.

Table 2

Comparison & Forecasting	2018/19	2041/42
Passenger numbers	37 Million	77 Million (83 Million in 2046)
Freight/tonnes	488,000	980,000
Air movements	246,000	429,000
Car trips	130,000	270,000

In 2019, 43 airlines operated an average of 987 international and 3563 domestic flights to over 74 destinations from Melbourne Airport, in the same year it handled 37.1 million domestic (70%) and international passengers (30%).

Melbourne Airport currently operates two intersecting runways in a cross style configuration, with one runway oriented north south and the other east west.

The ability to use its runways is largely driven by weather conditions. Pilots typically operate towards the wind. However, aircraft can operate with some component of crosswind and to a lesser extent, with a component of tail wind

Wind patterns at Melbourne airport are generally north east for most of the year but during summer there is a more southerly component to the prevailing winds, resulting in the existing east West runway having a crosswind component for a large part of the year.

Air Traffic controllers generally nominate which runway a pilot will use depending on certain criteria, with weather conditions being the most prevailing consideration.

Melbourne Airport is operated by Australia Pacific Airports (Melbourne) Pty Ltd (APAM). Under the *Commonwealth Airports Act 1996* (Airports Act), the Master Plan and MDP require the approval of the Minister for Infrastructure, Transport, Regional Development and Communications, currently the Hon. Barnaby Joyce.

APAM has a responsibility to comply with relevant Commonwealth legislation including:

- Airports (Environment Protection) Regulations 1997
- Environment Protection and Biodiversity Conservation Act 1999.

Regard should also be given to Victorian legislation, including where there are off-site impacts, and this includes the Environment Protection Act 2017.

In accordance with the Airports Act, APAM are required to consult:

(a) The Minister of the State in which the airport is situated, with responsibility for town planning or use of land;

(b) The authority of that State with responsibility for town planning or use of land;

(c) Each local government body with responsibility for an area surrounding the airport.

While State Government approval is not required, the State Government or individual Ministers and departments, can be submitters to the statutory consultation process for the Master Plan and MDP.

4.1 The Melbourne Airport Environs Overlay & Noise contours

The Victorian Government has long planned for the protection of Melbourne Airport, with planning controls aimed at protecting the four-runway layout in place since 1990.

The Melbourne Airport Environs Overlay (MAEO) is a planning control that was introduced by the Victorian Government in 2007, noting that planning controls for airport noise have applied to land in the Cities of Brimbank, Hume, Melton and Moonee Valley (and former councils) since 1992.

The Purpose of MAEO at Clause 45.08 of the Brimbank Planning Scheme is to:

- *To implement the Municipal Planning Strategy and the Planning Policy Framework.*
- *To ensure that land use and development are compatible with the operation of Melbourne Airport in accordance with the relevant airport strategy or master plan and with safe air navigation for aircraft approaching and departing the airfield.*
- *To assist in shielding people from the impact of aircraft noise by requiring appropriate noise attenuation measures in dwellings and other noise sensitive buildings.*
- *To provide for appropriate levels of noise attenuation depending on the level of forecasted noise exposure.*

The MAEO can limit the number of households, schools, child-care centres and other sensitive uses in areas exposed to moderate and high levels of aircraft noise, to ensure land use and development remains compatible with the 24- hour, 7 day a week operation of Melbourne Airport.

The MAEO identifies areas that will be subject to moderate to high levels of forecast aircraft noise, based on the Commonwealth-approved Australian Noise Exposure Forecast (ANEF), which is the current, longstanding measurement of noise disturbance to the community, under or near existing and planned runways and flight paths.

The MAEO measures are guided by the Australian Standard 2021-2015: Acoustics - Aircraft noise intrusion – Building Siting and construction and include insulation and window treatments.

The areas where these controls apply are determined by an airport's forecast aircraft noise exposure contours (ANEF). These contours align with the flight paths in use when an airport is operating at its ultimate capacity.

Airservices Australia endorses each airport's ANEF for technical accuracy. The ANEF is included within approved airport master plans and is the agreed metric applied in all planning jurisdictions for statutory planning purposes.

Council’s principal concern with the Master Plan and the MDP is that the documents ignore world’s best practice regarding noise and its impacts on public health. The WHO Noise Guidance highlights noise metrics and the impact on human health when exceeded, demonstrating that the current approach to airport planning is inadequate

and out of date. Notably, the ANEF metric was intended to guide planning outcomes but is not a measure of harm from noise. Recent research around noise harm identifies that noise impacts are occurring at a lesser metric i.e. ANEF10, as opposed to the current accepted metric ANEF20. As is outlined later in this submission, the Master Plan and MDP need to be reviewed to consider and respond to contemporary research and best practice.

4.2 National Airports Safeguarding Framework

Clause 18 of all Victorian Planning Schemes requires consideration be given to the National Airports Safeguarding Framework (NASF). The NASF includes several guidelines to protect airport operations and ensure community safety from those operations.

In 2020 the Melbourne Airport Environs Safeguarding Standing Advisory Committee was convened to consider the introduction of the NASF guidelines as planning controls in the Victorian planning system.

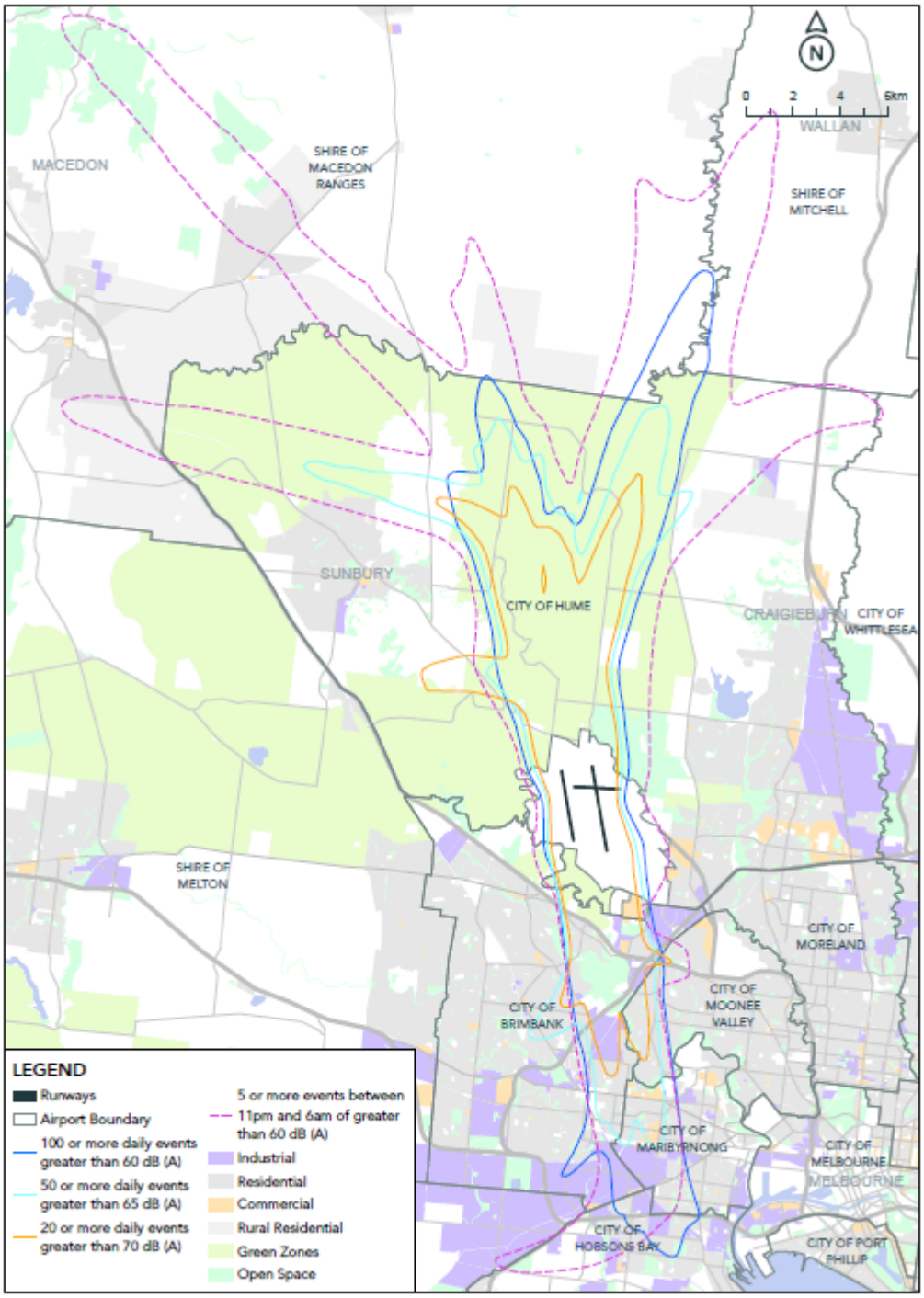
One of the controls proposed to be included was an alternative noise metrics (known as 'N' Contours or 'Number Above' Contours)

'N' Contours indicate potential noise exposure where the noise level from a single aircraft exceeds 60dB (A), 65dB (A) or 70dB (A) per day, as opposed to the annual average approach that informs the application of ANEF Contours.

Where 'N' contours exist, they should be examined when considering strategic planning proposals near airports, for example, a proposal to rezone land to facilitate more intensive residential development within airport environs. These contours would be additional to the ANEF contours, which remain the metric applied in Victoria for statutory planning purposes through the Airport Environs Overlay and MAEO.

The diagram below is sourced from the 2022 Master Plan and shows the N-contours for the third runway to 2046.

Long range N-contours for third runway to 2046



Source: Draft 2022 Melbourne Airport Master Plan

5. Key Concerns

Council acknowledges, the growth and development of Melbourne Airport delivers a range of significant economic benefits to Brimbank, however, there are a range of impacts that would also result in significant disbenefits. These key concerns are outlined below.

5.1 Health Impacts (Noise & Safety)

The most significant impact on Brimbank is aircraft noise. The 2022 ANEF 25 contour impacts areas of Keilor, Keilor Park and Keilor North in Brimbank, while the ANEF 20 contour extends as far south as Sunshine North and covers the suburbs of Keilor, Keilor Park and Kealba.

Council has engaged the expert advice Tonkin & Taylor, to undertake a health risk assessment and air quality assessment (HRA). The HRA is led by Dr Lyn Denison, a qualified scientist specialising in air quality and health risk assessment. The HRA includes noise modelling undertaken by noise experts, Marshall Day, as well as targeted community engagement, including Brimbank residents who have previously engaged with Council about Melbourne Airport, education stakeholders and Brimbank residents who are members on the Community Consultation Aviation Group. A copy of the 'Melbourne Airport Expansion Health Risk Assessment' shown at **Attachment 1**.

Dr Denison has identified in her findings that guidelines in the World Health Organisation Environmental Noise Guidelines (2018) (WHO Noise Guidance) is exceeded across the areas within the ANEF 20 and ANEF 25 contours, indicating that there is an increased risk of adverse health effects within the exposed population.

The noise impacts extend over a significant area of Brimbank, which is evident in table below, which shows the increase in noise level and quantity of overflights for selected school locations in Keilor, Kealba and North Sunshine. Individual events will often be much louder, with community currently reporting events in excess of 100 decibels. More schools, kindergartens and early childcare centres are impacted than those listed below, which are selected to demonstrate the extent of impact.

Table 3

Address	Current overflight noise events	Third runway 2026	Third runway 2046	2020 Enrolment numbers
Overnewton Anglican Community College – Senior Campus (2-30 Overnewton Road, Keilor)	• **50 - 99** N60 24 hrs • No events at N70	• **200+** N60 24 hrs (Option 1 and 2) • **200+** N70 24 hrs (Option 1)	• **200+** N60 24 hrs (Option 1 and 2) • **200+** N70 24 hrs (Option 1 and 2)	1089
Keilor Primary School (25 Kennedy Street, Keilor)	• 100-199+ N60 24 hrs • 20-49 N70 24 hrs	• 200+ N60 24 hrs • 200+ N70 24 hrs (Option 1 and 2)	• 200+ N60 24 hrs • 200+ N70 24hrs (Option 1 and 2)	486

Kealba Kindergarten (24 McShane drive, Kealba)	• 20-49 N60 24 hrs • No events at N70	• 200+ N60 24 hrs (Option 1) • 100-199+ N60 24 hrs (Option 2) • 5-9 N70 24 hrs (Option 1) • 20-49 N70 24 hrs (Option 2)	• 200+ N60 24 hrs (Option 1 and 2) • 20-49 N70 24 hrs (Option 1) • 50-99 N70 24 hrs (Option 2)	Not yet provided
Phoenix Street Children's Centre (72A Phoenix Street, Sunshine North)	• 20-49 N60 24 hrs • No events at N70	• 200+ N60 24 hrs (Option 1) • 100-199+ N60 24 hrs (Option 2) • 10-19 N70 24 hrs (Option 1) • 5-90 N70 24 hrs (Option 2)	• 200+ N60 24 hrs (Option 1 and 2) • 5-9 N70 24 hrs (Option 1 and 2)	Not yet provided
Sunshine North Primary School (65-71 Suffolk Street, Sunshine North)	• 20-49 N60 24hrs • No events at N70	• 200+ N60 24hrs (Option 1) • 100-199+ N60 24 hrs (Option 2) • 10-19 N70 24hrs (Option 1) • 5-9 N70 24 hrs (Option 2)	• 200+ N60 24hrs (Option 1 and 2) • 10-19 N70 24hrs (Option 1 and 2)	272

Note: the number of overflights change according to the runway options (e.g., option 1, 2 or 3) proposed in the MDP.

Dr Denison identifies that the metrics used in the Master Plan are those specified by AS2021-2015 which are based on amenity impacts, not health impacts, and that these do not take into account the more recent information on the health effects of noise by enHealth and WHO Noise Guidance. On this basis the values used by the Master Plan are not consistent with the metrics recommended by the WHO Noise Guidance, which have been developed to protect against long-term exposure to aircraft noise.

Melbourne Airport conclude that despite some health impacts, overall the beneficial health outcomes that affect mortality outweigh the less-serious negative health outcomes of sleep disturbance, annoyance and communication interference.

However, the expert advice provided by Dr Denison is that the Master Plan and MDP lack sufficient information and detail to fully comprehend and determine the implications and economic costs relative to the health, wellbeing and environment of the Brimbank community, and that this work should be undertaken, similar to the approach taken for other international airports.

Dr Denison prepared an assessment of the forecast aircraft noise levels against the WHO Noise Guidance and concluded that there is a risk of harm to human health, based on:

- Noise levels in the Australian Noise Exposure Forecast (ANEF) 20 and 25, exceeding WHO Noise Guidance threshold for annoyance, sleep disturbance, and cognitive development in children.

- The significant increase in traffic on local and declared roads, and the notable absence of an air quality assessment.

Council considers that a significant deficiency in the Master Plan and MDP is that no information is provided in the documents detailing how the off-site noise and air quality impacts will be prevented or minimised, in accordance with the Environment Protection Act 2017.

Best practice demand most international airports provide a range of noise mitigation measures to address noise including funded noise insulation schemes, compulsory acquisition, a curfew, and noise abatement procedures.

It is evident in Dr Denison's findings that the health impacts alone represent unreasonable and unacceptable risks to the Brimbank community.

It is also evident that Melbourne Airport has given no genuine consideration of the health implications to Brimbank's residents or any effective ways to reduce and mitigate these impacts.

Dr Denison undertook three separate focus group sessions and some individual discussions, with residents and schools under the current and proposed flight paths. A summary of their responses is provided below:

- Residents participating in the community engagement sessions raised serious concerns that the expansion of the airport will make the situation they are currently experiencing regarding their health and quality of life, much worse.
- People in Keilor Park, Keilor Village and Kealba all stated that the current situation is intolerable, as they were:
    - Only getting a maximum of 3-4 hours sleep per night and that is highly disturbed
    - Having to spend nights away from their home in order to get some sleep
    - Getting no respite from aircraft taking off
    - unable to open windows in their homes, due to the increase in noise when opened
    - unable to use the outdoor space at their homes
    - unable to hold conversations when planes were taking off and in some cases the noise was quite painful
    - unsure how they will be able to live in their current homes with an increase in flights proposed with the current plan for the airport expansion.
- A lot of older residents stated that they were depressed and are being treated by a medical professional for anxiety and depression as a result of the aircraft noise, which will only worsen with the expansion.
- Residents are unable to enjoy their homes and feel they need to sell but don't think that anyone would purchase them
- Several residents commented that they are unable to use Brimbank Park for exercise and recreation due to the aircraft noise, which is predicted to get worse with the Airport expansion.
- All the people who attended the focus groups have attended several community consultation sessions run by the Melbourne Airport Corporation and have similar concerns around the HIA but many have felt their concerns have been publicly dismissed, leaving them feeling frustrated and helpless.

Perhaps the most significant concern with the Master Plan and MDP from the residents that attended the focus groups, is their significant distrust of Melbourne Airport, which is detailed by Dr Denison's in her findings, below:

"Some of the residents in Kealba and Keilor Village questioned the accuracy of the noise predictions developed by the Airport Corporation as part of their Master Plan. A number said that according to the interactive noise tool their houses are shown as not currently being impacted by the noise from aircraft, however they are unable to sleep due or enjoy their outside areas due to the aircraft noise. Some had conducted noise monitoring at their homes and had recorded noise levels between 70 and 80 dB which is not consistent with the information provided in the noise tool when their addresses were entered into the system. This has raised concerns about the accuracy of future predictions of noise when the current experience at their homes is that they are impacted more severely than the noise tool is predicting."

Dr Denison's work also identified:

The current 'State of Knowledge' on the adverse health effects of aircraft noise indicates that there are impacts from the current and proposed operations of the airport on the exposed community in Brimbank.

The impact of the current operations on the local community as identified during the stakeholder engagement process includes sleep disturbance and anxiety and depression. These are occurring at current flight numbers, which will significantly increase under the proposed third runway development and will impact a larger proportion of the Brimbank LGA.

The Health Risk Assessment quantifies, where possible, the potential impact on the Brimbank community from the aircraft noise predicted for the Airport expansion.

The main health effects associated with environmental noise are:

- Annoyance
- Sleep disturbance
- Increase in ischaemic heart disease
- Cognitive impairment
- Psychological effects including anxiety and depression.

Dr Denison's report also describes the use of risk characterisation to estimate potential risks associated with exposure to noise from the proposed airport operations. For the assessment of health effects where there is a known threshold for effect, the metric accepted by health authorities including WHO, is that a hazard quotient of '1' or below is an acceptable risk level. Hazard quotients greater than '1' indicate an increase in the risk of adverse health effects and that mitigations should be considered to minimize risk to acceptable levels.

A summary of the findings of Dr Denison's work in relation to the main health effects associated with environmental noise resulting from existing operations and the expansion of the Melbourne Airport is provided below:

5.1.1 Annoyance

- WHO derived a guideline value of 45 dB to protect the population from being highly annoyed by aircraft noise and other adverse health effects such as increases in cardiovascular disease. The WHO acknowledge that at this level there would still be 10% of the population highly annoyed by noise.
- The ANEF 25 contour extends across the suburbs of Keilor, Keilor Park, Keilor Village and parts of Kealba. This means that 45% of the population within this

contour would be highly annoyed by the aircraft noise. The hazard quotient is 1.5 which is a 50% increase of the population impacted compared with areas that would meet the WHO guideline.

- This would indicate that there would be increases in cardiovascular disease within that population in addition to annoyance and potentially impacts on cognitive development and that a significant percentage of the adult population are potentially at risk for increases in depression and anxiety.
- The ANEF 20 contour extends as far south as North Sunshine, with the hazard quotient for the population living within this contour is 1.4, which is a 40% increase in people highly annoyed compared with areas that would be compliant with the WHO guideline.
- The total population in the 2022 ANEF 20 and 25 contours is predicted to be 15,745 by 2041 and it is estimated that 6,300 people would be highly annoyed by aircraft noise in 2041. It is highlighted that updates to the Master Plan, each five years, is likely to expand the ANEF, and therefore impact a larger population.

5.1.2 Sleep disturbance

- The WHO has established a Lnight guideline of 40 dB to protect against highly disturbed sleep. They acknowledge that this guideline is not fully protective of health as it implies that approximately 11% of the population may be characterized as highly sleep disturbed at the Guideline level.
- ANEF 25 contour corresponds to a Lnight value of 58 dB, this would mean that approximately 32% of the population within the ANEF 25 contour would be highly sleep disturbed. While, of those in the ANEF 20 contour, approximately 25% of the population would be highly sleep disturbed.
- The hazard quotients for the ANEF 25 and ANEF 20 contours are 1.5 and 1.3 respectively, resulting in a 50% increase in people highly sleep disturbed in the ANEF 25 and 30% in the ANEF 20 contours compared to areas that meet the WHO Lnight guideline.
- People in older age groups, i.e. over 65, and children form vulnerable groups in relation to sleep disturbance.
- For people over 65 years of age exposure to high levels of environmental noise, including aircraft noise can increase the prevalence of cardiovascular disease, as well as increases in anxiety and depression.
- WHO guidelines indicate that there could be an increase of approximately of 24% and 20% in anxiety and depression in that population that are with within the ANEF 25 and ANEF 20 contours, respectively.
- 27.8% of the population in Brimbank currently suffer from anxiety and depression, while the deaths per 100,000 population for ischaemic heart disease and cardiovascular disease are higher in Brimbank compared to the rest of Victoria.
- For children, sleep disturbance can lead to the inability to concentrate the following day which can impact on their cognitive development

5.1.3 Cognitive Development in Children

- Aircraft noise has been associated with delays in cognitive development in children.
- WHO identified that:
    - At a Lden level of 55 dB there is a 1 month delay in reading and oral comprehension in children compared to children in lower noise areas.
    - For every 5 dB increase above Lden of 55 dB there is additional 1-2 month delay.

- Using the 45dB the hazard quotient for cognitive development is 1.4 and 1.5 for the ANEF 20 and ANEF 25 contours respectively.
- For the areas in Brimbank within the ANEF 20 & 25 contours, this could result in a delay in reading and oral comprehension of between 3 and 5 months compared to children in lower noise areas.
- This means that for children in Brimbank living and going to school within the ANEF 20 and 25 contours, the increase in noise resulting from the expansion of the Melbourne Airport as proposed in the 2022 Master Plan would have their cognitive development delayed.
- The proportion of children assessed as being developmentally on track in the language and cognitive skills is notably lower in Brimbank (79.3%) than in Greater Melbourne (85.3%).
- Brimbank already has the third lowest proportion of children who were assessed as being on track for language and cognitive skills, compared to Greater Melbourne and the increased noise resulting from the airport expansion will likely exacerbate this.
- Approximately 18% of the population in the suburbs within the ANEF 20 and ANEF 25 contours is between the ages of 1 and 14 years of age, indicating significant number of pre-school and school aged children that may have their cognitive development impacted by the noise from the aircraft noise from the proposed Airport Expansion.
- These effects are due to direct impacts during the day as well as impacts due to sleep disturbance which may occur outside the normal night hours of 11pm to 6am.
- There are several ways in which aircraft noise could influence children's cognition:
    - lost teaching time - as a teacher may have to stop teaching whilst noise events occur
    - teacher and pupil frustration
    - annoyance and stress responses
    - reduced morale
    - impaired attention
    - children might tune out the aircraft noise and over-generalise this response to other sounds in their environment missing out on information; and
    - sleep disturbance from home exposure which might cause performance effects the next day.
- There are eight schools and childcare/early learning centres, which are predicted to be exposed to noise levels above the WHO guideline meaning that there is an increased risk of delays in reading and oral comprehension.
- This is likely to be worse for children who also live in these areas as they will also be exposed to aircraft noise in their home environment.

5.1.4 Risk Mitigation

- Examples of aircraft noise mitigation measures and government funded schemes for communities surrounding Airports can be found in Australia and overseas.
- These mitigation measures can be separated into active and passive noise abatement measures, where active measures relate to internal changes of flight paths, flight times, and aircraft models, and passive measures are more community-focused measures.
- European examples provide a framework for best practice measures to provide good passive noise abatement programs that assist pre-existing

homes mitigate the impact of noise on the residents. Examples are available from Heathrow and Frankfurt regarding retro fitting sound insulation treatments, with similar programs implemented in Australia under the Sydney Airport Noise Amelioration Program and the Commonwealth Noise Insulation Scheme for areas surrounding Adelaide airport.

- Using the criteria of the previous Commonwealth Noise Insulation Scheme, all affected areas in the Brimbank LGA would have been able to apply for the scheme that insulated buildings from aircraft noise.

Recommendation

- That the State and Federal Government require that Melbourne Airport prepare a legitimate, well founded and valid health impact assessment (HIA) in relation to the off-site noise impacts associated with the Master Plan and MDP, in accordance with WHO Noise Guidance and the Environmental Protection Act 2017.
- The State and Federal Governments require that the HIA undergoes an independent and expert peer review to ensure its veracity, and that the HIA and peer review is made available for public review and comment.
- That Melbourne Airport prepares an updated Master Plan and MDP, which responds to the HIA, and includes, but is not limited to, the identification of noise mitigation measures to adequately address and noise exceedances beyond WHO Noise Guidance, including options for a Federally funded noise insulation program, a noise curfew, voluntary property acquisition or other compensation measures.
- An independent review of the existing ANEF/N-contour systems to adequately protect the community's health and wellbeing, correctly identify where high levels of aircraft noise/overflights will occur and consideration of whether a new noise metric is required.
- That the Federal Government require Melbourne Airport to undertake further statutory consultation to enable community and other stakeholders appropriate opportunity to view, understand and provide feedback regarding the impacts on land and communities surrounding the airport.
- The need for the Federal Government to commit to a transparent, independent and public approvals process, including a public review process that enables impacted stakeholders to present their submissions for independent and expert consideration.
- Melbourne Airport address noise abatement procedures particularly at night-time and review the potential for noise sharing, by reconsidering the four runway configuration in consultation with neighbouring Council's, their communities and State and Federal Government, alternatively the following should be considered.
    - A curfew between 11pm and 6am to minimise sleep disturbance that can lead to other adverse health impacts
    - Where possible limit the take-offs over the populated area within the Brimbank LGA
    - Alternate the direction of take-offs to provide some respite to Brimbank residents from the aircraft noise
    - Limit aircraft during these hours to more modern and quieter aircraft
    - In the interim, extend the existing third runway 27 to the east, to allow an increased use of the east/west runway, which provide a greater opportunity to noise share and deliver some respite to communities to the south and north of the airport.

5.2 Air Quality

The HRA prepared by Tonkin & Taylor included an air quality assessment by Dr Denison.

Dr Denison indicates that the assessment, including air dispersion modelling, was conducted by Melbourne Airport Corporation and reviewed by GHD Pty Ltd.

Scenarios for construction as well as operations in 2026 and 2046 have been modelled and include airport operations and associated increases in traffic on the airport land. Off-site impacts have been modelled for these sources at a limited number of sensitive receptors.

The Environment Protection Act 2017 (the EP Act), and subordinate legislation came into effect on 1 July 2021 and is designed to drive environmental improvements by ensuring that individual industries take responsibility for the risks they pose to human health and the environment.

Central to the EP Act is the 'General Environmental Duty' (GED), which requires all duty holders (businesses, industries, community etc.) to understand, abate and manage their emissions to minimise the risks of harm to the environment and human health. Complying with the GED requires both being proactive and employing industry best practices to minimise risk to human health and the environment, so far as reasonably practicable.

The new EP Act came into force the same time as the Environmental Reference Standards (ERS) came into force. The ERS provide reference standards against which the impact of a development or operating business can be assessed.

The ERS for air quality adopted the air quality standards in the National Environment Protection (Ambient Air Quality) Measure. Although the ERS are not compliance standards they are used by Government Agencies in decision making processes around new developments and assessment of meeting the requirements of the GED

Prior to 1 July 2021, the State Environment Protection Policies – Ambient Air Quality and Air Quality Management, provided the framework for assessing and managing emissions to air in Victoria, however the polices were revoked post that date, meaning they now have no legal standing.

The ERS have recently been updated in February 2022 to include the new and in some areas more stringent standards.

The EPA has also released the Guideline for Assessing and Minimising Air Pollution in Victoria (2022), providing guidance on:

- how to meet the requirements of the GED with respect to air quality assessments,
- assessing best practice
- 'as low as reasonably achievable' emission controls
- establishes air quality assessment criteria (AQAC) against which air dispersion modelling results can be compared.

The AQAC replace the design criteria in the previous SEPPs.

An additional and significant failing of the MDP is that Melbourne Airport has chosen to utilise revoked (i.e., not legally valid) and less stringent criteria to measure compliance regarding the off-site impacts regarding Air Quality, and not those currently applicable in

Victoria. The deficiency in the detail of Melbourne Airport's Air Quality Assessment means that Council's expert consultants were not able to undertake an assessment against the ERS or AQAC, however they consider that if an assessment was possible, the outcomes of the assessment may differ.

A more appropriate assessment would have been to meet the current GED to minimise risk to human health and the environment should have been undertaken and the ERS and AQAC should have been used to assess the outcomes of the air dispersion modelling.

While the MDP identifies a list of potential emission control measures, none of these measures have been modelled to assess their effectiveness in minimising emissions. The main sources of air pollution from airport operations are:

- Ground based operations at the airport including taxiing, take-offs and landings of aircraft, use of ground based vehicles, diesel generators etc.
- Overflight emissions
- Increases in road traffic surrounding the airport due to the airport operations.

Council's previous concerns regarding the internalised approach taken by Melbourne Airport is highly evident in its approach to off-site impacts around sources of air pollution from airport operations. The MDP does not consider overflight emissions or road traffic surrounding the airport. While it is accepted that overflight emissions usually have minimal impact at ground level therefore excluding them from the modelling is unlikely to significantly change the outcomes of the assessment, the same cannot be said for the anticipated increase in road traffic resulting from the proposed expansion of Melbourne Airport

A further shortcoming of the MDP is that no modelling has been conducted for near road impacts off-site that would be due to increases in traffic on roads external to the airport solely attributable to the airport expansion.

This lack of modelling means that there is no ability to accurately assess the potential impacts in Brimbank attributable to increased traffic directly related to the proposed airport expansion.

It is well documented that increased traffic and associated congestion are known to increase pollution levels. Although not quantified in the air quality assessment, the predicted increases in traffic would result in increased air pollution levels to the community proximate to Keilor Park Drive and Calder Highway. The MDP has not included traffic predictions in the air quality report for other roads within the Brimbank LGA, however an extract from the Tonkin & Taylor Report illustrates the substantial increase in traffic for some of the nearby roads, below:

Table 4. Predicted Annual Increases in Traffic Keilor Park Drive and Calder Freeway west Keilor Park Drive No Build vs Build

Road Traffic Predictions	**No Build**	**Build**	**Increase in Traffic due to Airport**
Keilor Park Drive 2026	6,741,317	7,183,860	442,543
Keilor Park Drive 2046	8,972,253	10,274,506	1,302,253
Calder Fwy 2026	24,992,195	25,427,788	435,593
Calder Fwy 2046	31,602,969	33,199,029	1,596,060

The predicted concentration of nuisance dust illustrated in the MDP extend beyond the airport boundary into Brimbank, close to the residential receptor on Overnewton Road. Monitoring should be implemented at this location during the construction of the 3rd runway to ensure that the impacts are being managed so as to confine impacts within the airport boundary and not on the Brimbank community. The decision by Melbourne Airport not to use the current EP Act and Guidelines to determine the significance of the impact on increases in pollution levels means that the conclusions drawn in the MDP report are unreliable.

The EP Act is designed to drive environmental improvements by ensuring that individual industries take responsibility for the risks they pose to human health and the environment.

Central to the Act is the 'General Environmental Duty' (GED). The GED requires all duty holders (businesses, industries, community etc.) to understand, abate and manage their emissions to minimise the risks of harm to the environment and human health. Complying with the GED requires both being proactive and employing industry best practices to minimise risk to human health and the environment, so far as reasonably practicable.

The GED requires anyone engaging in any activities that may give rise to risks of harm to human health or the environment from pollution or waste to minimise those risks, so far as reasonably practicable. This requires such risks to either be eliminated, or if it is not reasonably practicable to eliminate such risks, to be reduced so far as reasonably practicable.

Dr Denison describes, how this obligation translates:

In determining whether it is reasonably practicable to minimise risks of harm to human health and the environment, the following matters are relevant:

- *The likelihood of the risk eventuating.*
- *The degree of harm that would result if the risk eventuated.*
- *What the person knows, or ought reasonably to know about the harm or risks of harm and any ways of eliminating or reducing those risks.*
- *The availability and suitability of ways to eliminate or reduce the risk.*
- *The cost of eliminating or reducing the risk.*

The GED requires the duty holder to reduce the risk of harm to human health and the environment from pollution and waste. Noise comes under the category of pollution, and it includes vibration. As far as reasonably practicable, if the duty holder's activity involves noise it's their duty to reduce the levels of risk. Businesses must not cause unreasonable noise or aggravated noise. They must make sure that any noise from their activities or premises doesn't unreasonably impact the local community.

As also outlined, Melbourne Airport has a responsibility to comply with relevant Commonwealth legislation and have due regard to Victorian legislation, with a particular regard to Environment Protection Act 2017 as the proposed airport expansion will result in off-site amenity impacts. However, Melbourne Airport, through its Master Plan and more specifically the MDP have failed to apply the requirements of the EP Act and associated subordinate legislation as part of its assessments, despite this legislation being in force at the time that these reports were being prepared.

Dr Denison's findings identified:

There is no discussion of the GED and how the emissions/operations are proposed to be managed to minimise the risk of harm to human health or the environment. The SEPP design criteria, which were revoked on 1 July 2021, have been used to assess compliance with air quality requirements in Victoria. This is not valid as the design criteria have had no legal standing in Victoria since 1 July 2021.

The premise around the GED identified by Dr Denison in the Tonkin & Taylor report is consistent with long standing 'agent of change' principle (i.e. an agent introducing a new land use is responsible for managing the impacts flowing from that land use) regarding the obligations around the expansion of the airport's activities in particular amenity impacts, as detailed in the Master Plan and MDP. Consistent with the agent of change principle, there is a clear obligation on Melbourne Airport to explain how it is currently and, will in the future, ameliorate the adverse noise impacts resulting from its expansion.

Recommendation

- Melbourne Airport commission an independent air quality assessment of the existing and proposed emissions from operation to be assessed against the EP Act and Guidelines detailing:
    - How the airport activities is currently and is proposed to be managed to minimise the risk of harm to human health or the environmentof surrounding.
    - Its compliance with the the new EPA legislation and clear recommendations detailing how any noncompliance will be rectified.
    - How it will meet its GED to minimise risk to human health and the environment including appropriate modelling to assess their effectiveness in minimising emissions.

5.4 Compensation

Council engaged Marcus Lane Group (MLG) to investigate the potential for compensation for the Brimbank community adversely affected by both existing aircraft noise and future anticipated aircraft noise from the operations of Melbourne Airport. A copy of this advice is included at **Attachment 2**.

It is considered that compensation should be provided either by means of a noise amelioration program (NAP) or other forms of compensation to owners of dwellings and buildings accommodating sensitive land uses (i.e., schools, places of worship, childcare centres and hospitals) adversely affected by aircraft noise associated with Melbourne Airport.

The following excerpts of the MLG advice appropriately identify Council's position on this important matter:

"Council submits there is sound policy rationale and need for compensation to those adversely affected by both existing aircraft noise and future anticipated aircraft noise from the operations of Melbourne Airport.

The purpose of such compensation is required to reduce the impact of adverse aircraft noise on the affected communities around Melbourne Airport by either

insulating dwellings and buildings accommodating sensitive uses or by other forms of compensation, as necessary. "

The rationale and need for compensation are based on:

- Aircraft noise exposure is recognised as a health risk.
- The health effects impact people of all ages, in particular the older (> 65 years of age) and younger (1-14 years of age) members of the community and can also negative economic effects, as they impact the productivity of workers and cause a burden on health care systems.

As a result of the construction of the third runway, some dwellings and buildings accommodating sensitive uses will experience an increase in noise exposure (while others may decrease). As identified previously, the operations of the airport including those proposed under the Master Plan and MDP provide considerable benefits to the Victorian economy. Nevertheless, Council submits that it is inherently unfair that the Brimbank community must endure the significant disbenefits and recognised health risks from the excessive and prolonged exposure to adverse aircraft noise because of living and working in buildings accommodating sensitive uses close to airports or under flight paths.

Additionally, the community or 'receivers' of adverse aircraft noise living under air corridors have to not only endure the aircraft noise (and its health ramifications) but the costs, including the loss of property value and any mitigation measures (to the extent they can afford them and have undertaken remedial insulation measures).

Council questions why Brimbank and the communities proximate to Melbourne Airport are being treated differently and why such a noise mitigation scheme, has not been contemplated by Melbourne Airport, particularly as there are examples of past schemes for both Sydney Airport and Adelaide airports in addition to several overseas examples including Heathrow and Frankfurt.?

Council contends that the well-established 'agent of change principle', encapsulating the position an agent introducing a new land use is responsible for managing the impacts flowing from that land use (including adverse aircraft noise), should be invoked. Consistent with the agent of change principle, there is a clear obligation on Melbourne Airport to ameliorate the adverse noise impacts resulting from the proposed third runway.

Moreover, Council deems that Melbourne Airport has an obligation to consider impacts beyond the boundaries of the airport and where those impacts, either existing or anticipated, are unreasonable, and ameliorate those impacts or, if the impacts cannot be satisfactorily ameliorated, then compensated.

Past NAP's have used the following metrics as a basis for the level of noise attenuation to be achieved:

- 50dB(A) in bedrooms; and
- 60dB (A) in other living areas of a dwelling excluding bathrooms and laundries.

Council submits that these metrics are based on research from the late 1990's and require an evidence-based approach to their update and review. More recently, WHO has undertaken research recommending noise reduction targets of 40dB(A) in bedrooms and 45dB(A) in other habitable living areas of a dwelling, while clause

58.04.3 has been introduced into the Victorian Planning Provisions (VPP's) applying internal noise targets to apartment buildings of five (5) or more storeys.

The following excerpts of the MLG advice outlines Council's position on this matter:

"6.18 Council submits great weight should be placed on the WHO targets. This is for reason the WHO literature comprises the most recent and authoritative opinion considering aircraft noise and its impacts on health, wellbeing and quality of life. This is well documented in the NHRA prepared by Tonkin + Taylor on Council's behalf.

6.19 Council does not advocate for a particular noise target, although it submits the WHO target should be the starting position. Rather Council advocates for an outcome ensuring aircraft noise does not adversely impact sensitive receiver's health, wellbeing and quality of life. These considerations are paramount.

6.20 In achieving these paramount outcomes, Council submits further work informed by expert evidence must be undertaken to determine the criteria used in setting such targets with a view to ensuing aircraft noise does not adversely impact sensitive receiver's health, wellbeing and quality of life. To-date no such analysis has been commissioned by either the Department or Melbourne Airport.

6.21 This must be done. The outcomes of such evidence-based review should inform the extent of noise attenuation measures required"

Council submits that there are a wide range of dwelling and sensitive use types that should be eligible for either an NAP or compensation, including:

- Dwellings within the 2022 ANEF 30 to 35 contour
- Buildings accommodating sensitive land uses within the 2022 ANEF 25 contour
- Dwellings and buildings accommodating sensitive land uses constructed in accordance with the requirements of the Brimbank Planning Scheme (Scheme) and Building Act and Regulations at that time, but now proposed for inclusion in the Melbourne Airport Environs Overlay (MAEO) as a result of the 2022 ANEF contours
- Dwellings and buildings accommodating sensitive land uses constructed in accordance with the requirements of the MAEO (i.e. to meet the Australian Standard) proposed to be removed from the MAEO as a result of the third runway.
- Existing dwellings and buildings accommodating sensitive land uses constructed before the Melbourne Airport construction project was announced in 1959.
- Dwellings and buildings accommodating sensitive land uses constructed after 1959 but before the former Airport Environs Overlay was introduced on an interim basis through planning scheme amendment L45 to the former Keilor Planning Scheme in May 1992.
- Existing dwellings and buildings accommodating sensitive land uses identified within the 2022 ANEF contours (and not the 2018 ANEF contours).

Recommendation

- An adequate compensation scheme including a NAP under the existing legislative framework is prepared
- The form of compensation must be effective and informed by an evidence-based approach.
- An adequate opportunity is provided to the owners of dwellings and buildings accommodating sensitive uses for the review of the compensation scheme and comment
- An adequate opportunity is provided to the general public to review the compensation scheme and comment

5.5 Human Rights

Council engaged Marcus Lane Group (MLG) to review the impacts of the Master Plan and MDP on the human rights of its community and Victorians in general. A copy of the advice is included as **Attachment 3.**

Council submits:

- Humans have a right to enjoy a safe, clean, healthy and sustainable environment
- Such environmental rights are necessary for effective human rights protection
- The human rights of those persons (including children) who are subject to unreasonable interference occasioned by aircraft noise should be considered by the Commonwealth and their health and well-being should be ensured and integrated into decision making when determining whether to approve the Master Plan and the MDP and any conditions, which ought to apply.

Council further submits that human rights are a relevant consideration in the determination (including conditionally) of the Master Plan and MDP.

Council recognises the Charter does not apply to the Commonwealth when making an administrative decision (as in this case). Notwithstanding, as Australia is a party to seven core international human rights treaties and of these, a number of human rights embodied and protected in those treaties are triggered in this context; Council urges the Commonwealth to assess the environmental impacts and consider its human rights obligations when considering aircraft noise as part of proposed third runway.

This approach is consistent with determinations of the European Commission and the European Court of Human Rights, where the right to environmental protection is an established link to several basic human rights.

The Master Plan and MDP make clear the 'benefits and impacts of the proposal are assessed in terms of changes in noise exposure at these locations, and in terms of the number of receivers experiencing a given level of noise exposure'.

Council submits the noise and health impact assessment is seriously deficient in the Master Plan and MDP as they do not assess the actual impacts or likely noise exposure to be experienced by the community. Nor do they assess whether the impact of aircraft noise on affected community is reasonable or whether a judgment is required identifying the impacts.

Additional, to the fact there is insufficient information in the documents to assess the likely noise and its impact, rendering the proposal not supportable, there is no analysis or evidence supporting the assertions and conclusions advanced by Melbourne Airport.

Council submits that the lack of rigour and independence adopted is a fundamental defect in the documentation and warrants clear independent and expert evidence of the conclusions advanced by Melbourne Airport is presented, with opportunity provided to the community for review and comment.

The following excerpt from Attachment 3 appropriately outlies Council's position on this important matter:

48. Council also urges the decision maker to consider more broadly the relationship between aviation noise and people's health and well-being. Council submits such relationship should be better understood and better integrated into decision-making.

49. The measures to safeguard and maintain, protect and support Melbourne Airport's ongoing operations must be balanced with the needs of affected communities surrounding the airport.

50. The rights of the airport and its operations are not absolute.

51. They do not trump the human rights of noise sensitive receivers where adverse impacts are experienced.

52. Council submits the requirements of environmental protection and human rights are now in the interests both of the individual and of the national community as a whole, and the decision maker take them into account in determining whether to approve or in what manner the draft Master Plan 2022 and draft MDP.

Recommendation

- Further work is required to determine the relation between aviation noise and people's health and well-being, and to ensure the needs of affected community and their human rights are not compromised by the Master Plan and MDP.
- clear independent, expert evidence of the conclusions advanced by Melbourne Airport is presented in relation how Human Rights are proposed to be protected
- Adequate details are provided in relation to these conclusions outlining how Human Rights are proposed to be protected.
- Provide further opportunity for the general public to review and comment on the expert evidence and the conclusions outlining how Human Rights are proposed to be protected.

5.6 Public Safety Areas

The Master Plan has updated the location of the Public Safety Areas (PSA) to reflect the new location of the proposed third runway in the north/south orientation.

PSA's are designated areas of land at the end of airport runways where planning restrictions may apply.

The Master Plan explains, at Page 311:

While air crashes are rare events, the majority occur in the vicinity of airports during take-off and landing. Development within these areas may be restricted to control the number of people on the ground at risk of injury or death in the event of an aircraft accident

The PSA comprises of two areas, the 1:10,000 inner area where the risk of being killed by an aircraft is one in 10,000 per year and an outer area, where the risk decreases to one in 100,000 per year.

The incompatible uses within nominated PSA's for both the inner and outer PSA include dwelling houses, multiple dwellings, tourist parks, hostels, residential care facilities and retirement villages.

The outer PSA for the proposed third runway would extend south of the runway into 1.2 kilometres of the existing residential area of Keilor Village, at a width of 20 – 40 metres. This means that up to 60 existing dwellings and the Keilor Community Hub are now directly impacted by the outer PSA.

The implementation of NASF guidelines, as recommended in the recently released Report by the Melbourne Airport Environs Area Safeguarding Standing Advisory Committee (MAESSAC), would see the PSA's identified as an Overlay in Victorian Planning Schemes. If the MAESSAC recommendation is adopted that would mean that any vendor statement given to buyer regarding the sale of land (commonly referred to a Section 32 under the Sale of Land Act) must disclose the Planning Overlay identifying the property being sold being within the PSA.

It is evident that the nomination of any site within a PSA, where dwellings are identified as 'incompatible uses', would impact the property values of these sites.

Recommendation

- Melbourne Airport accurately identify all properties within the PSA
- Adequately communicate with all owners of properties within the PSA and allow an adequate opportunity for their review and comment
- The accurate identification of all properties within the PSA are made publicly available and allow an adequate opportunity for their review and comment.
- A purchase scheme is implemented where properties within the PSA can be voluntarily offered by owners, at current market value, for purchase by Melbourne Airport/the Commonwealth
- An appropriate opportunity be provided for all owners with the PSA and the public to review and comment of the impacts of the PSA purchase scheme, prior to its implementation.

5.7 Access

Council is concerned that Melbourne Airport's appears to be satisfied that the future (short and long-term) development of the airport, continues to rely on private vehicles and or taxi/rideshare facilitating most trips to and from the airport.

While there is some discussion in the Master Plan around passenger and employment forecasts, there does not appear to be any discussion relating to future mode splits (i.e., how are these different groups anticipated to access the airport in the future), or any aspirations/targets.

Council's declaration of a Climate Emergency and corresponding Brimbank Climate Emergency Plan calls for a much greater use of active and public transport modes to meet its municipal target of zero net emissions by 2040. As a significant employer of Brimbank residents, improved bus and cycling connections to and from the airport and its surrounds would achieve greater sustainable outcomes.

Regarding future transport modelling, the Victorian Integrated Transport Model (VITM) has assumed that the Outer Metropolitan Ring Road will be operational by 2046. However, it will not be delivered in a staged process, which would facilitate some initial road access to be delivered along the corridor, prior to a fully constructed freeway being delivered (as has been modelled for the Bulla Bypass and Melbourne Airport Link (MAL) projects.

Council is concerned that the VITM model for the 2031 reference model does not include Melbourne Airport Rail (MAR), noting it is due to be completed by 2029. The absence of MAR in the 2031 model is likely to show a greater proportion of vehicle trips to the airport than might occur.

The modelling also does not incorporate the Suburban Rail Loop (SRL) project and appears to be a missed opportunity to fast-track SRL access to the airport.

Council supports Melbourne Airport’s approach to public transport connectivity through the identification of potential new public transport routes connecting the airport to Sunshine, St Albans and Watergardens. While the connections are only identified as schematic, this would present opportunities to improve public transport access to areas of Keilor, Keilor Park, Kealba and other suburbs in Brimbank’s north, which are overly reliant on private vehicles to access daily needs.

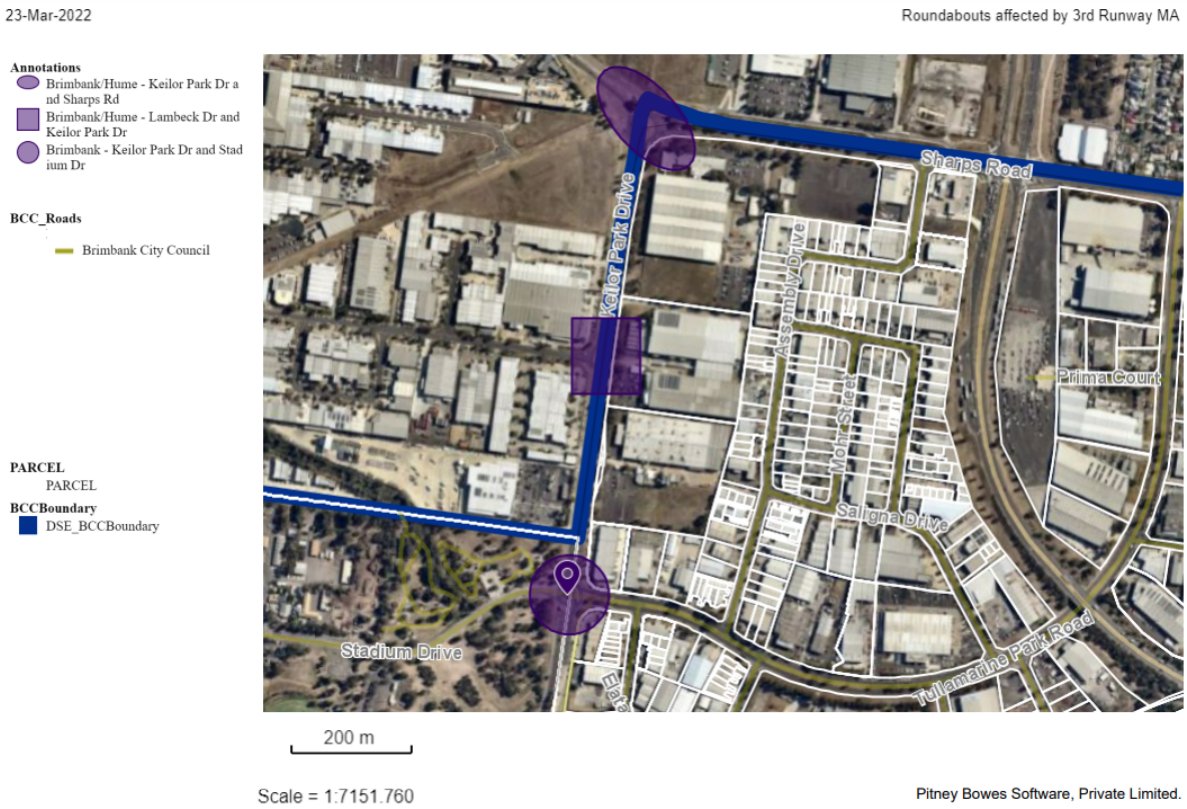
Council is concerned that the timeframes proposed in the Master Plan to deliver these routes are too long (around 6-20yrs) and considers these should be prioritised and reflected as short-term initiatives, with delivery commencing in five years.

In relation to express bus services (SkyBus), Council believe that it would be beneficial if a new direct bus connection were to be provided between Sunshine Railway Station and the airport to help generate public transport demand before Melbourne Airport Rail is completed.

Council notes the anticipated increase in truck movements outlined in the Master Plan and considers this increase should be limited to the internal road network of Melbourne Airport and the arterial road network. Council is concerned that the local road network, inclusive of Arundel Road in Brimbank, has not been designed for such movements and would require substantial remediation and ongoing maintenance throughout the construction period.

The Masterplan identifies that traffic is expected to increase by 11% within five years following the construction of the third runway, and substantially increasing to 40% by 2046. This forecast increase in congestion is significant and requires DoT and/or Melbourne Airport to prioritise the upgrade of the roundabouts at the Keilor Park Drive, Sharps Road and Tullamarine Park Road (refer image below), in addition to facilitating construction vehicle access between the proposed southern site access point of the airport, which includes Operations Road and McNabb Road and linking to the Calder Fwy / M80 Ring Road.

Table 5. Roundabouts affected by the Third Runway



If the Master Plan and MDP are approved, a 'Construction Traffic Management Plan' will be required and implemented by Melbourne Airport in conjunction with DoT. As outlined previously no truck movements should be permitted on Arundel Road, and all construction vehicles should be required to utilise the southern access of the airport via Operations Road.

Recommendation

Council submits that the approval of any Master plan and MDP be deferred until the following is included in the documents and an appropriate opportunity be provided for public review and comment:

- An adequate assessment is undertaken of the impact that Melbourne Airport Rail will have on the future road access to the Airport in relation to potential reduction on reliance of vehicle access.
- Emphasis on the importance of increased bus services connecting the airport locally and regionally.
- Melbourne Airport explicitly advocate for a more balanced transport mode split regarding access to and from the airport.
- Traffic modelling be refined to more accurately reflect the anticipated future transport network serving Melbourne Airport, including Melbourne Airport Rail being in operation in the 2031 scenario.
- Advocacy for the Airport Rail Link along the Albion East corridor and the benefits from the stop in Sunshine.

- Further consideration be given to the Outer Metropolitan Ring Road (OMR) being delivered in a stages with some level of connectivity along the OMR corridor being modelled for in the 2031 scenario.
- A commitment from Melbourne Airport to work with Brimbank and surrounding councils to manage the impacts of the Airport, including any construction processes, on local roads.
- A more detailed assessment on the delivery of improved cycling connections is required (including along Arundel Road), with a focus on reducing car and bus transport to and from the airport.
- A commitment from Melbourne Airport to undertake preliminary planning with Council and the Department of Transport (DoT) regarding the western access and connection to Kings Road and the Calder Freeway and include identifying and protecting the future road reservation through a Public Acquisition Overlay, an alignment that avoids Keilor Golf Course, and retains native vegetation and habitat connectivity.
- The Master Plan be amended to improve the functioning of the Calder Freeway, including a full diamond interchange at Calder Park Drive, widening and strengthening of the Maribyrnong River Bridge and additional lanes /emergency lanes between Keilor Park Drive and Melton Highway prior to any additional traffic volumes being accommodated at the Kings Road interchange.
- The Master Plan must include greater detail regarding the operation and ticket pricing for Melbourne Airport Rail, including possible implications these issues may have on the demand for future rail travel to and from the airport by passengers and employees.
- A commitment from Melbourne Airport to bring forward the timeframes to 0-5yrs, for proposed local bus routes to Sunshine, St Albans and Watergardens
- Include the provision of a dedicated express service (i.e. SkyBus) from Sunshine Railway Station to the airport in advance of delivering the Melbourne Airport Rail project.
- A commitment from Melbourne Airport that trucks will be prohibited from accessing McNabb and Arundel Roads during any construction period, as these roads are not constructed to carry heavy loaded truck movements, while the Arundel Road Bridge over the Maribyrnong River is not suitable for fully loaded truck movements.

5.8 Environment

Brimbank acknowledges that notable progress to improve the environmental performance of the airport over recent years, however the general environmental management approach is not aligned to the stated policy intent for the airport *'to be an environmental leader for transport and logistics sites in Australia'*.

Indeed, the environmental ambition over the next twenty years is almost absent from the Master Plan, as there is no expression of a more meaningful vision related to the above policy intent, and few proactive steps to become an exemplar sustainable airport.

The Master Plan misses the opportunity to emphasise that Melbourne Airport is the second most utilised gateway to Australia and more specifically, a gateway to one of the most liveable cities on Earth. Likewise, Melbourne Airport appears to be missing a vital opportunity to advance its reputation as a truly leading international airport in terms of sustainability, caring for Country, and climate change resilient biophilic design.

It is considered that a greater focus on sustainability and biodiversity conservation is required as part of design, construction and operation of Melbourne Airport and the third runway. The Master Plan ambitions are only to *endeavour to ameliorate* some of the airport's negative impacts on the surrounding people and environment, and it is considered this should be revised so that Melbourne Airport makes a net positive contribution in recognition of the environmental burden it imposes beyond its site boundaries.

Melbourne Airport also misses the opportunity to be a positive environmental leader in Melbourne in the context of a rapid transition away from fossil fuels. The work to construct the third runway and other associated development should consider how it can avoid and minimise adverse impacts and optimise positive benefits, through the provision of specific detail around short and medium-term targets in accordance with Victoria's net-zero by 2050 legislated climate target, and other strategic documents, such as the integrated water management plans for the Maribyrnong and Yarra catchments.

An obvious limitation in the Melbourne Airport Master Plan and MDP, including the Environmental Management Plan, is that it is too internally focussed, and any future work must acknowledge and respond to its surroundings, i.e. people, place and context.

Biophilic design is changing airports from Singapore to Mexico to Western Sydney, demonstrating that airports of the future will no longer simply be places of transit but destinations in themselves.

With respect to biodiversity and conservation management, the Master Plan fails to identify the role Melbourne Airport plays in providing protection for areas of environmental, landscape and scenic values. Moreover, it does not provide any meaningful consideration of the extent and/or appropriateness of the Melbourne Airport development boundary along Deep Creek and the Maribyrnong River, which includes steep escarpments and waterways that support habitat for the Growling Grass Frog, Australia Grayling, other fauna species and cultural heritage values. The ongoing management of these escarpments and waterways is specialised requiring significant investment to manage and rehabilitate.

As Council owns and actively manages land that directly adjoins Melbourne Airport's western boundary (Deep Creek/Maribyrnong River), Council encourages a greater partnership with the Airport and other surrounding landholders with regards to land management around pest and animal control programs.

Additionally, the Master Plan identifies opportunities to provide a road connection via the Kings Road Interchange located off the Calder Freeway, Keilor North. Further work is required to assess the environmental impacts of this proposal including on Council land and the Maribyrnong River and the Green Wedge.

Another environmental concern with the Master Plan is that it has not considered the treatment of Deep Creek, even though stormwater discharge and associated

pollutants are expected to increase as the airport footprint expands toward Deep Creek as a receiving waterbody.

Melbourne Airport also accepts that water quality discharging from the airport does not currently meet all Airport Regulations and Environmental Reference Standard (Vic) quality objectives. The MDP states that this is not an uncommon issue as many quality objectives are also not met in the broader catchment areas. The MDP however, presents an opportunity to improve surface water discharge quality, particularly from Arundel Creek which is the main discharge point for the airport. Given that the project is removing most of the Arundel Creek, it seems reasonable that the airport should be seeking to make significant improvements to water quality rather than just being satisfied with either non-compliance of regulations or minimum compliance.

Council submits that prior to any approval of the Master Plan and MDP that the targets and actions for land, surface water groundwater and storm water management in the Master plan be independently reviewed. Targets should include reference to standard water quality targets leaving the site, all flows should be appropriately treated, with the aim of all actions proposed being to improve water quality through incorporating water-sensitive urban design, to all waterways. Additionally, stormwater treatment systems should be incorporated that aim to mimic natural water flow patterns of the region.

Council has significant concerns with the impact of the project on the 78.74 ha of Grey Box Woodland (intact woodland and derived grassland), 97.89 ha of Natural Temperate Grassland of the Victorian Volcanic Plain, 9.75 ha of Golden Sun Moth habitat, 64.34 ha of Growling Grass Frog habitat and 68.02 ha of Swift Parrot habitat.

The MDP will result in a significant impact to the environment on Commonwealth land, due to:

- Large-scale clearing of native vegetation
- The removal of threatened ecological communities and species habitat
- Loss of habitat for local wildlife populations
- Substantial alteration to landscape features through removal of the majority of Arundel Creek and approximately half the Grey Box Woodland.

This is a substantial impact proximate to the conservation values including those in the adjacent Organ Pipes National Park and Council's Sydenham Park.

While noting that mitigation measures are intended to be implemented through the proposed 'Construction Environmental Management Plan', which seek to reduce impacts where possible. The limited detail outlining the efforts made to avoid and minimise such impacts, should be more clearly described before progressing to the consideration of relevant offsets.

As Melbourne Airport supports one of three largest representations of Grey Box Grassy Woodland in southern Victoria, it is essential that prior to the approval of the Master Plan or MDP, further considerations in the design and construction of this project be undertaken to reduce the impact to this Threatened Ecological Community (TEC). Where the TEC is impacted clear evidence of the efforts undertaken to minimise impacts on this TEC should be provided and explained simply within the documents.

Melbourne Airport's documentation identifies that if appropriate management or mitigation controls are not implemented, the presence of contamination in soils, sediments and groundwater and that the generation of wastes have the potential to impact the environment as part of the construction and operation of the third runway. Council is supportive of the principles proposed to manage contamination, however specific management measures of the poly-fluoroakyl substances (PFAS) are yet to be confirmed and it is unclear if the target to treat 100% of PFAS impacted wastewater includes impacted surface water discharge. Council recommends that the draft PFAS strategy is given to the relevant PCG and relevant stakeholders for comment, prior to any approval.

Council is disappointed with Melbourne Airport's lack of ambition to achieve improved status under the 'Airport Carbon Accreditation Scheme of Airports Council International' and deal with greenhouse gas emissions with a greater commitment. Melbourne Airport has achieved Level 2 status under this accreditation scheme and is low compared to Christchurch Airport, which has a considerably higher status (Level 4 Transformation status).

Council considers that this lack of ambition regarding greenhouse gas emissions is indicative of the internalised approach of Melbourne Airport, with little regard to its neighbours. Melbourne Airport should show its commitment to reducing greenhouse gas emissions by committing to the following in the Master Plan and MDP:

- Immediately switching to 100% renewable electricity including for landside operations,
- Conduct a climate change impact assessment to model the impact of the project on emissions (i.e., to calculate the indirect emissions induced through the expansionary effects of the MDP in aggregate)
- Commit to Level 4 Transformation status or above within a set timeframe.

Finally, Council notes that a Construction Environmental Management Plan (CEMP) will be developed following final design approval. Council has concerns around the environmental management of the construction project and want an opportunity to review the CEMP, and for it to be made available for public review and comment, prior to its approval.

Recommendation

Council submits that the approval of any Master plan and MDP be deferred until the following is included in the documents and an adequate opportunity is provided for public review and comment:

- Further detailed initiatives to minimise and reduce greenhouse gas emissions are undertaken, including but not limited to:
    - switching to 100% renewable electricity including for landside operations,
    - Engaging an independent expert to conduct a climate change impact assessment to model the impact of the project on emissions
    - Melbourne Airport publicly commit to achieving a Level 4 Transformation or above within a set timeframe.
- A commitment from Melbourne Airport to deliver sustainable transport connections including rail, bus and cycling within 0-5 years and detailing how this will be achieved.

- A commitment from Melbourne Airport to develop a coordinated integrated water management plan to reduce storm water flows into waterways, improve water quality and peak flow levels
- A commitment from Melbourne Airport to review and adjust water quality targets to provide opportunities for improvement of water quality.
- A commitment from Melbourne Airport to incorporate stormwater treatment systems that aim to mimic natural water flow patterns of the region.
- A public commitment from Melbourne Airport for regular communications and updates from Melbourne Airport's Environment and Sustainability Team to the CACG and Planning Coordination Forum (PDF).
- A public commitment from Melbourne Airport to recognise and detail the importance of proactive and coordinated land management efforts across boundaries, including pest plant and animals control programs
- Melbourne Airport engage an independent expert to determine the significant environmental management requirements and mitigate all potential impacts on landscape and scenic values with the Deep Creek and Maribyrnong River boundary.
- Melbourne Airport engage an independent expert to determine the impact of odour (fumes) on surrounding communities, including the involvement of government agencies and detail clear mitigation measures to provide reassurance to the community regarding their safety
- Clearly detail the environmental impacts associated with the proposed western connection to the Airport, and undertake early engagement with Council
- Melbourne Airport engage an independent expert to review the Targets and Actions for Biodiversity and Conservation in the Environment Strategy, focusing on conservation values, with regards to pest plant and animal control across the site, inclusive of all waterways and conservation/recreation areas.
- A public commitment from Melbourne Airport to elevate its aspiration to be a model environmental leader in the rapid transition away from fossil fuels, having specific reference to short and medium-term targets and KPI's that are publicly available and consistent with Victoria's net-zero by 2050 legislated climate target, and other strategic documents such as the integrated water management plans for the Maribyrnong and Yarra catchments in this Master Plan.
- Melbourne Airport publicly and explicitly acknowledge its stewardship responsibilities and the impact of land management of airport land on surrounding landholders, and a commitment to coordinate conservation land management activities with surrounding land managers
- Melbourne Airport engage an independent expert to review the Targets and Actions for Land, surface water and groundwater management in the Environment Strategy to ensure improved outcomes for the environment will result.

- Clearly identify key vectors of weed invasion, and detail how these risks will be mitigated and managed, including during the earthworks, and standards for imported fill.
- Clearly identify and detail the impacts of habitat disturbance, lighting and noise on fauna, and the specific mitigation(s).
- Melbourne Airport engage an independent expert to review, clearly identify and detail the impacts and management strategies on the existing fauna, listed threatened species and ecological communities.

5.9 Economic Development

As Australia's second busiest passenger airport and largest air freight terminal, it is acknowledged that Melbourne Airport is a significant contributor to the Brimbank economy.

The Master Plan outlines that the expansion of the airport including the precinct and is estimated to generate:

- 76.6 million passengers by 2042
- Support 19,000 airport precinct jobs, growing to 29,000 by 2042
- 71,000 Victorian tourism jobs
- 72.9 million international visitors
- $12.5 billion in tourism outputs
- $18.2 billion in international freight
- $5.7 billion in exports and $12.5 billion in imports
- $22 billion to the national economy
- $20 billion to Victoria's economy

The economic impact analysis provided in the Master Plan stated that by 2046 an additional 37,000 jobs would be in place that would not exist if the 3rd runway were not constructed, with most of these new jobs expected to be in the transport, postal and warehousing industries and the accommodation and food services industries.

It is also noted that according to the latest 2016 ABS 1,369 Brimbank residents work in the Melbourne Airport Precinct, including 380 Brimbank residents directly employed at Melbourne Airport by the APAM.

These 1369 Brimbank residing airport workers are estimated to be making a significant contribution to the overall Brimbank economy each year, including $93.40m in direct output, and an additional $52.02m direct value add, which supports a further 720 local jobs.

When the indirect amounts are added, including $97.63m indirect output and $40.74m indirect value, and 294 indirect local jobs, it results in a total annual Economic Output of $191m, with $90.76m in 'Value added' and 1014 Jobs.

The passenger and freight capacity of the Master Plan, combined with the potential benefits of the Melbourne Airport link will generate a significant incremental increase on the economic activity in Brimbank.

Notwithstanding, the Airport more positively impact the Brimbank economy by:

- Committing to procurement policies and practices that prioritise local services within neighbouring municipalities affected by the airport noise and planning restrictions.

- Partnering with Brimbank Council's Local Jobs and Local People program, around jobs training and career pathways available at Melbourne Airport, and participate in local job fairs, an employment accord, and promoting job vacancies on the Brimbank Joblink website.

Strengthening links with the Sunshine National Employment and Innovation Cluster and the Sunshine Health, Wellbeing and Education Precinct

- Partnering with Western Melbourne Tourism to develop tourism development networks in Sunshine and Melbourne's west.
- Promoting visitation to Brimbank at the Airport, including its heritage e.g. commemorating the role of Sunshine and HV McKay in the creation of the Royal Flying Doctors Service through a mural at the Airport.

It is also evident that other aspects of the Master Plan are likely to counteract the economic gains to the Brimbank economy, because of potential conflicts and externalities, for example:

- The Airport's operational impacts, e.g., Off site amenity issues such as noise and the PSA, which can impact property values
- More competition in sectors where the airport is a direct competitor, e.g., commercial land development and accommodation
- The expanded operation of the airport will restrict the development potential of some land in Brimbank, where some land either cannot be developed, or limitations are placed on the height and density of developments and restrictions placed on the subdivision of existing residential properties.

Recommendation

- Detail how the Master Plan and MDP will mitigate any negative economic impacts from the airports existing and future operations e.g. amenity impacts that can reduce property values and restrictions on development.
- Detail explicitly how Melbourne Airport will partner with Council to develop local employment, service delivery and procurement policies and practices with a positive prejudice toward business services in neighbouring municipalities
- Detail explicitly how Melbourne Airport will partner with Council to introduce employment programs and/or work collaboratively with Council's 'Local Jobs for Local People Program' to deliver actual jobs to local people, increasing employment opportunities through apprenticeships, training, employment pathways, etc. for our community at Melbourne Airport and in related industries and operations.
- The employment program introduced must have a clear measure regarding the number of people employed at Melbourne Airport and in related industries and operations and the LGA where they reside, with this information shared bi-annually with Council and neighbouring LGA's
- Melbourne Airport publicly commit to promote employment opportunities at the airport with consideration around initiatives including local Jobs Fairs, Brimbank Joblink and an Employment Accord.

- Detail explicitly how Melbourne Airport will work with local educators to promote jobs training and career pathways at the Airport
- Detail explicitly how Melbourne Airport will strengthen links with the Sunshine National Employment and Innovation Cluster, including the Sunshine Metropolitan Activity Centre and the Sunshine Health, Wellbeing and Education Precinct focused around the Sunshine Hospital.
- Detail how Melbourne Airport will promote future technology changes, including automated vehicles and the impact on future land use and development, and advanced aircraft technology, including electronic engines and other advancements that will promote production of quieter aircrafts.
- Detail explicitly how Melbourne Airport will deliver opportunities at the Airport and through its network to promote tourism assets in Brimbank and Melbourne's west.
- Detail clearly how Melbourne Airport will commemorate the role of Sunshine and HV McKay in the creation of the Royal Flying Doctors Service with a mural at the Airport
- Detail explicitly how Melbourne Airport will partner with Council to develop stronger working partnerships with regional industry bodies.

5.10 Statutory Planning

Council recognises the State Government's role in ensuring that the appropriate statutory controls are incorporated into planning schemes**.**

5.10.1 Melbourne Airport Environs Overlay

The changes to the to the Australian Noise Environment Forecast (ANEF) contours impact on a larger area of Brimbank including North Sunshine and should be reflected in the Melbourne Airport Environs Overlay (MAEO) to ensure the appropriate consideration of planning permit approvals with regard to use, density and noise attenuation.

The expedited update and application of the MAEO is important, and the Airport can play a stronger role in advocating with councils to the State Government for a Ministerial planning scheme amendment to facilitate its introduction**.**

5.10.2 Obstacle Limitation Surface

The Obstacle Limitation Surfaces (OLS) are a series of surfaces that set the height limits of objects around an aerodrome. Objects that project through the OLS become obstacles.

The assessment of planning permits and the appropriate regard to OLS would be assisted by the development of an overlay to ensure the appropriate consideration.

5.10.3 Green Wedge Zone

Council's strategic planning work program identifies the future review of the Brimbank Green Wedge Management Plan, which impacts the agricultural land located along the Maribyrnong River to the north of the municipality which is located outside the Urban Growth Boundary.

Council has received several inquiries from landowners regarding the lack of development potential of land located in the Brimbank Green Wedge Zone. Council will seek to engage Melbourne Airport in the future review of the Zone.

Recommendation

- Melbourne Airport, publicly commit to partnering with Brimbank and all impacted Councils, to advocate to the State Government for the expedited update of the Melbourne Airport Environs Overlay to reflect the 2022 ANEF.
- Melbourne Airport, accurately identify properties that require safeguarding and develop a voluntary acquisition scheme for those impacted properties.
- An adequate opportunity is provided to the owners of those impacted properties to review the voluntary acquisition scheme and comment.
- An adequate opportunity is provided to the general public to review the voluntary acquisition scheme and comment.
- Melbourne Airport, in partnership with impacted Councils, advocate to the State Government for the development of an Overlay for the Obstacle Limitation Surface (OLS)
- Melbourne Airport actively engage with Council about the future review of the Green Wedge Management Plan**.**

6. Conclusion

Councils analysis of the Master Plan and Major Development Plan, including the findings of experts engaged to analyse key components, identified that many of the metrics used to support the Master Plan and MDP are either not informed by an evidence-based approach, do not to use world's best practice, rely on outdated information and legislation, ignore Melbourne Airport's context and fail to adequately consider the health and wellbeing of Brimbank's residents and workers and those in neighbouring LGAs.

The most significant shortcomings of the Master Plan and MDP are:

- The failure to recognise the health impacts to existing residents in Brimbank and neighbouring municipalities from the current airport operations.
- The significant underestimation of the health impacts from increased aircraft noise on the Brimbank and surrounding community's wellbeing.
- The failure to consider any meaningful ways to reduce and mitigate the off-site impacts of the present and future operations of Melbourne Airport.

Council concludes that it does not support the Master Plan and MDP, and this is principally due to the health impacts identified in HRA which represent an unreasonable, unacceptable and inherently unfair risk to the Brimbank community, as well as the range of other significant impacts outlined in this submission

Melbourne Airport is an important neighbour to Brimbank, and Council wants to build on its existing relationship with Melbourne Airport in any future development of the Master Plan and MDP, especially given as the significance of its impacts on Brimbank.

Council is seeking that the Federal Government progress a range of changes to minimise the harm to human health from aircraft noise, and improve airport planning and community consultation, including but not limited to:

- Undertaking a review of the aircraft noise system to minimise harm to human health and provide health impact guidance to protect community from aircraft noise. This should include the establishment of appropriate noise metrics that accord with health guidance established by World Health Organisation Environmental Noise Guidance 2018 (WHO Noise Guidance), and best practice noise prevention and amelioration measures to address noise exceedances, including the establishment of a noise insulation program and compensation scheme.
- Requiring airports prepare Health Impacts Assessments (HIA), as part of the Master Plan and MDP, that are assessed against WHO Noise Guidance
- Require that the HIA undergoes an independent and expert peer review to ensure its veracity, and that the HIA and peer review are made available for public review.
- Entering into a bilateral agreement with the State Government in relation to any further development of the 2022 Draft Melbourne Airport Master Plan (or other Master Plan) and or the Major Development Plan for the Third Runway, specifically including:
    - Appointing a community forum, similar to the composition of that established for Brisbane Airport, or alternatively, appointing an Advisory Committee under section 151 of the Planning and Environment Act 1987, to provide a transparent, independent and public review process that enables impacted stakeholders to present their submissions for independent consideration.

- Requiring an Environment Effects Statement under the Environment Effects Act 1978, including:
  - A Health Impact Assessment for off-site impacts, specifically including the assessment of noise impacts against the World Health Organisation Environmental Noise Guidance 2018, and relevant state legislation like the Environment Protection Act 2017
  - Prevention and amelioration measures to adequately address noise exceedances, including options for a federally funded noise insulation program, a noise curfew, voluntary property acquisition or other measures.
- Requiring a Comprehensive Impact Statement process under the Major Transport Projects (Facilitation) Act 2009.

- Requiring that Melbourne Airport meet Victorian legislation, guidelines and standards in relation to the offsite impacts from the existing and any expanded operations of Melbourne Airport.

REPORT

Tonkin+Taylor

Melbourne Airport Expansion Noise Health Risk Assessment

Prepared for
Brimbank City Council
Prepared by
Tonkin & Taylor Pty Ltd
Date
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Job Number
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Executive summary

Tonkin and Taylor Pty Ltd (T+T) has been engaged by Brimbank City Council to undertake a health risk assessment (HRA) for noise from the proposed expansion of the Melbourne Airport including a new North-South runway. The draft noise contours included as part of the 2022 Melbourne Airport Master Plan extend over large parts of the Brimbank Local Government area (LGA). In addition to undertaking the HRA, T+T were also engaged to undertake limited stakeholder engagement to gain an understanding of the current impacts of noise from the airport operations and concerns about the proposed expansion and to undertake a review of the air quality assessment that has been undertaken as part of the development of Master Plan and the predicted impacts on the Brimbank LGA.

The outcomes of the stakeholder engagement show that the residents in parts of Keilor, Keilor Park, Keilor Village and Kealba are adversely impacted by the current operations of the Melbourne Airport. Noise from aircraft take-offs and landings is causing sleep disturbance and increased levels of stress and anxiety in the impacted community. People are unable to enjoy their homes and cannot utilise their outdoor areas. This impact is predicted to worsen and affect more people in the Brimbank LGA with the proposed airport expansion. The community feel that their concerns have been dismissed by the Melbourne Airport Corporation and are feeling frustrated and helpless. This is having a significant impact on the health and wellbeing of the impacted community.

The results of the HRA have shown that the proposed airport expansion will lead to significant increases in the percentage of the population that are highly annoyed by aircraft noise. It has also shown that there will be a significant increase in sleep disturbance in the exposed community which may lead to increases in health effects such as cardiovascular disease and anxiety and depression. The WHO (2018) guidelines are exceeded across the areas within the ANEF 20 and ANEF 25 contours indicating that there is an increased risk of adverse health effects within the exposed population.

A review of the baseline health profile and socioeconomic indicators for the Brimbank LGA show that the suburbs within the ANEF 20 and ANEF 25 contours are a vulnerable population to the impacts of aircraft noise. They have a lower socioeconomic status that Australia and Victoria as a whole which is a known risk factor for the adverse effects of aircraft noise. The proportion of children assessed as being developmentally on track in the language and cognitive skills is notably lower in Brimbank (79.3%) than in Greater Melbourne (85.3%). Aircraft noise has been shown in epidemiological studies to impact on children's cognitive development particularly in reading and oral comprehension. There are also higher rates of deaths from ischaemic heart and cardiovascular disease in Brimbank compared to the rest of Victoria. All these health outcomes can be exacerbated by exposure to aircraft noise.

School children who live and go to school within the ANEF 20 and ANEF 25 contours are predicted to experience a delay in reading and oral comprehension of between 3 and 5 months compared to children in lower noise areas. These effects are due to direct impacts during the day as well as impacts due to sleep disturbance which may occur outside the normal night hours of 11pm to 6am. Exposure during critical periods of learning at school could potentially impair development and have a lifelong effect on educational attainment. This impact is predicted to occur within a population that is known to be delayed in their language and cognitive skills compared to the rest of Melbourne.

Given the potential adverse effects due to the increase in aircraft noise, mitigation measures should be implemented to minimise the risk to the exposed community.

1 Introduction

Tonkin and Taylor Pty Ltd (T+T) has been engaged by Brimbank City Council to undertake a health risk assessment (HRA) for noise from the proposed expansion of the Melbourne Airport including a new North-South runway. The draft noise contours included as part of the 2022 Melbourne Airport Master Plan extend over large parts of the Brimbank Local Government area (LGA). In addition to undertaking the HRA, T+T were also engaged to undertake limited stakeholder engagement to gain an understanding of the current impacts of noise from the airport operations and concerns about the proposed expansion and to undertake a review of the air quality assessment that has been undertaken as part of the development of Master Plan and the predicted impacts on the Brimbank LGA.

This report presents the outcomes of the stakeholder engagement as well as the results of the HRA for aircraft noise. The HRA has been conducted using the most recent WHO Noise Guidelines (2018). It also presents a review of national and international approaches to mitigating the impacts of noise from airport operations on local communities. The outcomes of the review of the air quality assessment against the requirements of the Environment Protection Act (2018) and the new environmental legislation in Victoria is also presented.

1.1 Environment Protection Act (2017) as amended (2018) and Subordinate Legislation in Victoria

The Environment Protection Act 2017 (the Act), and subordinate legislation came into effect on 1 July 2021 and is designed to drive environmental improvements by ensuring that individual industries take responsibility for the risks they pose to human health and the environment. At the centre of the Act is the General Environmental Duty (GED). This requires all duty holders (businesses, industries, community etc) to understand, abate and manage their emissions so that risks of harm to the environment and to human health are minimised. Complying with the GED means taking proactive steps as well as employing industry best practices to minimise risk to human health and the environment, so far as reasonably practicable.

The GED requires anyone engaging in any activities that may give rise to risks of harm to human health or the environment from pollution or waste to minimise those risks, so far as reasonably practicable. This requires such risks to either be eliminated, or if it is not reasonably practicable to eliminate such risks, to be reduced so far as reasonably practicable.

In determining whether it is reasonably practicable to minimise risks of harm to human health and the environment, the following matters are relevant:

- The likelihood of the risk eventuating.
- The degree of harm that would result if the risk eventuated.
- What the person knows, or ought reasonably to know about the harm or risks of harm and any ways of eliminating or reducing those risks.
- The availability and suitability of ways to eliminate or reduce the risk.
- The cost of eliminating or reducing the risk.

The GED requires the duty holder to reduce the risk of harm to human health and the environment from pollution and waste. Noise comes under the category of pollution, and it includes vibration. As far as reasonably practicable, if the duty holder's activity involves noise it's their duty to reduce the levels of risk. Businesses must not cause unreasonable noise or aggravated noise. They must make sure that any noise from their activities or premises doesn't unreasonably impact the local community.

To meet the obligations of the GED, a duty holder must show they have understood and assessed the concept of minimising risks of harm to human health and the environment, including, but not limited to:

- A duty imposed on a person to, so far as reasonably practicable, eliminate or reduce the risks of harm to human health and the environment.
- A duty to determine what is reasonably practicable when minimising risks of harm to human health and the environment, including:
  - The likelihood of the risk causing harm to human health and the environment.
  - The degree of harm to human health and the environment.
  - The knowledge of the duty holder regarding harm to human health and the environment.
  - The availability and suitability of measures to eliminate or reduce the risk of harm to human health and the environment.
  - The cost to eliminate or reduce the risk of harm to human health and the environment.

2 Structure of Report

The structure of this report is as follows

- Section 3 – Outcomes of Stakeholder Engagement
- Section 4 - Noise Health Risk Assessment
- Section 5 - Risk Mitigation Measures
    - Summary of measures implemented to protect health of communities at other Australian airports and overseas
- Section 6 – Conclusions and Recommendations
- Section 7 - Review of Air Quality Assessment
- Section 8 - References

3 Stakeholder Engagement

As part of the assessment of the health effects of aircraft noise on the community in Brimbank, targeted consultation sessions were conducted. The purpose of these sessions was to gain an understanding of the current operation of the airport on the local community and the community concerns around the planned airport expansion as described in the 2022 Airport Master Plan. Council officers made contact a range of impacted stakeholders including Brimbank residents, community and sporting facilities, education and early learning organisations and Brimbank members of the Melbourne Airport Community Aviation Consultation Group (CACG). The focus was on areas impacted by aircraft noise including including Keilor, Keilor Park, Keilor Village, Kealba, and Sunshine North.

3.1 Focus Groups

The consultation sessions were run as three separate focus groups:

- Stakeholders from Keilor, Keilor Park and Keilor Village who are identified as being under the current and proposed flight paths, including Brimbank members of CACG.
- Stakeholders from Kealba, Sunshine North and Sydenham
- Education related stakeholders including schools that are under the current and proposed flight paths.

In addition to the focus groups individual discussions were held with residents of Keilor, Keilor Village and Kealba who were unable to attend the focus groups. The age of people who participated in the focus groups and individual discussions ranged from 20's through to 70+ years of age.

3.2 Key Issues

Across both community session and in individual discussions there were common themes. Many participants commented that the current operation of the airport is impacting on their ability to sleep. People in Keilor, Keilor Park, Keilor Village and Kealba stated that they get a maximum of 3 to 4 hours sleep a night and that is highly disturbed. Some residents spend nights away from home just so they can get some sleep. All the people that participated in the engagement are concerned that the expansion of the airport will make the situation they are currently experiencing much worse. People in Keilor Park, Keilor Village and Kealba all stated that the current situation is intolerable and is having an impact on their health and quality of life and don't know how they will be able to live in their current homes with an increase in flights proposed with the current plan for the airport expansion.

One of the key issues for residents in these areas is that there is no respite from the noise from aircraft taking off. They commented that they can still hear planes in the distance after take-off when the next plane takes off over their properties. There isn't a period where they cannot hear the aircraft. With the number and frequency of flights to increase with the expansion they are concerned that this will only get worse. They also noted that there has been an increase in flights that seem to circle back over their suburbs after take-off which means that they are exposed to additional noise from these flights even though they are at a higher altitude.

Residents in Keilor Park, Keilor, Keilor Village and Kealba stated that they were unable to use the outdoor space at their homes due to aircraft noise which is predicted to increase with the airport expansion. They were unable to hold conversations when planes were taking off and in some cases the noise was quite painful. Some residents commented that it felt like there was increased pressure in their ears which was quite painful. They also commented that they were unable to open the windows in their homes due to the increase in noise when they were open.

Several residents commented that they are unable to use Brimbank Park for exercise and recreation due to the aircraft noise and that this is predicted to get worse with the Airport expansion. They said that they couldn't hold a conversation during take-offs due to the noise and that the quality of their time within the park was diminished due to the constant noise from aircraft take-offs and landings.

Some residents, mainly older residents, stated that they are depressed and are being treated by medical professional for anxiety and depression. They feel that they can no longer live in their homes as the noise is unbearable and will only get worse. They believe that the aircraft noise is impacting on their health and that this will only get worse. They are unable to enjoy their homes and feel they need to sell but don't think that anyone would purchase them. They feel trapped and don't know what to do.

Many of the people who attended the focus groups have attended many community consultation sessions run by the Melbourne Airport Corporation. Many felt that the concerns that they raised during the current consultation through the HRA process had been heard but feel very strongly that they haven't been heard by Melbourne Airport Corporation – that their concerns have been dismissed in all public sessions that have been held and any additional communication with the Corporation. This has left them feeling frustrated and helpless.

Some of the residents in Kealba and Keilor Village questioned the accuracy of the noise predictions developed by the Airport Corporation as part of their Master Plan. A number said that according to the interactive noise tool their houses are shown as not currently being impacted by the noise from aircraft, however they are unable to sleep due or enjoy their outside areas due to the aircraft noise. Some had conducted noise monitoring at their homes and had recorded noise levels between 70 and 80 dB which is not consistent with the information provided in the noise tool when their addresses were entered into the system. This has raised concerns about the accuracy of future predictions of noise when the current experience at their homes is that they are impacted more severely than the noise tool is predicting.

4 Health Risk Assessment Noise

4.1 Introduction

The health effects associated with exposure to noise from airports has been extensively studied. In 2018 the World Health Organization (WHO) reviewed their Community Noise Guidelines and in this process developed health- based guidelines specific to aircraft noise. The health risk assessment (HRA) for noise has been undertaken in accordance with the Australian Government *Environmental Health Risk Assessment: Guidelines for assessing human health risks from environmental hazard* 2012" (enHealth, 2012) and the World Health Organisation (WHO) Environmental Noise Guidelines (2018). The health effects that have been assessed include annoyance, sleep disturbance, increases in cardiovascular disease and cognitive impairment in children.

4.2 Methodology

The risk assessment process detailed in the enHealth HRA Guidelines comprises five components as outlined below:

1. **Issue Identification** – Identifies issues that can be assessed through a risk assessment and assists in establishing a context for the risk assessment.
2. **Hazard Assessment** – Identifies hazards and health endpoints associated with exposure to hazardous agents and provides a review of the current understanding of the toxicity and risk relationship of the exposure of humans to the hazards.
3. **Exposure Assessment** – Identifies the groups of people who may be exposed to hazardous agents and quantifies the exposure concentrations.
4. **Risk Characterisation** – Provides the qualitative evaluation of potential risks to human health. The characterisation of risk is based on the review of concentration response relationship and the assessment of the magnitude of exposure.
5. **Uncertainty Assessment** – Identifies potential sources of uncertainty and qualitative discussion of the magnitude of uncertainty and expected effects on risk estimates.

4.3 Population Profile

4.3.1 Population and Health Profile

The baseline health status and demographics of the potentially exposed community is important to understand as it can impact on the sensitivity of the population to the adverse effects of air pollution and noise. People in older age groups (>65 years of age), with existing diseases such as respiratory and cardiovascular disease, people with asthma, children (<15 years) and people in low socioeconomic groups all fall into groups that are more sensitive to the effects of environmental pollution.

The study area for this HRA is suburbs within the Brimbank Local Government Area (LGA) that are impacted by the ANEF 20 and 25 contours released as part of the proposed Airport expansion.[1] Population statistics and baseline health data is available at both the LGA and suburb level.

[1] The ANEF system is a measure of the aircraft noise exposure levels around aerodromes. It is based on average daily sound pressure levels, which are measured in decibels. Noise exposure levels are calculated in ANEF units.

4.3.2 Population Profile

4.3.2.1 Age Profile

The most recent published census data (Australian Bureau of Statistics [ABS], 2016) for Brimbank and the affected suburbs is summarized in the **Table 4-1**. The data is also included for Victoria for comparison with the State averages.

Table 4-1: Population profile of the Brimbank LGA and affected suburbs Census 2016

Data	Brimbank	Kealba	Keilor	Keilor Park	Sunshine North	Victoria
Total population	194,319	3,194	5,853	2,719	11,700	5,929,624
0 – 14 years	18.4%	17.7%	16.9%	17%	17.7%	18.3%
15 – 64 years	67.9%	69.8%	62%	57%	67.3%	66.2%
Over 65	13.6%	12.5%	21.1%	26%	15.2%	15.6%
Median age	35	36	44	43	35	37

Source: Australian Bureau of Statistics – 2016 Census.

As can be seen from **Table 4-1** the age of the populations of Keilor and Keilor Park are higher than the Victorian average. For both suburbs this is driven by a larger percentage of the population in the >65 year age group compared to the Victorian average, a cohort that is known to be more vulnerable to the effects of air pollution and noise. Children also fall into a vulnerable group to the effects of air pollution and noise.

4.3.2.2 Health Profile

The baseline health statistics for the Brimbank area were obtained from the Brimbank Atlas of Health and Education (2019) and the Report on Population Health Data (Health West Partnership, 2012). **Table 4-2 and 4-3** summarize the health indicators and socio-economic factors for the Brimbank LGA and Victorian state measures. The health indicators shown in Table 4-2 have been linked with adverse health outcomes arising from exposure to air pollution and noise.

Table 4-2: Health Indicators – Brimbank and Victoria

Health Indicators	Brimbank	Victoria
Heart Disease	8.2%	
Anxiety and Depression	27.8%	
Asthma	11.9%	10.7%
Deaths Ischaemic Heart Disease (IHD)	31/100,000	27.8/100,000
Deaths Cardiovascular Disease	44.5/100,000	39.8/100,000

The proportion of children assessed as being developmentally on track in the areas of language and cognitive skills is notably lower in Brimbank (79.3%) than in Greater Melbourne (85.3%) (Brimbank Atlas of Health and Education, 2019). Compared with other LGAs in Greater Melbourne, Brimbank had the third lowest proportion of children who were assessed as being on track in these areas of cognitive development. Aircraft noise has been shown in epidemiological studies to impact on children's cognitive development particularly in reading and oral comprehension. This means that the Brimbank population forms a sensitive population in regard to the impacts of aircraft noise from the Airport Expansion.

4.3.2.3 Socioeconomic Profile

People who are of low socioeconomic status (SES) have been identified as a vulnerable group for the effects of air and noise pollution. This is due to the fact that people within these groups usually have poorer health status than people within higher SES groups. They may also have poorer access to medical care. In addition, they usually live in areas that are more polluted (e.g., near major roads or near industry) as property is generally cheaper in these areas.

There are several indices of social deprivation used to assess SES status in Australia. One commonly use is the Socio-Economic Indexes for Areas (SEIFA) index. The SEIFA index is a measure of relative social advantage and disadvantage and considers 20 variables to assess relative social disadvantage. The lower the SEIFA index the greater the level of disadvantage. The index is relative to a score of 1000 which is considered as the Australian average.

The SEIFA Index of Relative Socio-Economic Advantage/Disadvantage is derived from attributes such as low income, low educational attainment, high unemployment, jobs in relatively unskilled occupations and variables that broadly reflect disadvantage rather than measuring specific aspects of disadvantage. At the advantage end of the scale, households with high incomes, high education levels, large dwellings, high numbers of motor vehicles, spare bedrooms and professional occupations contribute to a higher score.

The key indicator in Table 4-3 is the SEIFA index which is the relative indicator of socioeconomic advantage/disadvantage. The SEIFA index for Brimbank is lower than the Victorian average indicating that the population in this area may form a vulnerable group to the effects of air pollution and noise from the Airport expansion.

Table 4-3 summarises the socioeconomic status (SES) of the Brimbank LGA population.

Table 4-3: Socio-Economic Factors – Brimbank and Victoria

Socio-Economic Factors	Brimbank	VIC
Unemployment (%) – PHIDU – June 2020	9.4%	5.4%
SEIFA Index of Relative Socio-economic Disadvantage (Index score based on Australian score of 1000) – PHIDU – June 2016	921	1010
Proportion of low-income households – PHIDU – June 2016	48.9%	40.9%
People who left school at year 10 or below, or did not go to school (Age standardized rate per 100) - PHIDU - 2016	31.2	26.0
Estimated number of people aged 18 years and over who, in the past 12 months, felt that they had experienced discrimination or have been treated unfairly by others (ASR per 100) - PHIDU - 2014	18.7	17.4

Source: PHIDU.

4.4 Health Risk Assessment

4.4.1 Issues Identification

The current State of Knowledge on the adverse health effects of aircraft noise indicates that there are impacts of the current and proposed operations of the airport on the exposed community in Brimbank. The impact of the current operations on the local community as identified during the stakeholder engagement process includes sleep disturbance and anxiety and depression. These are occurring at current flight numbers which are going to increase with the proposed Airport expansion and third runway. Residents stated that they are unable to enjoy the outdoor areas of their homes and the open space in Brimbank, such as Brimbank Park, due to aircraft noise. This is predicted to be worse with the proposed Airport expansion and impact across a larger proportion of the Brimbank LGA. The HRA presented in the following sections, where possible, quantifies the potential impact on the Brimbank community from the aircraft noise predicted for the Airport expansion.

4.4.2 Hazard Assessment

In recent years, evidence has accumulated regarding the health effects of environmental noise. The main health effects associated with environmental noise are:

- Annoyance;
- Sleep disturbance;
- Increase in ischaemic heart disease;
- Cognitive impairment; and
- Psychological effects including anxiety and depression.

An increasing body of literature has shown traffic noise, including aircraft noise, to have adverse short- and long-term health effects (Babisch 2006; Berglund et al. 1999; Bluhm et al. 2007; Stansfeld et al. 2000, 2005). One of the suggested mechanisms by which noise affects non-auditory health is through indirect or direct activation of the sympathetic nervous system and endocrine systems (Ising and Kruppa 2004; Stansfeld and Matheson 2003), resulting in autonomic reactions, including increased blood pressure, heart rate, and arrhythmia (Berglund et al. 1999). Therefore, research has focused on the impact of transportation noise on cardiovascular health.

4.4.2.1 Annoyance

Annoyance is the most prevalent community response in a population exposed to environmental noise. It is not in itself considered to be a health effect (WHO, 2018, 2009; enHealth, 2018, 2004). The term annoyance is used to describe negative reactions to noise such as disturbance, irritation, dissatisfaction and nuisance (Guski, 1999). Annoyance can also be accompanied by stress-related symptoms, leading to changes in heart rate and blood pressure. Acoustic factors, such as the noise source and sound level, account for only a small to moderate amount of annoyance responses: other factors such as the fear associated with the noise source, interference with activities, ability to cope, noise sensitivity, expectations, anger, attitudes to the source – both positive or negative, and beliefs about whether noise could be reduced by those responsible, all influence annoyance responses (WHO, 2000).

The noise metrics associated with adverse health effects are Lden and Lnight. Lden is a weighted measure of day, evening and night noise levels while Lnight is the noise level experienced between 11pm and 6am. Both are annual averages. Exposure to aircraft noise at 60 dB Lden is estimated to be associated with 38% of the population reporting being “annoyed” and 17% being “highly annoyed” (EC, 2002). Exposure to aircraft noise at 65 dB Lden is estimated to be associated with 48% of the population reporting being “annoyed” and 26% being “highly annoyed” (EC, 2002). However,

several studies have suggested that aircraft noise annoyance around major airports in Europe has increased (Babisch et al., 2009; Janssen et al., 2011; Schreckenberg et al., 2010) indicating that the percentage of the population reporting being "annoyed" or "highly annoyed" at each noise exposure level may have increased since these figures were put forward by the European Commission in 2002 (EC, 2002).

Annoyance responses can also increase in relation to a change in airport operations. A study around Zurich airport found that residents who experienced a significant increase in aircraft noise exposure due to an increase in early morning and late evening flight operations had a pronounced over-reaction of annoyance i.e. the annoyance reaction was greater than that which would be predicted by the level of noise exposure (Brink et al., 2008).

Children also report annoyance responses, although it is not known at what age children begin to exhibit annoyance responses. The RANCH study found that children aged 9-11 years of age living near London Heathrow, Amsterdam Schiphol, and Madrid Barajas airports, reported annoyance for aircraft noise exposure at school and at home (van Kempen et al., 2009). For school exposure the percentage of "highly annoyed" children increased from about 5.1% at 50 dB LAeq 16 hour, to 12.1% at 60 dB LAeq 16 hour.

4.4.2.2 Sleep Disturbance

Possible effects of noise on sleep are generally grouped into three categories:

- The immediate effects of noise on sleep (sleep disturbance and physiological effects)
- The secondary effects of sleep disturbances (morning after effects)
- Long term health effects.

Sleep disturbance is defined as any deviation, measurable or subjectively perceived, from an individual's habitual or desired sleep behaviour. This may include awakenings, sleep quality, medication use to control sleep, total sleep time, time spent in slow wave sleep, arousals and time spent in rapid eye movement sleep (WHO, 2009).

The WHO estimated sleep disturbance to be the most adverse non-auditory effect of environmental noise exposure (Basner et al., 2014; WHO, 2011). Undisturbed sleep of a sufficient number of hours is needed for alertness and performance during the day, for quality of life, and for health (Basner et al., 2014). Humans exposed to sound whilst asleep still have physiological reactions to the noise which do not adapt over time including changes in breathing, body movements, heart rate, as well as awakenings (Basner et al., 2014). The elderly, shift-workers, children and those with poor health are thought to be at risk for sleep disturbance by noise (Muzet, 2007).

The effect of night-time aircraft noise exposure has been explored for a range of sleep outcomes ranging from subjective self-reported sleep disturbance and perceived sleep quality, to more objective measures of interference with ability to fall asleep, shortened sleep duration, awakenings, and increased bodily movements as assessed by polysomnography (Michaud et al., 2007). Most evidence comes from studies of self-reported sleep disturbance. However, self-reported sleep disturbance outcomes are vulnerable to bias, as such measures are likely to be influenced by noise annoyance and other demographic factors (Clark and Stansfeld, 2011).

Reviews have concluded that there is evidence for an effect of night-time aircraft noise exposure on sleep disturbance from community based studies (Hume et al., 2012; Miedema & Vos, 2007). However, some reviews have concluded that the evidence is contradictory and inconclusive (Jones, 2009; Michaud et al., 2007), which might be explained by methodological differences between studies of noise effects on sleep disturbance. A meta-analysis of 24 studies, including nearly 23,000 individuals exposed to night-time noise levels ranging from 45-65 dBA, found that aircraft noise was associated with greater self-reported sleep disturbance than road traffic noise (Miedema and Vos,

2007). However, another study, whilst confirming that aircraft noise was associated with greater self-reported sleep disturbance than road traffic noise, found that when [2]polysomnography measures of sleep disturbance were analysed, that road traffic noise was associated with greater disturbance than aircraft noise (Basner et al., 2011).

There is evidence that aircraft noise influences the time spent in different sleep stages, with aircraft noise reducing slow-wave sleep (NREM Stage 4) and REM sleep and increasing NREM Stages 1, 2 & 3 (Basner et al., 2008; Swift, 2010). This evidence, taken with the increase in REM sleep in the later stages of the night might have implications for early morning (04.00-06.30 hours) flight operations at airports.

A laboratory study compared the potential effects of changes in the night-time curfew at Frankfurt airport on sleep disruption (Basner and Siebert, 2010), using polysomnography on 128 subjects over 13 nights. Three different operational scenarios were compared: scenario 1 was based on 2005 air traffic at Frankfurt airport which included night flights; scenario 2 was as scenario 1 but cancelled flights between 23.00-05.00 hours; scenario 3 was as scenario 1 but with flights between 23.00-05.00 hours rescheduled to the day-time and evening periods. The study found that compared to the night without a curfew on night flights (scenario 1), small improvements were observed in sleep structure for the nights with curfew, even when the flights were rescheduled to periods before and after the curfew period. However, the change in the amount of time spent in the different sleep stages for the different scenarios was small, which might be explained by the small number of night-flights (on average 4 take-offs per hour) in the Frankfurt airport scenarios examined - larger effects may be observed for airports with a greater number of night-flights. The authors concluded that the benefits for sleep seen in the scenario involving rescheduling of flights rather than cancellation may be offset by the expected increase in air traffic during the late evening and early morning hours for those who go to bed before 22.30 or after 01.00 hours.

The WHO Europe Night Noise Guidelines (WHO, 2009) were based on expert-consensus that there was sufficient evidence that nocturnal environmental noise exposure was related to self-reported sleep disturbance and medication use, and that there was some evidence for effects of nocturnal noise exposure on high blood pressure (hypertension) and heart attacks. The WHO Noise Guidelines (2018) state that the target for night noise exposure from aircraft should be 40 dB Lnight, outside. The WHO note that meeting this guideline may not protect vulnerable groups such as the elderly, children, and the chronically ill from the effects of aircraft noise at night on health.

There have been fewer studies on aircraft noise exposure and sleep in children (Stansfeld and Clark, 2015), even though children are a group thought to be vulnerable to the effects of sleep disturbance (Pirrera et al., 2010). Children sleep outside the typical hours used to denote night-time noise exposure around airports (e.g. Lnight is typically 23.00 hours to 07.00 hours), so exposures during the hours of the evening and morning, which would fall within day-time exposure metrics may also be relevant when considering sleep disturbance effects for children.

4.4.2.3 Cardiovascular Disease

In recent years, evidence that aircraft noise exposure leads to increased risk for poorer cardiovascular health has increased considerably. A recent review, suggested that risk for cardiovascular outcomes such as high blood pressure (hypertension), heart attack, and stroke, increases by 7 to 17% for a 10 dB increase in aircraft or road traffic noise exposure (Basner et al., 2014). A review of the evidence for children concluded that there were associations between aircraft

[2] Polysomnography records biophysiological changes that occur during sleep, including brain waves using electroencephalography (EEG), eye movements using electroculography (EOG), muscle activity using electromyography (EMG), and heart rhythm using electrocardiography (ECG).

noise and high blood pressure (Paunović et al., 2011), which may have implications for adult health (Stansfeld and Clark, 2015).

The HYENA study (HYpertension and Exposure to Noise near Airports) examined noise effects on the blood pressure (hypertension) of 4,861 people, aged 45-70 years, who had lived for over five years near seven major European airports including London Heathrow; Amsterdam Schiphol; Stockholm Arlanda and Bromma; Berlin Tegel, Milan Malpensa; and Athens Eleftherios Venizelos (Jarup et al., 2008). High blood pressure was assessed via measurements and medication use. The HYENA study found that a 10 dB increase in aircraft noise at night (Lnight) was associated with a 14% increase in risk for high blood pressure but day-time aircraft noise (LAeq 16 hour) did not increase the risk for high blood pressure (Jarup et al., 2008). The HYENA study did not find an association between day-time aircraft noise and high blood pressure which might be because many residents work away from home during the day-time, leading to potential mis-classification of their day-time aircraft noise exposure. The HYENA study also found that a 10 dB increase in night-time aircraft noise was associated with a 34% increase in the use of medication for high blood pressure in the UK (Floud et al., 2011). The HYENA study is a high quality large-scale study of aircraft noise exposure effects on blood pressure, which includes a population sample around London Heathrow airport.

A further study conducted as part of the HYENA project demonstrated an association between noise and cardiovascular disease risk factors (Floud et al., 2013). The results are consistent with the hypothesis that noise exposure provokes a stress response causing a release of stress hormones, which in turn affect factors such as blood pressure and heart rate and thus cardiovascular disease risk. Night-time aircraft noise was statistically significantly associated with self-reported heart disease and stroke but was reduced and became non-significant after adjustment for confounders. However, there was a significant association for those who had lived for 20 years or more at their current address and aircraft noise. A statistically significant association (25 % increase in risk) was found between exposure to night-time aircraft noise and heart disease and stroke in people who had lived in the same home for 20 years or more, and this association was robust to adjustment for exposure to NO_2 air pollution.

A study around London Heathrow airport examined risks for hospital admission and mortality for stroke, coronary heart disease and cardiovascular disease for around 3.6 million people living near the airport (Hansell et al., 2013). Both day-time (LAeq 16 hour) and night-time (Lnight) aircraft noise exposure were related to increased risk for a cardiovascular hospital admission. Compared to those exposed to aircraft noise levels below 51 dB in the day-time LAeq, 16 hour, those exposed to aircraft noise levels over 63 dB LAeq, 16hour in the day-time had a 24% higher chance of a hospital admission for stroke; a 21% higher chance of a hospital admission for coronary heart disease; and a 14% higher chance of a hospital admission for cardiovascular disease. These estimates took into account age, sex, ethnicity, deprivation and lung cancer mortality as a proxy for smoking. These results were also not accounted for by air pollution, which was adjusted for in the analyses. Similar effects were also found between aircraft noise exposure and mortality for stroke, coronary heart disease, and cardiovascular disease. The study concluded that high levels of aircraft noise were associated with increased risks of stroke, coronary heart disease, and cardiovascular disease for both hospital admissions and mortality in areas near Heathrow airport.

Further longitudinal evidence for an association between aircraft noise exposure and mortality from heart attacks comes from a large-scale Swiss study of 4.6 million residents over 30 years of age (Huss et al., 2010). This study found that mortality from heart attacks increased with increasing level and duration of aircraft noise exposure (over 15 years), but there were no associations between aircraft noise exposure and other cardiovascular outcomes including stroke or circulatory disease. The lack of association between aircraft noise and stroke differs from the findings of the similar study conducted by Hansell et al., (2013) around Heathrow airport, which did find an association of aircraft noise on stroke mortality.

A multi-airport retrospective study of approximately 6 million older people residing near airports in the United States (Correia et al., 2013) found that averaged across all airports and using the 90th centile noise exposure metric, a zip code with 10 dB higher noise exposure had a 3.5% higher (95% confidence interval 0.2% to 7.0%) cardiovascular hospital admission rate, after controlling for covariates. Despite limitations related to potential misclassification of exposure, a statistically significant association between exposure to aircraft noise and risk of hospitalization for cardiovascular diseases among older people living near airports was observed. The most recent meta-analysis of the field (Babisch, 2014) concluded that aircraft noise exposure was associated with increased risk for cardiovascular outcomes such as high blood pressure, heart attack and stroke.

It is biologically plausible that long-term exposure to environmental noise might influence cardiovascular health (Babisch, 2014). The proposed pathways between environmental noise exposure and cardiovascular diseases (Babisch, 2014) include increased stress associated with noise exposure that might cause physiological stress reactions in an individual, which in turn can lead to increases in established cardiovascular disease risk factors such as blood pressure, blood glucose concentrations, and blood lipids (blood fats). These risk factors lead to increased risk of high blood pressure (hypertension) and arteriosclerosis (e.g. narrowing of arteries due to fat deposits) and are related to serious events such as heart attacks and strokes (Babisch, 2014; Basner et al., 2014). The stress that triggers this pathway can operate directly via sleep disturbance or indirectly via interference with activities and annoyance.

To date, few studies have examined whether aircraft noise exposure influences metabolic risk factors for cardiovascular health, such as Type II diabetes, body mass index, and waist circumference. Such factors would lie on the proposed pathway between aircraft noise exposure and cardiovascular diseases. A study of long-term exposure to aircraft noise in Sweden found that exposure was associated with a larger waist circumference but less clearly with Type II diabetes and body mass index (Eriksson et al., 2014). Further studies are required to investigate these associations.

4.4.2.4 Children's Learning and Cognitive Development

Children may be particularly vulnerable to the effects of noise because they may have less cognitive capacity to understand environmental issues and anticipate stressors and they may lack appropriate coping strategies to deal with noise. Additionally, noise may interfere with learning at a critical developmental stage.

The impact of environmental noise on children's learning and memory has been known for many years. Epidemiological studies show effects of chronic noise exposure on tasks involving central processing and language, such as reading, comprehension, memory and attention. Experimental studies investigating acute (short-term) exposures have found similar effects. Exposure during critical periods of learning at school could potentially impair development and have a lifelong effect on educational attainment.

There are several ways in which aircraft noise could influence children's cognition (Stansfeld and Clark, 2015):

- lost teaching time - as a teacher may have to stop teaching whilst noise events occur;
- teacher and pupil frustration;
- annoyance and stress responses;
- reduced morale;
- impaired attention;
- children might tune out the aircraft noise and over-generalise this response to other sounds in their environment missing out on information; and

- sleep disturbance from home exposure which might cause performance effects the next day.

Many studies have found effects of aircraft noise exposure at school or at home on children's reading comprehension or memory skills (Evans and Hygge, 2007). The RANCH study (Road traffic and Aircraft Noise and Children's Cognition and Health) of 2844 9-10 year old children from 89 schools around London Heathrow, Amsterdam Schiphol, and Madrid Barajas airports found that aircraft noise was associated with poorer reading comprehension and poorer recognition memory, after taking socioeconomic factors and road traffic noise into account (Stansfeld et al., 2005).

The exposure-response relationship between aircraft noise at school and reading comprehension from the RANCH study (Clark et al., 2006), showed that as aircraft noise exposure increased, performance on the reading test decreased. Reading began to fall below average at around 55 dB LAeq 16 hour at school. The development of cognitive skills such as reading and memory is important not only in terms of educational achievement but also for subsequent life chances and adult health (Kuh and Ben-Shlomo, 2004). In the UK, reading age was delayed by up to 2 months for a 5 dB increase in aircraft noise exposure (Clark et al., 2006). The UK primary schools in the RANCH study ranged in aircraft noise exposure from 34 dB LAeq 16 hour to 68 dB LAeq 16 hour. The study found that a 20 dB difference in aircraft noise exposure between schools would result in an 8-month difference in reading age.

In the RANCH study, for primary school children, aircraft noise exposure at school and at home were very highly correlated: in the RANCH UK sample, this correlation was r=0.91 (Clark et al., 2006). Such a high correlation makes estimating the impact of aircraft noise exposure in both environments difficult. The RANCH study found that night-time aircraft noise at the child's home was also associated with impaired reading comprehension and recognition memory, but night-noise was not having an additional effect to that of day-time noise exposure on reading comprehension or recognition memory (Clark et al., 2006; Stansfeld et al., 2010). These findings suggest that indices of aircraft noise exposure in the day-time in the school environment should be sufficient to capture effects. Further analyses of the UK RANCH sample found that these associations for aircraft noise exposure remained after controlling for air pollution effects (Clark et al., 2012).

A further study investigating the effects of aircraft noise around Heathrow Airport in the home environments on children's cognition found a significant dose-response relationship between aircraft noise at home and performance on memory tests of immediate and/or delayed recall (Matsui et al., 2004). The study found no associations with other cognitive outcomes.

Two studies of interventions to reduce or remove aircraft noise exposure at school have been conducted. The longitudinal Munich Airport study (Hygge et al., 2002) found that prior to the relocation of the airport in Munich, high noise exposure was associated with poorer long-term memory and reading comprehension in children aged 10 years. Two years after the airport closed these cognitive impairments were no longer present, suggesting that the effects of aircraft noise on cognitive performance may be reversible if the noise stops. In the cohort of children living near the newly opened Munich airport impairments in memory and reading developed over the following two years.

A study of 6,000 schools exposed between the years 2000-2009 at the top 46 United States airports, (exposed to Day-Night-Average Sound Level of 55 dB or higher) found significant associations between aircraft noise and standardised tests of mathematics and reading, after taking demographic and school factors into account (Sharp et al., 2014). In a sub-sample of 119 schools, they found that the effect of aircraft noise on children's learning disappeared once the school had sound insulation installed.

Schools located near airports often also experience high levels of road traffic noise but it is important to note that aircraft noise exposure still influences children's learning, even if road traffic

noise exposure is high. The results presented for the RANCH study are the association for aircraft noise exposure, after taking road traffic noise into account (Clark et al., 2006).

A study conducted by Haines et al. (2002) studied a sample of approximately 11,000 11 year old children from 123 schools surrounding Heathrow Airport. The results of the study showed that chronic exposure to aircraft noise was significantly related to poorer reading and mathematics performance. However, after control for socioeconomic factors these associations were no longer statistically significant.

Children spend a considerable amount of time at school in the playground. Play is thought to be important for children's social, cognitive, emotional and physical development, as well as enabling relaxation between more formal teaching activities. The WHO (1999) established a community noise guideline of 55 dB for school playgrounds, during play, to protect against these effects.

It has been suggested that long-term noise exposure might influence psychological health in children. However, overall, the evidence for aircraft noise exposure being linked to poorer well-being, lower quality of life, and psychological ill-health is not as strong or consistent as for other health outcomes, such as cardiovascular disease. A recent study of 2300 residents near Frankfurt Airport found that annoyance but not aircraft noise levels per se (LAeq16 hour, Lnight, Lden) was associated with self-reported lower quality of life (Schreckenberg et al., 2010).

Several studies of children around London Heathrow Airport have shown no effect of aircraft noise at school on children's psychological health or cortisol levels (Haines et al., 2001a; Haines et al., 2001b; Stansfeld et al., 2009) - cortisol levels are known to be raised in children with depression. However, there may be a small effect of aircraft noise on hyperactivity symptoms. The West London Schools Study of 451 children around Heathrow airport, aged 8-11 years found higher rates of hyperactivity symptoms for children attending schools exposed to aircraft noise levels >63 dB LAeq 16 hour compared with <57 dB LAeq 16 hour (Haines et al., 2001a). A similar effect was observed in the RANCH study where a 10 dB LAeq 16 hour increase in aircraft noise exposure at school was associated with 0.13% increase in hyperactivity symptoms (Stansfeld et al., 2009). However, these increases in hyperactivity symptoms, whilst statistically significant, are extremely small and most likely not of clinical relevance. Aircraft noise exposure does not appear to be causing children to develop hyperactivity problems.

4.4.2.5 Psychological Effects

The health effects linked to aircraft noise exposures have been well studied and reviewed by international researchers and institutions (Baudin et al., 2018; Clark et al., 2011, 2020; Hegewald et al., 2020; Lee et al., 2021; Li et al., 2020; Wright et al., 2018). Most information comes from population-based epidemiological studies that find increases in cognitive disorders, depression, and sleep deprivation, with a particular negative impact on recognition memory and conceptual recall memory in school-aged children.

Several studies conducted in Europe have examined the adverse effects of aircraft noise on annoyance due to aircraft noise and noise sensitivity (Baudin et al., 2018), and self-assessed mental ill health with even minor increases in decibels (Wright et al., 2018). A slight increase in decibels in the UK study indicated that a minor difference, from <54dB up to ≥57 dB, was impactful in mental ill heath by approximately 3% (low noise 9.7% vs high noise 12.4%, respectively). Furthermore, associated to mental health, multiple studies attributed increases in population anxiety and depression to aircraft noise pollution, with a 12% increase in depression (and anxiety) per 10 dB in Lden from aircraft noise exposure (Hegewald et al., 2020) being reported.

These health effects from aircraft noise pollution have a significant impact on children, more so related to night-waking, and the cognitive developmental and sleep-related issues in children. Aircraft noise is more intermittent than road traffic, and studies found more intermittent disruptions

during sleep, even if at lower decibels, are more impactful on sleep in children. Chronic exposure to aircraft noise for children are associated with high levels of annoyance, perceived stress, poor reading comprehension, poor information and comprehension recall, and less sustained attention. Furthermore, an extended 18-month exposure to aircraft noise found a significant decline in the psychological health of children. Children with high levels of noise sensitivity are more likely to suffer from sleep anxiety and parasomnias when impacted by aircraft noise (Clark et al., 2012; Lee et al., 2021).

The HYENA study found that a 10 dB increase in day-time (LAeq 16 hour) noise exposure was associated with a 28% increase in anxiety medication use in adults. Similarly, a 10 dB increase in night-time (Lnight) aircraft noise was associated with a 27% increase in anxiety medication use. However, day-time and night-time aircraft noise exposure were not associated with sleep medication or anti-depressant medication use (Floud et al., 2011). Anxiety medication is prescribed for individuals experiencing levels of anxiety and worry that interfere with their ability to function effectively: they can also be prescribed for sleeping problems. A sub-study of the HYENA study found that salivary cortisol (a stress hormone which is higher in people with depression) was 34% higher for women exposed to aircraft noise > 60 dB LAeq 24 hour, compared to women exposed to less than 50 dB LAeq 24 hour (Selander et al., 2009). However, no association between aircraft noise and salivary cortisol was found for men.

A study by Beutel et al (2016) found that strong noise annoyance due to environmental noise was associated with a two-fold higher prevalence of anxiety and depression in a study of 15,100 adults in Germany living near Frankfurt Airport. When other compared to other sources of noise, such as road traffic noise, aircraft noise affected approximately 60% of the study population and was much more prominent in the study responses for annoyance as well as depression and anxiety. A further study in France found similar results (Baudin et al, 2018). Aircraft noise was associated with in annoyance in a study of 1244 adults. The increase in annoyance was associated with increases in psychological health such as anxiety and depression. Older members of the population may be more vulnerable to the impacts of aircraft noise on depression and anxiety as they have lower residential mobility, spend more time at home and may have higher sensitivity to environmental influences on sleep disturbance and annoyance (Li et al, 2020).

The link between green space in cities and their benefit for mental health is well documented. A study by Engemenn et al (2019) covering >900,000 people found that that children who grew up with the lowest levels of green space had up to 55% higher risk of developing a psychiatric disorder independent from effects of other known risk factors. The association remained even after adjusting for urbanization, socioeconomic factors, parental history of mental illness, and parental age. Stronger association of cumulative green space presence during childhood compared with single-year green space presence suggests that presence throughout childhood is important.

The benefits of green space for health and wellbeing have long been recognised (Maas et al. 2006, Mitchell and Popham 2008, Groenewegen et al. 2006). The positive link between green space and health and wellbeing is most apparent among the elderly, people who spend most of their time at home, and those from lower socioeconomic groups (De Vries et al. 2003). However, people of all ages and socioeconomic status can benefit from exposure to green space and views of nature (Groenewegen et al. 2006). Residents of neighbourhoods with abundant green space tend to enjoy better general health (Maas et al. 2006). Neighbourhoods with comparatively more walkable green space have been correlated with a lower mortality risk (Takano et al. 2002). The percentage of green space in people's living environments, and its proximity to people's homes, are positively associated with self-perceived health (Maas et al. 2006). Contact with green space has been found to be 'restorative', both psychologically and physiologically, reducing blood pressure and stress levels (Hartig et al. 2003, Pretty et al. 2005) and potentially promoting faster healing from surgery (Ulrich 1984). Increased green space can also promote physical activity (Kaczynski and Henderson 2007).

Undertaking physical activity in the natural environment may have greater psychological and physiological benefit than physical activity in other settings (Pretty et al. 2005). The findings of these studies show the importance of green spaces such as Brimbank Park on community health and well-being.

4.4.3 Exposure Assessment

The predicted noise levels presented in the Master Plan are the ANEF contours. The metrics used in the Health Risk Assessment done as part of the Master Plan are the metrics specified by AS2021-2015 which are based on amenity impacts not health impacts. These do not take into account the most recent information on the health effects of noise that has been considered by enHealth and WHO in the update of their noise guidelines in 2018. The Master Plan refers to enHealth 2004 and the guidelines incorporated in that document but not to the updated values recommended by enHealth in 2018. The values used in the HRA conducted as part of the Master Plan are not consistent with the metrics recommended by the WHO (2018) to assess the potential health effects of noise. The WHO guidelines have been developed to protect against long-term exposure to aircraft noise and are expressed as an annual average.

To generate the relevant health metrics T+T engaged Marshall Day Associates to convert the ANEF values to Lden and Lnight values. Lden is a weighted measure of day, evening and night noise levels while Lnight is the noise level experienced between 11pm and 7am. Both are annual averages. The Marshall Day report is in Attachment 1.

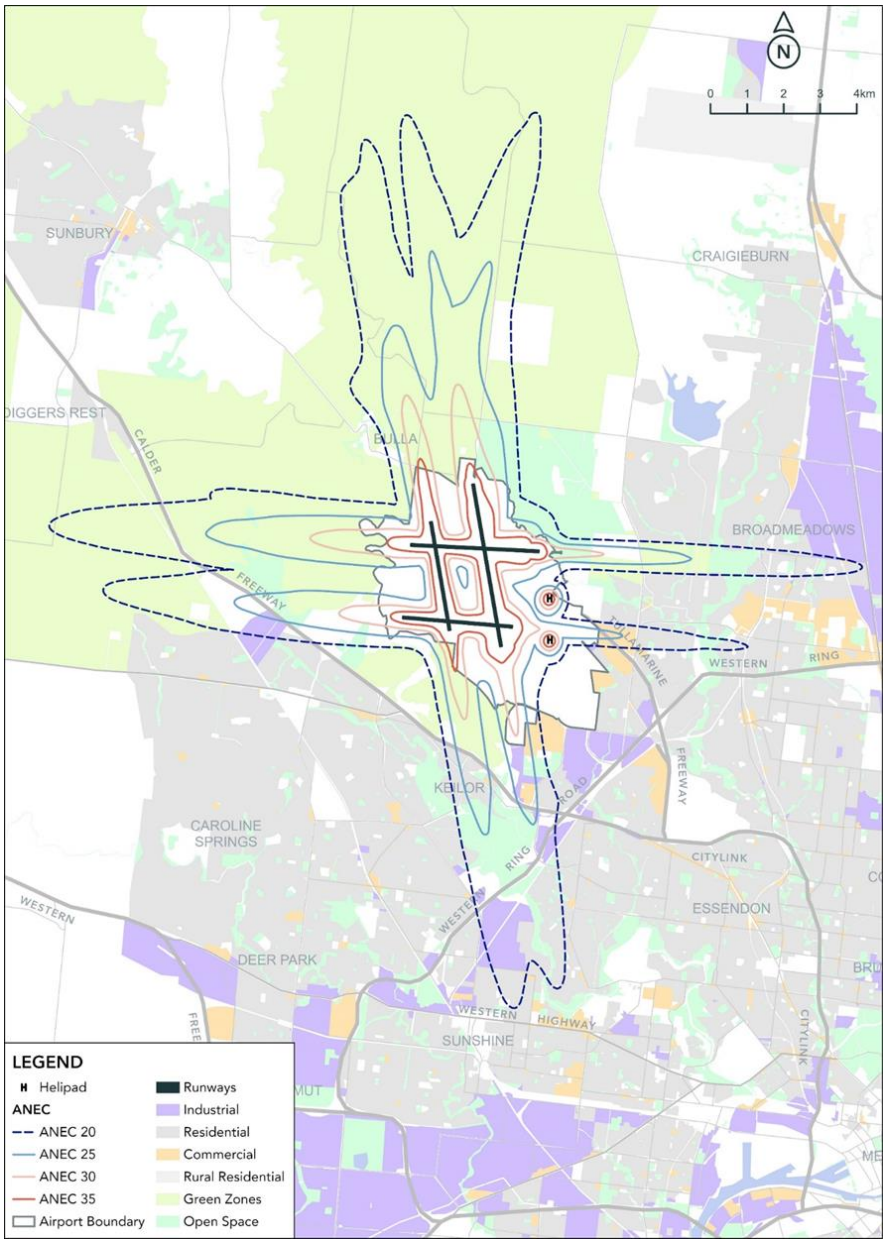
Marshall Day used data from various airports in Australia and New Zealand for which they had noise modelling data to derive the association between the ANEF contours and the Lden and Lnight metrics. The results of their analysis is shown in Table 4-4:

Table 4-4: Correlation between ANEF values and Lden and Lnight metrics

ANEF	Lden (dB)	Lnight (dB)
ANEF 20	61	53
ANEF 25	66	58
ANEF 30	71	67
ANEF 35	76	68

The draft ANEF contours for the 2022 Master Plan provided to Brimbank City Council by Melbourne Airport is shown in Figure 4-1.

Figure 4-1: Draft ANEF Contours 2022 Melbourne Airport Master Plan



As can be seen from Figure 4-1, the ANEF 20 contour extends as far south as Sunshine North and covers parts of the suburbs of Keilor, Keilor Park, and Kealba. Parts of Keilor and Keilor Park are also included in the ANEF 25 contour. According to the correlations shown in Table 4-4, the annual average noise levels in these areas as Lden and Lnight range between 61 to 66 dB and 53 to 58 dB respectively. These predicted values due to the airport expansion are 16 to 21 dB and 13 to 18 dB above the WHO Lden and Lnight guidelines respectively. The greater area covered by the ANEF 20 and ANEF 25 contours is due to the increased numbers of flights predicted with the airport expansion.

According to the Commonwealth Department of Infrastructure (DOI, 2016) at the 20 ANEF level, it is estimated that approximately 11 per cent of people will be seriously affected by aircraft noise and approximately 45 per cent of people moderately affected by aircraft noise. At the 15 ANEF level, approximately 8 per cent of people will be seriously affected by aircraft noise and approximately 34

per cent of people moderately affected. The DOI report also states that while the populations with the highest aircraft noise exposure often live within the 20 ANEF contour, experience shows the majority of noise complaints that are received come from residents living outside the 20 ANEF contour. Traditionally the residents of these areas have been given little information on aircraft noise through the ANEF system other than that the area is considered 'acceptable' for housing. Some people living outside the 20 ANEF contour have been given an expectation of receiving little or indeed no aircraft noise and as a consequence find the levels of noise actually experienced to be unacceptable. It also notes that there is a range of research pointing to the negative health impacts of sleep disturbance and the ANEF gives only limited recognition to the impact of night–time aircraft noise. The National Acoustics Laboratory (1982) study of aircraft noise which is the basis of the ANEF metric suggested that an ANEF value of 20 could be regarded as an 'excessive' amount of aircraft noise.

The population and predicted population growth in these suburbs between 2016 and 2046 are shown in Table 4-5:

Table 4-5: Population data and Predicted Population Growth 2016 – 2046 in Suburbs within the ANEF 20 and ANEF 25 contours Brimbank LGA.

Suburb	2016	2021	2026	2031	2036	2041	Total Change in Population	Annual Average % Increase in Population
Kealba	3,364	3,328	3,338	3,379	3,436	3,496	+132	+0.15
Keilor	6,157	6,366	6,653	6,827	7,009	7,189	+1,032	+0.62
Keilor Park and District	2,886	2,916	2,984	3,052	3,120	3,191	+305	+0.40
Sunshine North	12,123	13,242	15,439	17,533	19,437	21,266	+9,143	+2.27
TOTAL	24,530	25,852	28,414	30,791	33,002	35,142	11,629	+3.8

The data in Table 4-4 show that in 2016 there were 24,530 people living in the suburbs of Kealba, Keilor, Keilor Park and District and Sunshine North which is predicted to increase to 35,142 people by 2041. The ANEF 20 and 25 contours do not cover the entirety of these suburbs. Using the ANEF contours produced by Melbourne Airport Corporation the ANEF 20 contour covers approximately 20% Kealba, 65% Keilor, 60% Keilor Park, 40% Sunshine North. These percentages have been used to estimate the population within these suburbs within the ANEF 20 contour with the proposed expansion. In 2016 there was 11,256 people estimated to be living within the ANEF 20 contour predicted to grow to 15,745 in 2041.

According to the 2016 Census Data, shown in Table 4-1, between 12.5 and 26% of the population in these suburbs were 65 years of age or older and between 17 and 18% were children aged 1-14 years. Both these age groups are more sensitive to the effects of environmental noise including aircraft noise. Based on this data and the population data shown in Table 4-4, in 2016 there would up to 10,792 people in the affected suburbs in Brimbank that would fall into groups that are known to be sensitive to the effects of aircraft noise. This is predicted to increase to 15,463 people in 2041.

In these suburbs there are 8 schools and childcare/early learning centres as well as 4 aged care facilities/retirement villages.

It is generally acknowledged that the significance of the noise level change values are as follows:

- Differences in noise levels of less than approximately 2 dB are generally imperceptible in practice, an increase of 2 dB is hardly perceivable;
- Differences in noise levels of around 5 dB are considered to be clearly perceptible; and
- Increases in noise levels of around 10 dB are generally perceived to be a doubling of the perceived loudness of the noise. An increase of 10 dB is perceived as twice as loud. Therefore, an increase of 20 dB is four times as loud and an increase of 30 dB is eight times as loud etc.

4.4.4 Risk Characterisation

The purpose of the risk characterization is to estimate potential risks associated with exposure to noise from the proposed airport operations. For the assessment of health effects where there is a known threshold for effect, the predicted noise level for each averaging period is compared to the health based guideline values as set by WHO (2018). The ratio of the predicted noise level to the guideline is termed the hazard quotient (HQ):

HQ = predicted noise level / health based guideline

The hazard quotients are estimated for each of the averaging periods relevant to the guidelines for a given health outcome. The hazard quotient approach has been used to assess the potential impact on sleep disturbance and children's learning and cognitive development. It has also been used to assess the increase in risk for people highly annoyed by aircraft noise. The WHO guideline for Lden has been based on the number of people who are highly annoyed which occurs at lower noise levels than other health impacts such as increases in cardiovascular outcomes. Therefore, meeting the WHO guideline for annoyance means that other health outcomes will be protected.

It is accepted by health authorities, including enHealth and WHO, that a hazard quotient of 1 or below is an acceptable risk level. Hazard quotients greater than 1 indicate an increase in risk of adverse health effects and that risk management measures should be considered to minimize risk to acceptable levels.

4.4.4.1 Annoyance

The WHO (2018) reviewed the epidemiological literature relating to the impacts of aircraft noise and percentage of people in a population highly annoyed by noise. The association determined by WHO is shown in Table 4-6. Using the correlations determined by Marshall Day, the ANEF 20 contour corresponds to a Lden value of 61 dB which indicates that 36% of the population within the ANEF 20 contour would be highly annoyed by noise. Forty five percent of the population living within the ANEF 25 contour would be highly annoyed by noise.

WHO derived a guideline value of 45 dB to be protect the population from being highly annoyed by aircraft noise and other adverse health effects such as increases in cardiovascular disease. The WHO acknowledge that at this level there would still be 10% of the population highly annoyed by noise.

The ANEF 25 contour extends across the suburbs of Keilor, Keilor Park, Keilor Village and parts of Kealba. This means that 45% of the population within this contour would be highly annoyed by the aircraft noise. The hazard quotient is 1.5 which is a 50% increase in the population impacted compared with areas that would meet the WHO guideline. As the WHO Lden guideline is derived to protect against increases in annoyance, cognitive development and cardiovascular effects, this would indicate that there would be increases in cardiovascular disease within that population in

addition to annoyance and potentially impacts on cognitive development. As discussed in Section 4.4.2.5, increases in the number of people highly annoyed by aircraft noise has been associated with increases in depression and anxiety in adult populations. Based on the WHO data shown in Table 4-6, in the ANEF contour 45% of the population would be highly annoyed by aircraft noise arising from the proposed Airport expansion which indicates that a significant percentage of the adult population are potentially at risk for increases in depression and anxiety.

The ANEF 20 contour extends as far south as North Sunshine. Based on the Marshall Day analysis, the hazard quotient for the population living within this contour is 1.4 – a 40% increase in people highly annoyed compared with areas that would be compliant with the WHO guideline. As shown in Table 4-4 the total population in the ANEF 20 and 25 contours is predicted to be 15,745 by 2041. Based on the WHO data shown in Table 4-6, this would indicate that approximately 6,300 people would be highly annoyed by aircraft noise in 2041.

Table 4-6: Percentage of Population Highly Annoyed by Aircraft Noise (Source: WHO, 2018)

Lden (dB)	% Highly Annoyed
40	1.2
45	9.4
50	17.9
55	26.7
60	36.0
65	45.5
70	55.5

4.4.4.2 Highly sleep disturbed (HSD)

The WHO (2018) reviewed epidemiological studies linking aircraft noise and highly disturbed sleep. The WHO estimated sleep disturbance to be the most adverse non-auditory effect of environmental noise exposure (Basner et al., 2014; WHO, 2011). Undisturbed sleep of a sufficient number of hours is needed for alertness and performance during the day, for quality of life, and for health (Basner et al., 2014). Humans exposed to sound whilst asleep still have physiological reactions to the noise which do not adapt over time including changes in breathing, body movements, heart rate, as well as awakenings (Basner et al., 2014). The elderly, shift-workers, children and those with poor health are thought to be at risk for sleep disturbance by noise (Muzet, 2007). The WHO (2018) estimated that 11% of the population are highly sleep disturbed at Lnight levels of 40dB. The % of highly sleep disturbed at levels above 40 dB are shown in Table 4-7.

Table 4-7: Percentage of Population Highly Sleep Disturbed by Aircraft Noise (Source: WHO, 2018)

Lnight (dB)	% Highly Sleep Disturbed	95% Confidence Limit
40	11.3	4.72-17.81
45	15	6.95-23.08
50	19.7	9.87-29.60
55	25.5	13.57-37.41
60	32.3	18.15-46.36
65	40	23.65-56.06

The WHO has established a Lnight guideline of 40 dB to protect against highly disturbed sleep. They acknowledge that this guideline is not fully protective of health as it implies that approximately 11% of the population may be characterized as highly sleep disturbed at the Guideline level.

As shown in Table 4-5, the ANEF 25 contour corresponds to a Lnight value of 58 dB. Based on the information in Table 4-7, this would mean that approximately 32% of the population within the ANEF 25 contour would be highly sleep disturbed. For the ANEF 20 contour, approximately 25% of the population would be highly sleep disturbed.

The hazard quotients for the ANEF 25 and ANEF 20 contours are 1.5 and 1.3 respectively. This means that there is a 50% increase in people highly sleep disturbed in the ANEF 25 contour compared to areas that meet the WHO Lnight guideline. For people living in the ANEF 20 contour the increase is 30%.

As discussed in Section 4.4.2.2, possible effects of aircraft noise on sleep are generally grouped into three categories:

- The immediate effects of noise on sleep (sleep disturbance and physiological effects)
- The secondary effects of sleep disturbances (morning after effects)
- Long term health effects including increases in cardiovascular disease and psychological effects such as anxiety and depression.

People in older age groups, > 65 years of age, and children form vulnerable groups in relation to sleep disturbance. For people over 65 years of age exposure to high levels of environmental noise, including aircraft noise can increase the prevalence of cardiovascular disease, in particular ischaemic heart disease, as well as increases in anxiety and depression. The study by Hegewald et al (2020) reported a 12% increase in depression (and anxiety) per 10 dB in Lden from aircraft noise exposure. Based on the correlations between the ANEF contours and Lden metric, in the ANEF 25 contour there is a 21 dB increase in Lden above the WHO guideline. This would indicate that there is potentially a 24% increase in anxiety and depression in the population within the ANEF 25 contour. For the ANEF 20 contour the Lden equivalent is 16 dB above the WHO guideline indicating that there could be an increase of approximately 20% in anxiety and depression in that population. As shown in Table 4-2, 27.8% of the population in Brimbank currently suffer from anxiety and depression. Table 4-2 also shows that the deaths per 100,000 population for ischaemic heart disease and cardiovascular disease are higher in Brimbank compared to the rest of Victoria. This indicates that

the Brimbank community is more vulnerable to the impacts of aircraft noise due to higher rates of existing disease that are exacerbated by exposure to noise.

For children, sleep disturbance can lead to the inability to concentrate the following day which can impact on their cognitive development as discussed in Sections 4.4.2.4 and 4.4.4.3.

4.4.4.3 Cognitive Development in Children

As discussed in Section 4.4.2.3, aircraft noise has been associated with delays in cognitive development in children. WHO (2018) identified that at a Lden level of 55 dB there is a 1 month delay in reading and oral comprehension in children compared to children in lower noise areas. For every 5 dB increase above Lden of 55 dB there is additional 1-2 month delay. The WHO Lden guideline of 45 dB is considered to be protective of adverse effects of aircraft noise on cognitive development in children. Using the 45 dB the hazard quotient for cognitive development is 1.4 and 1.5 for the ANEF 20 and ANEF 25 contours respectively.

For the areas in Brimbank within the ANEF 25 contour, this could result in a delay in reading and oral comprehension of between 3 and 5 months compared to children in lower noise areas. For the population in the ANEF 20 contour the delay is similar. This means that for children in Brimbank living and going to school within the ANEF 20 and 25 contours, the increase in noise resulting from the expansion of the Melbourne Airport as proposed in the 2022 Master Plan would have their cognitive development delayed.

As discussed in Section 4.3.2.2, the proportion of children assessed as being developmentally on track in the language and cognitive skills is notably lower in Brimbank (79.3%) than in Greater Melbourne (85.3%). Compared with other LGAs in Greater Melbourne, Brimbank had the third lowest proportion of children who were assessed as being on track for language and cognitive skills. Aircraft noise has been shown in epidemiological studies to impact on children's cognitive development particularly in reading and oral comprehension. This means that the Brimbank population forms a sensitive population to the impacts of aircraft noise from the Airport Expansion.

As shown in Section 4.4.3, approximately 18% of the population in the suburbs within the ANEF 20 and ANEF 25 contours is between the ages of 1 and 14 years of age. This indicates that there is a significant number of pre-school and school aged children that may have their cognitive development impacted by the noise from the aircraft noise from the proposed Airport Expansion. These effects are due to direct impacts during the day as well as impacts due to sleep disturbance which may occur outside the normal night hours of 11pm to 6am. Exposure during critical periods of learning at school could potentially impair development and have a lifelong effect on educational attainment.

There are several ways in which aircraft noise could influence children's cognition (Stansfeld and Clark, 2015):

- lost teaching time - as a teacher may have to stop teaching whilst noise events occur;
- teacher and pupil frustration;
- annoyance and stress responses;
- reduced morale;
- impaired attention;
- children might tune out the aircraft noise and over-generalise this response to other sounds in their environment missing out on information; and
- sleep disturbance from home exposure which might cause performance effects the next day.

The Lden metric used by WHO (2018) takes into account exposures during the day, evening and night.

As discussed in Section 4.3 there are 8 schools and childcare/early learning centres within the ANEF 20 and ANEF 25 contours. These facilities are predicted to be exposed to noise levels above the WHO guideline meaning that there is an increased risk of delays in reading and oral comprehension attributable to aircraft noise. This is likely to be worse for children who also live in these areas as they will also be exposed to aircraft noise in their home environment.

5 Risk Mitigation

Multiple airports from Australia and abroad provide examples of aircraft noise mitigation measures for the surrounding population. These mitigation measures can be separated into active and passive noise abatement measures, where active measures relate to internal changes of flight paths, flight times, and aircraft models, and passive measures are more community-focused measures.

5.1 Passive noise abatement

When active noise abatement measures cannot be implemented effectively, or at all, passive noise abatement measures can be used as a replacement. These measures can also be utilised in conjunction with active measures to further reduce airport noise pollution for surrounding communities.

5.1.1 Best Practice

European examples provide a framework for best practice measures to provide good passive noise abatement programs that assist pre-existing homes mitigate the impact of noise on the residents. A Noise Insurance Policy has been implemented by Heathrow Airport in London to compensate residents most affected by any construction and operation of the expanded airport. Heathrow implement three schemes to address differing circumstances for nearby residents:

- Scheme 1 – for eligible properties affected by aircraft noise, a full package of sound insulation to habitable rooms
- Scheme 2 – for eligible properties to address noise from construction, road, or rail sources
- Scheme 3 – a £3000 contribution to a package of sound insulation treatment

With relation to scheme 3, Heathrow plan on seeking powers to be able to carry out noise insulation works compulsorily should that be necessary for properties at the end of the new runway.

Frankfurt Airport cover nearby residents with a similar scheme, labelled the Passive Noise Protection Program, by retrofitting affected homes and properties with noise insulation materials. A budget of €150 million was allocated to the program.

During the expansion of Perth Airport, recommendations were made with respect to manageable aircraft noise levels. Approximately 35dB for sleeping areas and 40dB for living areas were accepted as complying with the requirements of *Statement of Planning Policy No. 5.1 Land Use Planning* in the Vicinity of Perth Airport. Along with the Sydney Noise Amelioration Program, these policies were considered achievable at a reasonable cost with reasonable cost-effectiveness. Some of the key measures for residential developments included:

- Openings: Maximum size of openings (windows and doors) of 20% (of floor area) for sleeping areas and 50% (of floor area) for living areas
- Construction: Slab-on-ground
- Walls: Double brick cavity
- Roof: Pitched, minimum 250 slope, masonry tiles or metal sheet with acoustically sealed sarking (impervious membrane) over rafters
- Ceiling: Plasterboard 10mm minimum thickness, with ceiling joists separate from roof structure, i.e., not attached to rafters or roof trusses
- Insulation: Fibrous thermal insulation R2.5 or greater between ceiling joists
- Windows: Laminated glass 6.38mm or greater with acoustic or resilient flap weather seals to frames

- Doors: Solid core 40mm or greater with acoustic or resilient flap weather seals to frames. Doors with glass panels are to match the standard for windows above
- Note: Where air conditioning or mechanical systems are installed, sound-attenuated ducting will be necessary to limit noise intrusion

The specifications were to be reviewed after two (2) years of operation, with noise measurements to be undertaken to evaluate the efficacy in meeting the noise reduction targets listed above.

In addition, local government provided planning and building advice involving residential developments forecast to be affect by aircraft noise exposure above 20 Australian Noise Exposure Forecast (ANEF), including:

- Potential for noise nuisance and potential for noise nuisance and increases in noise exposure levels
- Noise reduction requirements under *Statement of Planning Policy No. 5.1*
- Limitations on the required noise control measures and the potential for residual indoor sound levels more than those recommended in *AS 2021*
- Need for closure of windows and doors to achieve the benefits of noise control measures, and the associated need for noise-attenuated ventilation and/or air conditioning
- Option to seek independent professional advice as to the building specifications required to achieve the minimum aircraft noise reduction standards identified in this report
- Recommendation in *Statement of Planning Policy No. 5.1* for noise control measures in areas between the 20 ANEF and 25 ANEF contours
- Desirability of supplementary noise control measures or in circumstances where the occupants of the housing are particularly sensitive to aircraft noise.

The Victorian Planning Provisions require noise attenuation that accords with the Section 3 AS2021 – 2015, where land is located in the Melbourne Airport Environs Overlay Schedule 1 and 2 (MAEO 1 & 2). The MAEO 1 & 2 applies to the ANEF 25 and 20 respectively. The VPP's don't extract any noise attenuation requirements from Section 3 AS2021 - 2015, as opposed to the Western Australian Statement of Planning Policy No. 5.1 Land Use Planning, which includes considerable information and detail about aircraft noise and noise attenuation measures. Planning provisions are outside the scope of this HRA, however it is understood that the Victorian Government has appointed a Melbourne Airport and Environs Safeguarding Standing Advisory Committee to provide advice on safeguarding matters.

5.1.2 Previous Australian examples of insulation programs

Such passive noise abatement measures have been implemented in Australia in the past, with two key examples being the Sydney Airport Noise Amelioration Program (NAP) and the Commonwealth Noise Insulation Scheme.

The NAP was introduced in November 1994 and was developed as a program to voluntarily acquire properties and provide financial assistance for noise insulation of residential and institutional buildings in areas most affected by aircraft noise. The total expenditure was estimated to be $300 million over six financial years, and some funds were recouped using a levy on airlines and airline ticket sales. For example, between 1995 and 1997, the airlines recouped $60.8 million from an additional charge on airline tickets. The system was overseen by the Department of Transport and Regional Development; however, the business unit was sold to a private sector buyer in 1997.

The Commonwealth Noise Insulation Scheme was introduced in 2000 as a tool to insulate buildings affected by aircraft noise and was used primarily by Adelaide and Sydney airports. The scheme

provided clear guidance on which affected buildings would be targeted for assistance by utilising the Australian Noise Exposure Index (ANEI) contours:

- Residential properties: 30 ANEI contour
- Public buildings (schools, churches, day care centres and hospitals): 25 ANEI contour

The scheme was funded by a Commonwealth levy on passengers; however, the levy was terminated in 2010, with the final works beginning in 2012, and concluding by 2013. The Commonwealth scheme funded noise amelioration programs for both Sydney and Adelaide airports.

Had the Noise Insulation Scheme been in place today, all affected areas in the Brimbank LGA would be able to apply for the scheme.

6 Conclusions and Recommendations

The outcomes of the stakeholder engagement show that the residents in parts of Keilor, Keilor Park, Keilor Village and Kealba are adversely impacted by the current operations of the Melbourne Airport. Noise from aircraft take-offs and landings is causing sleep disturbance and increased levels of stress and anxiety in the impacted community. People are unable to enjoy their homes and cannot utilise their outdoor areas. This impact is predicted to worsen and affect more people in the Brimbank LGA with the proposed airport expansion. The community feel that their concerns have been dismissed by the Melbourne Airport Corporation and are feeling frustrated and helpless. This is having a significant impact on the health and wellbeing of the impacted community.

The results of the HRA have shown that the proposed airport expansion will lead to significant increases in the percentage of the population that are highly annoyed by aircraft noise. This is due to a combination of issues – larger area covered by the ANEF 20 and 25 contours with the expansion and population growth. It has also shown that there will be a significant increase in sleep disturbance in the exposed community which may lead to increases in health effects such as cardiovascular disease and anxiety and depression. The WHO (2018) guidelines are exceeded across the areas within the ANEF 20 and ANEF 25 contours indicating that there is an increased risk of adverse health effects within the exposed population.

A review of the baseline health profile and socioeconomic indicators for the Brimbank LGA show that the suburbs within the ANEF 20 and ANEF 25 contours are a vulnerable population to the impacts of aircraft noise. They have a lower socioeconomic status that Australia and Victoria as a whole which is a known risk factor for the adverse effects of aircraft noise. The proportion of children assessed as being developmentally on track in the language and cognitive skills is notably lower in Brimbank (79.3%) than in Greater Melbourne (85.3%). Compared with other LGAs in Greater Melbourne, Brimbank had the third lowest proportion of children who were assessed as being on track for language and cognitive skills. Aircraft noise has been shown in epidemiological studies to impact on children's cognitive development particularly in reading and oral comprehension. There are also higher rates of deaths from ischaemic heart and cardiovascular disease in Brimbank compared to the rest of Victoria. All these health outcomes can be exacerbated by exposure to aircraft noise.

School children who live and go to school within the ANEF 20 and ANEF 25 contours are predicted to experience a delay in reading and oral comprehension of between 3 and 5 months compared to children in lower noise areas. These effects are due to direct impacts during the day as well as impacts due to sleep disturbance which may occur outside the normal night hours of 11pm to 6am. Exposure during critical periods of learning at school could potentially impair development and have a lifelong effect on educational attainment. This impact is predicted to occur within a population that is known to be delayed in their language and cognitive skills compared to the rest of Melbourne.

Given the potential adverse effects due to the increase in aircraft noise, mitigation measures should be implemented to minimise the risk to the exposed community. These measures should be based on national and international best practice including:

- Where possible limit the take-offs over the populated area within the Brimbank LGA
- Alternate the direction of take-offs to provide some respite to Brimbank residents from the aircraft noise
- Consideration of a curfew between 11pm and 6am to minimise sleep disturbance that can lead to other adverse health impacts
- If a curfew isn't possible then limit aircraft during these hours to more modern and quieter aircraft

- Implement noise insulation programs in the areas within the ANEF 20 and ANEF 25 contours similar to those previously funded by the Commonwealth Government and implemented in areas impacted by Sydney and Adelaide airports. These programs should be implemented in residential premises, schools, childcare and early learning centres, aged care facilities and public buildings such as libraries and community centres.

7 Review of Air Quality Report

The Air Quality Assessment for the proposed expansion of Melbourne Airport is presented in Chapter B10 of the Melbourne Airport M3R MDP. It appears that the assessment, including air dispersion modelling, was conducted by Melbourne Airport Corporation and reviewed by GHD Pty Ltd. Scenarios for construction as well as operations in 2026 and 2046 have been modelled and include airport operations and associated increases in traffic on the airport land. Off-site impacts have been modelled for these sources at a limited number of sensitive receptors.

The Environment Protection Act 2017 (the Act), and subordinate legislation came into effect on 1 July 2021 and is designed to drive environmental improvements by ensuring that individual industries take responsibility for the risks they pose to human health and the environment. At the centre of the Act is the General Environmental Duty (GED). This requires all duty holders (businesses, industries, community etc) to understand, abate and manage their emissions so that risks of harm to the environment and to human health are minimised. Complying with the GED means taking proactive steps as well as employing industry best practices to minimise risk to human health and the environment, so far as reasonably practicable.

At the time that the new Act came into force the Environmental Reference Standards (ERS) also came into force. The ERS provide reference standards against which the impact of a development or operating business can be assessed. The ERS for air quality adopted the air quality standards in the National Environment Protection (Ambient Air Quality) Measure. Although the ERS are not compliance standards they are used by Government Agencies in decision making processes around new developments and assessment of meeting the requirements of the GED.

Prior to I July 2021 the State Environment Protection Policies – Ambient Air Quality and Air Quality Management – provided the framework for assessing and managing emissions to air in Victoria. These were revoked on 1 July 2021 and according to the EPA Victoria website have no legal standing in Victoria post that date. The ERS have recently been updated (February 2022) to include the new NEPM NO_2 standards and more stringent standards for SO_2 and O_3.

The EPA has also released the Guideline for Assessing and Minimising Air Pollution in Victoria (2022). The draft guideline was released in 2021. The Guideline includes guidance on how to meet the requirements of the GED with respect to air quality assessments, assessing best practice and 'as low as reasonably achievable' emission controls and establishes air quality assessment criteria (AQAC) against which air dispersion modelling results can be compared. The AQAC replace the design criteria in the previous SEPPs.

Although the new EP Act and associated subordinate legislation was in force at the time that the Air Quality Assessment for the Airport Expansion was being prepared it has not been applied as part of the assessment. There is no discussion of the GED and how the emissions/operations are proposed to be managed to minimise the risk of harm to human health or the environment. The SEPP design criteria, which were revoked on 1 July 2021, have been used to assess compliance with air quality requirements in Victoria. This is not valid as the design criteria have had no legal standing in Victoria since 1 July 2021.

The design criteria were developed in 2001. The new AQAC and ERS are more stringent than the previous SEPP criteria. Therefore, the off-site air quality impacts have been assessed as being acceptable against less stringent criteria than those currently applicable in Victoria. If assessed against the ERS or AQAC the outcomes of the assessment may differ. T+T are unable to check this as there is not sufficient detail presented in the Air Quality Assessment conducted by Melbourne Airport Corporation to do a detailed review. It is T+Ts understanding that although the Airport operates on Commonwealth Land, the off-site impacts must be managed to comply with Victorian legislation. This hasn't been done in the reports released by the Airport Corporation. An assessment

of meeting the GED to minimise risk to human health and the environment should have been undertaken and the ERS and AQAC should have been used to assess the outcomes of the air dispersion modelling. A list of potential emission control measures are listed in B10.8.2.3 however they have not been modelled to assess their effectiveness in minimising emissions.

Although the draft Guideline is mentioned in the Air Quality Assessment it is dismissed and has not been followed. Although only available in draft form at the time that the Air Quality Assessment was being undertaken it is the document that EPA Victoria has required to be followed since 1 July 2021. It should have been used to assess the air quality impacts from the proposed airport expansion as it is consistent with the new EP Act requirements.

The main sources of air pollution from airport operations are:

- Ground based operations at the airport including taxiing, take-offs and landings of aircraft, use of ground based vehicles, diesel generators etc
- Overflight emissions
- Increases in road traffic surrounding the airport due to the airport operations.

The Air Quality Assessment has only considered ground based operations within the airport boundary. It does not consider overflight emissions or road traffic surrounding the airport. Overflight emissions usually have minimal impact at ground level therefore excluding them from the modelling is unlikely to significantly change the outcomes of the assessment. However, increases in road traffic in areas surrounding the airport will increase local air pollution and should have been included in the assessment. It is an impact that is directly linked to the proposed airport expansion.

As discussed above, no modelling has been conducted for near road impacts off-site that would be due to increases in traffic on roads external to the airport solely attributable to the airport expansion. Therefore, T+T are unable to provide Council with any assessment of the potential impacts in the Brimbank LGA attributable to increased traffic directly related to the proposed expansion. However, there are significant increases in traffic predicted on Keilor Park Drive and on the Calder Highway west of Keilor Park Drive shown in Table 7-1. Increased traffic and associated congestion are known to increase near road pollution levels. Although not quantified in the air quality assessment, the predicted increases in traffic would result in increased air pollution levels near the affected roads – Keilor Park Drive and Calder Highway. There are no traffic predictions in the air quality report for other roads within the Brimbank LGA.

Table 7-1: Predicted Annual Increases in Traffic Keilor Park Drive and Calder Freeway west Keilor Park Drive No Build vs Build (Source: Tables 10:13 and 10:14 Melbourne Airport Corporation Air Quality Assessment)

Road Traffic Predictions	No Build	Build	Increase in Traffic due to Airport
Keilor Park Drive 2026	6,741,317	7,183,860	442,543
Keilor Park Drive 2046	8,972,253	10,274,506	1,302,253
Calder Fwy 2026	24,992,195	25,427,788	435,593
Calder Fwy 2046	31,602,969	33,199,029	1,596,060

To assess the potential impact on air quality the Airport Corporation has established Significance Criteria. According to Table 10.4 of the Air Quality Assessment an increase in an air pollutant level between 1% and 20% of the project standard is considered a minor impact. An increase of between 20% and 99% of the project standard is considered to be moderate impact. It is unclear how these

numbers were determined. They are not consistent with the current Victorian Guidance for Air Quality Assessments. According to the EPA Guideline for Assessing and Minimising Air Pollution in Victoria, an increase in air pollution levels less than 4% of the air quality assessment criteria is considered insignificant. Above 4% it is considered a significant impact and requires further assessment. This means that the impact of an incremental increase in pollutant level is being assessed by the Airport that is assessed as minor would be considered as significant by the EPA. Therefore, the impact would be considered greater if assessed by the current Victorian legislation than that used by the Airport Corporation for the same incremental increase.

The approach used by the Airport Corporation to determine the significance of the impact on increases in pollution levels highlights the importance of the selection of air quality assessment criteria used. For example, if a less stringent standard has been used, then 20% of that standard is higher than if a more stringent (lower) standard has been used. This is important as the Airport Corporation has used the old design criteria that were in the SEPPs which are less stringent than the current AQACs and ERS. This combined with the higher percentages of the AQAC used in determining Significance of the impact means that the conclusions drawn that an impact is minor or moderate are unreliable. If assessed using the current Victorian legislation and guidance it is likely that the Significance rating of the impact would be higher.

The Air Quality Assessment concludes that comparisons of model results for the No Build and Build scenarios indicated that Build leads to slightly worse air quality impacts overall – which is to be expected given the substantial increases in air and road traffic due to the Build. In all scenarios however, compliance with SEPP(AQM) criteria was achieved, except where background levels were already high (in the case of PM_{10}). The assessed risk levels for the operational case Build 2046 for all pollutants all ranged between negligible and medium. These conclusions would change if the current requirements for air quality assessments in Victoria were used rather than the SEPP (AQM) criteria which are less stringent and have been revoked.

The initial risk level for the M3R construction was assessed as high, but consideration of additional mitigation measures decreased this risk level to medium (Section B10.6). The Air Quality Assessment concludes that the potential for air quality impacts due to dust emissions from construction activities is anticipated to be mitigated to satisfactory levels through the application of dust suppression techniques implemented through the CEMP. The predicted concentration of nuisance dust as shown in Figure B10:13 extend beyond the airport boundary into the Brimbank LGA. The contour extends close to the residential receptor on Overnewton Road. Monitoring should be implemented at this location during the construction to ensure that the impacts are being managed so that any impacts are confined within the airport boundary and not impacting on sensitive receptors within Brimbank.

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- Kealba: https://quickstats.censusdata.abs.gov.au/census_services/getproduct/census/2016/quickstat/SSC21304
- Keilor: https://quickstats.censusdata.abs.gov.au/census_services/getproduct/census/2016/quickstat/SSC21306
- Keilor Park: https://quickstats.censusdata.abs.gov.au/census_services/getproduct/census/2016/quickstat/SSC21311
- Sunshine (Vic.): https://quickstats.censusdata.abs.gov.au/census_services/getproduct/census/2016/quickstat/SSC22383?opendocument
- Sunshine North: https://quickstats.censusdata.abs.gov.au/census_services/getproduct/census/2016/quickstat/SSC22384
- Victoria (state): https://quickstats.censusdata.abs.gov.au/census_services/getproduct/census/2016/quickstat/2?opendocument

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9 Applicability

This report has been prepared for the exclusive use of our client Brimbank City Council, with respect to the particular brief given to us and it may not be relied upon in other contexts or for any other purpose, or by any person other than our client, without our prior written agreement.

Tonkin & Taylor Pty Ltd

Report prepared by:	Authorised for Tonkin & Taylor Pty Ltd by:
.....	.....
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Appendix A: Marshall Day Report

MARSHALL DAY Acoustics

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21 February 2022

Tonkin + Taylor
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Attention: Ms Suk-yi Lo

Dear Suk-yi

MELBOURNE AIRPORT EXPANSION - NOISE EXPOSURE REVIEW

Tonkin + Taylor, on behalf of the Brimbank City Council, is undertaking a health impact study for areas in the vicinity of Melbourne Airport. Specifically, the study is to assist Council with input to their submission on the Melbourne Airport Master Plan 2022.

Aircraft noise information is typically provided in range of formats, including exposure noise metrics (e.g. Australian Noise Exposure Forecast, ANEF) and single event metrics (e.g. maximum noise levels, L_{ASmax}).

The ANEF is the most common published aircraft noise exposure metric in Australia. There is however limited data that correlates ANEF levels and health impacts; rather studies have been focussed on impacts such as annoyance arising from aircraft noise. Further details on community response to aircraft noise is provided in Appendix A.

The aircraft noise metrics adopted by Tonkin + Taylor to inform their health study/review are based on the World Health Organization (WHO) guidance, which reference the following noise metrics:

- L_{den}, the day-evening-night equivalent sound level over a 24 hour period with a:
  - 5 dB penalty applied to aircraft operations that occur during the evening period (6 pm – 10 pm)
  - 10 dB penalty applied to aircraft operations that occur during the night-time period (10 pm – 7 am)
- L_{night}, the equivalent sound level over the period of aircraft operations between 10 pm and 7 am

In the absence of publicly available information associated with Melbourne Airport operations in the form of the above metrics, Marshall Day Acoustics (MDA) has estimated a relationship between the ANEF and these metrics. The estimated conversion factors between the metrics are detailed in Table 1. Details on the method to establish these factors is described in Appendix B.

Table 1: Estimated relationships between ANEF and other aircraft noise metrics

Metric	Conversion factor from ANEF	Example for given ANEF value 20
ANEF	n/a	20 ANEF
L_{den}	+ 41	61 dB L_{den}
L_{night}	+ 33	53 dB L_{night}
$L_{Aeq,24hr}$	+ 37	57 dB $L_{Aeq,24hr}$

It is intended that this information can be used in combination with the published aircraft noise information for Melbourne Airport, and interpreted by Tonkin + Taylor to draw conclusions on potential health impacts.

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An example of such analysis is the application of the conversion factors in Table 1 to noise contours contained within the Melbourne Airport Master Plan 2022. Specifically, review of the 2019 ANEI and the 2052 ANEF contours, provides an indication on the likely change in aircraft noise exposure from current airport operations and forecast long range future operations. Refer to Appendix C for an example of annotated figures.

We trust this information is satisfactory for your needs at this time. If you have any queries or comments, please do not hesitate to contact us to discuss.

Yours faithfully

MARSHALL DAY ACOUSTICS PTY LTD

Alex Morabito

Senior Associate

APPENDIX A COMMUNITY RESPONSE TO AIRCRAFT NOISE

A large number of overseas studies have been carried out to investigate community response to environmental noise. The general approach of these studies is to question residents (verbally or in writing) as to their level of annoyance due to a particular noise source. The noise level at the respondent's location is then determined by either measurements or by referencing noise modelling outputs, such as noise contours.

In many countries, aircraft noise levels are measured/calculated as L_{dn} – the Day/Night Level, which involves a summation of the noise energy over 24 hours with a 10 dB penalty for noise occurring at night. Land use planning around major Australian airports uses the Australian Noise Exposure Forecast (ANEF) metric for aircraft noise, which is based on a similar noise energy exposure concept to the L_{dn} metric. There is a generally accepted conversion factor between the two parameters of $L_{dn} \approx$ ANEF + 35.

A graph of the percentage of people highly annoyed plotted versus the level of noise exposure, allows a 'dose-response curve' to be produced. In 1978, Schultz[1] provided the first synthesis of various studies into community response to transportation noise (including aircraft noise).

In 2001, Miedema and Oudshoorn[2] examined the aircraft specific studies into community response to noise. Their analysis was based on 20 studies from around the world which included over 40 airports (some studies looked at multiple airports) with 34,214 respondents. Over the past 20 years, the Miedema and Oudshoorn dose-response curve has been regarded as the 'current state of knowledge' into community response to aircraft noise.

In the last 5 years, a number of new comprehensive airport studies have been carried out. The two most significant of these are the FAA Neighbourhood Noise Study 2021[3] and the Guski (WHO) Aircraft Noise Annoyance 2018[4] studies. The dose-response curves from these studies are shown in Figure 1, together with the earlier Miedema 2001 and Schultz 1978 studies.

The findings from the recent FAA and Guski studies indicate that community annoyance to aircraft noise appears to have increased by approximately 10 dB; this is a significant increase in sensitivity.

Australian Standard AS 2021-2015 *Acoustics-Aircraft noise intrusion-Building siting and construction* (AS 2021) was updated prior to the FAA and Guski studies, however the Standard still referred to community response findings from a study in 1979.[5] The findings of that study were broadly similar to the Miedema 2001 study.

Figure 1 shows that at 55 dB L_{dn} (approximately ANEF 20), 30 % of people are expected to be highly annoyed by aircraft noise. It also shows that noise effects occur in locations below 55 dB L_{dn} (ANEF 20), e.g., 20 % highly annoyed at 50 dB L_{dn}.

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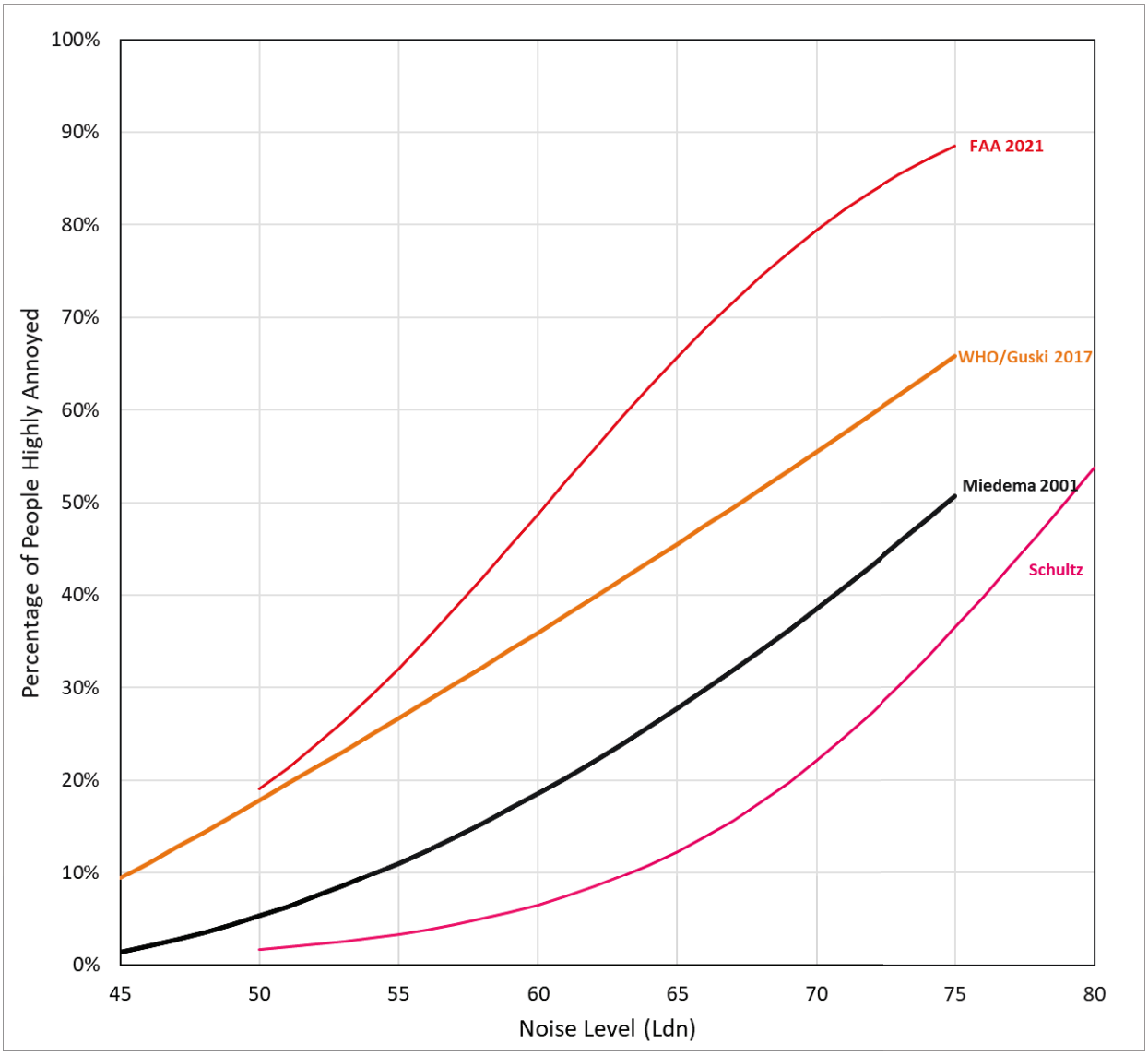
Figure 1: Summary of Dose-response curves



APPENDIX B CONVERSION FACTOR PROCESS

MDA has prepared aircraft noise contours for several airports throughout Australia and New Zealand, ranging in size and operations that occur.

To establish conversion factors between the various aircraft noise metrics, noise model data for airports which are currently similar in size and operation (number of annual movements) to Melbourne Airport has been used. Specifically, the forecast annual noise models prepared for Auckland Airport and Christchurch Airport were recalculated for each noise metric of interest. The noise levels were calculated for a 10 nautical mile (nmi) grid around each airport, at discrete points spaced at 0.2 nmi (370 m) apart.

For each discrete point, the difference between the calculated ANEF value and other respective metrics was determined. An analysis of the differences was undertaken, and an average value used as the estimated conversion factors presented in Table 1.

This process demonstrated good agreement and limited spread in the differences across the grid (±1-3 dB across the 10 nmi study area for the various metrics).

However, it is noted that, ideally, the equivalent process should be undertaken by those responsible for the preparation of the Melbourne Airport noise contours to recalculate and determine the airport-specific aircraft noise levels in the requisite noise metrics.

It is noted that the contours in Appendix C do not clearly indicate the extent of areas exposed to aircraft levels below 61 dB L_{den}, 53 dB L_{night} or 57 dB $L_{Aeq,24hr}$. Accordingly, in instances where impacts (health or other) occur at lower thresholds, then further information from Melbourne Airport is required.

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APPENDIX C MELBOURNE AIRPORT NOISE CONTOURS

Source: Melbourne Airport (2022), *Preliminary Draft Master Plan 2022,* Australia Pacific Airports (Melbourne) Pty Ltd

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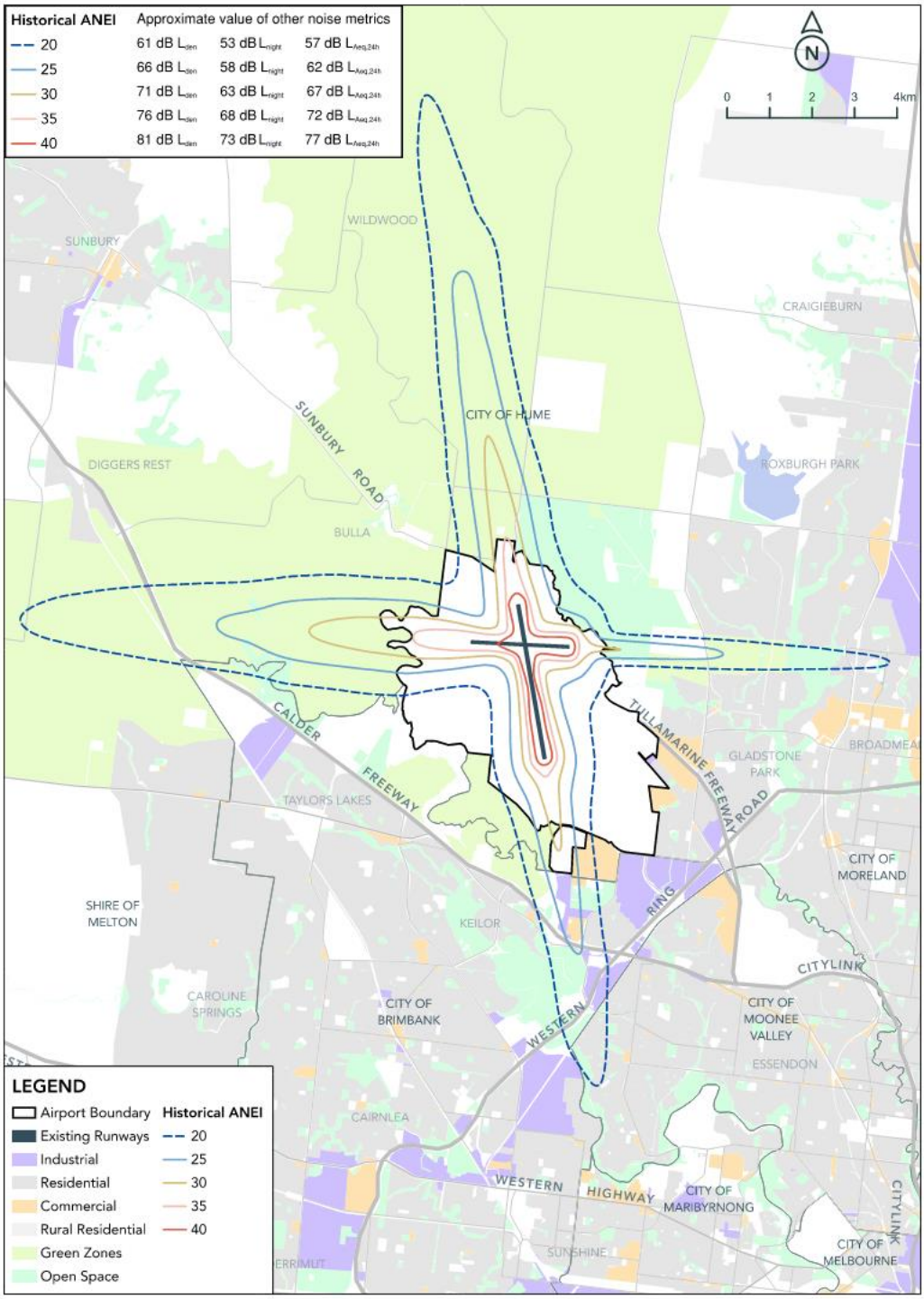
C1 2019 ANEI

Preliminary Draft Master Plan 2022

Figure 15-26
2019 ANEI for Melbourne Airport



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Attachment 12.2.1

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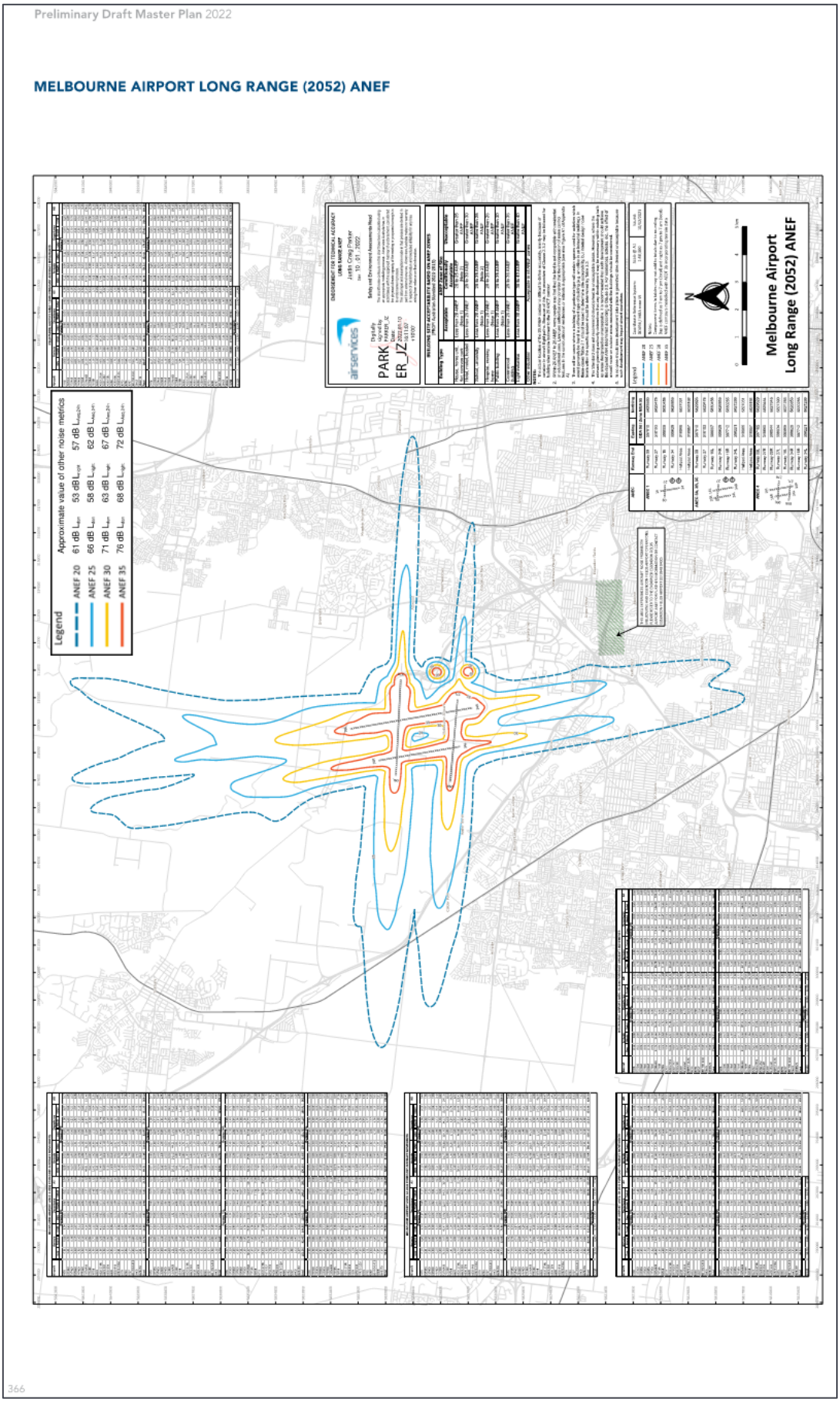
C2 2052 LONG RANGE ANEF



Attachment 12.2.1

Sustainability Policy

Overview

Our Purpose: Our people, through their leading expertise, create a legacy of outstanding value for our clients, our environment, and our communities.

This Sustainability Policy sets out our aspirations, commitments, and actions to respond to the global and local sustainability challenges facing our natural environment and society. It will support us in credibly delivering on **Our Pathway** (**Purpose and Values**) and demonstrating our contribution to the Sustainable Development Goals in our own operations and through the work we do with our clients. We will be updating the Policy as we develop and implement our strategic response in each of our three impact areas.

Our greatest impacts are in the following three areas:

1. Provision of targeted sustainability services for our clients
2. Our ability to deliver sustainable outcomes across all our projects
3. Our people communities, and the footprint of our operations

In this policy we consider how our collective actions can reduce negative impacts and maximise positive impacts in each of these areas.

Sustainability at Tonkin + Taylor

Sustainability as a service

Our expertise includes sustainability strategy and reporting, along with understanding and managing specific challenges within sustainability, including climate change adaption and resilience, environmental management systems, natural hazards and disaster risk reduction, biodiversity, and water quality. We are committed to ensuring that our people remain at the forefront of approaches to respond to these challenges, and provide strategic, long-term thinking for our clients and our communities.

Delivering sustainable outcomes on all our projects

Through our portfolio of projects, we can influence all aspects of sustainability.

T+T aspires to work with clients that have aligned values and sustainability objectives. We choose projects and clients where our advice will be taken on board, such that our involvement will leave the environment and communities better off.

In addition to providing our clients with the best technical advice and solutions, we care committed to building the ability of all our people to consider the wider context and potential impacts of each and every project. This includes considering the details of the project across its lifecycle, as well as the systematic view of how our contribution might positively influence other sustainability outcomes connected to the project.

Internal sustainability

T+T is committed to 'walking the talk' and integrating sustainability into how we operate.

We are implementing a wide range of sustainability initiatives to minimise our environmental footprint, support our people and communities, and enhance our natural environment.

Areas of our operations that we are targeting include:

- Reducing our carbon footprint
- Reducing consumption and practicing sustainable procurement
- Looking after the health, safety, and wellbeing of our people
- Creating an inclusive and diverse team
- Contributing to the next generation of technical specialists
- Playing an active role in developing our profession
- Contributing to our local communities

www.tonkintaylor.com.au

SUBMISSION

ON BEHALF OF BRIMBANK CITY COUNCIL

Preliminary draft Melbourne Airport 2022 Master Plan and Major Development Plan

Submission considering compensation

26 April 2022

INTRODUCTION

1. This submission is made in response to the preliminary draft 2022 Master Plan (**draft Master Plan**) and preliminary draft Major Development Plan (**draft MDP**) currently on exhibition.

2. These documents relate to Melbourne Airport's proposed third runway to run parallel to the existing north-south runway (**third runway**).

3. Specifically, this submission advocates for compensation to be provided either by means of a noise amelioration program (**NAP**) or other forms of compensation to owners of dwellings and buildings accommodating sensitive land uses (i.e. schools, places of worship, childcare centres and hospitals) adversely affected by aircraft noise associated with Melbourne Airport.

SUBMISSIONS

4. Policy rationale

4.1 Council submits there is both a sound policy rationale and need for compensation to those adversely affected by both existing aircraft noise and future anticipated aircraft noise from the operations of Melbourne Airport.

4.2 The purpose of such compensation is to reduce the impact of adverse aircraft noise on the affected communities around Melbourne Airport by either insulating dwellings and buildings accommodating sensitive land uses or by other forms of compensation, as necessary.

4.3 Current policy on aircraft noise appears to be based on a mix of historical, political and engineering considerations. It does not appear to be based in any evidence on adverse impacts or any set of coherent underlying principles.

4.4 This has given rise to inherent inequities and inconsistencies.

4.5 First, aircraft noise exposure is a health risk. Noise is one of the most detrimental side effects of aviation. This does not appear to be a relevant consideration in either the draft Master Plan or draft MDP on exhibition. This is a fundamental flaw.

4.6 The Noise Health Risk Assessment prepared by Tonkin + Taylor on Council's behalf (**NHRA**) identifies the main health effects associated with environmental noise as annoyance, sleep disturbance, increase in ischaemic heart disease, cognitive impairment and psychological effects including anxiety and depression.[1]

4.7 Second, the health problems identified above can also cause negative economic effects as they impact the productivity of workers and cause a burden on health care systems.

4.8 In broad terms, reducing the harm (identified above) is beneficial for health and the broader community.

4.9 These impacts of adverse aircraft noise on particular communities either under flight paths or in close proximity to the airport raise issues of fairness. Council submits the distribution of aircraft noise exposure results in a 'fairness dilemma'. A dilemma exists between the airport's beneficial economic impact for the region and the physical and psychological integrity of affected persons, including children.

[1] Page 8.

4.10 Council submits the case for compensation is compelling. The form of compensation should be assessed through a lens of the following principles. Council will expand on these principles in its submissions below. For now, these principles are:

4.10.1 **fairness and equity**, where a balance must be struck and some form of compensation provided in the context of a current unfair distribution of adverse aircraft noise on particularly segments of the community;

4.10.2 **responsibility**, where the airport accepts accountability (if not at least partially) for the adverse aircraft noise outcomes;

4.10.3 **proportionality and reasonableness**, where the compensation scheme (and extent of compensation) is structured in a balanced, reasonable and commensurate manner;

4.10.4 **consistency** in rules and standards which must be fairly and consistently implemented;

4.10.5 **transparency**, where the targeted and focused fixing of the adverse aircraft noise is minimised in a simple, effective and user friendly way;

4.10.6 **accountability**, such that decisions can be justified under public scrutiny; and

4.10.7 **agility**, so that we look forward and are able to anticipate and adapt to reasonably anticipated change.

4.11 The third runway and Melbourne Airport's expansion comes with it an increase in flight movements (and a reshuffling of departure/approach routes) and thus a redistribution of the noise and its impacts.

4.12 As a result, in broad terms some dwellings and buildings accommodating sensitive uses will experience an increase in noise exposure (while others may decrease). It is inherently unfair that communities living and working in buildings accommodating sensitive uses close to airports or under flight paths may experience excessive and prolonged exposure to adverse aircraft noise.

4.13 The key issues identified from the stakeholder engagement undertaken as part of the NHRA include:[2]

4.13.1 impacts on sleep, with some residents in Keilor, Keilor Park, Keilor Village and Kealba stating they get a maximum of 3 to 4 hours sleep a night and such sleep quality is highly disturbed;

4.13.2 inability to hold conversations when planes are taking off and in some physical pain (resulting from an increased pressure in their ears);

4.13.3 inability to open the windows in dwellings due to the increase in noise when they are open;

4.13.4 inability to use private open space associated with dwellings and enjoy the privacy of one's home.

4.14 Further, residents and other 'receivers' of adverse aircraft noise living under air corridors have to bear not only the aircraft noise (and its ramifications) but the costs including the loss of property value and any mitigation measures (to the extent they can afford them and have undertaken remedial insulation measures).

[2] Page 4.

4.15 Here, a further fundamental unfairness and inconsistency is the fact that adversely affected communities around both Adelaide Airport and Sydney Airport have benefited from compensation schemes.

4.16 The absence of any set of coherent underlying principles when assessing adverse aircraft noise impacts and the consequential issue of fairness and impact is demonstrated, for example, in the Commonwealth Government's *White Paper on National Aviation Policy in 2009*. The paper enunciates a principle underlying curfews, but only obliquely referred to 'providing communities around airports with respite'. The paper does not explain why the significant number of residents living around Melbourne Airport do not warrant any 'respite' from night-time flights, while those in Adelaide and Sydney do.

4.17 Finally, communities experiencing adverse aircraft noise have little to no control over the decision of how the burden of noise is distributed. This too goes to the heart of issues of fairness.

4.18 The uneven spread of adverse and prolonged aircraft noise in proximity to an airport result in this 'fairness dilemma'. The adverse aircraft noise is required to be shouldered by one group of people (sensitive noise receivers experiencing the impact) while the advantages of the airport are shared collectively by a broader collective of people at large.

4.19 Where individuals' lives are adversely impacted by aviation noise (including their health, wellbeing and quality of life) but the responsibility and benefits lie with bodies elsewhere, there is an inherent imbalance which must be addressed.

4.20 This leads to another key principle, that of 'responsibility'. The relationship between aviation noise and people's health and well being should be better understood and better integrated into decision-making. Where necessary, people should have access to consistent mitigation and compensation treating all people fairly no matter where they reside.

4.21 Aircraft noise is caused by human conduct (as opposed to natural sounds) and should be viewed as part of social exchange. The measures to safeguard and maintain, protect and support Melbourne Airport's ongoing operations must be balanced with the needs of communities surrounding the airport.

4.22 The airport is responsible (if not at least partially) for the noise sensitive land users have to bear. Importantly, Melbourne Airport already recognises and accepts protecting and safeguarding airport operations is an 'ongoing and shared responsibility' between the airport and all levels of government. The current 2018 Master Plan states:

> The capacity of an airport to operate unencumbered is fundamentally dependent on what occurs on the land surrounding it. Safeguarding the operations of Melbourne Airport is an ongoing and shared responsibility between all levels of government and the airport.

4.23 Council submits a balance must be struck and some form of compensation provided in the context of this unfair distribution of adverse aircraft noise. There is an obligation on Melbourne Airport to consider off-airport impacts and where those impacts, either existing or anticipated, are unreasonable, to ameliorate those impacts or, if the impacts cannot be satisfactorily ameliorated, then compensated.

4.24 Here, the principles of ‘proportionality’ and ‘reasonableness’ should be engaged. The form of compensation and identifying the benefiting communities should be informed by at least the following two key elements:

4.24.1 The first is a measurement of the extent of exposure to noise, for example the size of the population affected by the noise at a certain level.

4.24.2 The second is a judgment as to the extent which that exposure is having an adverse effect.

4.25 Council submits the responsibility to compensate or mitigate noise to affected communities living close to airports or under flight paths experiencing excessive and prolonged exposure to adverse aircraft noise lies with Melbourne Airport. The principle of proportionality suggests providing compensation in the following manner:

4.25.1 mitigation works, such as sound insulation schemes where it can sufficiently reduce noise in households and other sensitive land uses; and

4.25.2 compensation to assist in relocation away from areas of excessive noise where mitigation is not effective in sufficiently reducing aircraft noise.

5. Legislative framework

5.1 A legislative framework already exists to facilitate a Commonwealth funded NAP for airports in Australia.

5.2 We summarise this legislative framework in **Appendix A** to our submission.

5.3 We observe the existing scheme has operated to-date in Australia for:

5.3.1 Sydney's Kingsford-Smith Airport (**KSA**) between 1995 and 2013 and

5.3.2 Adelaide Airport between 2000 and 2013.

5.4 In respect of KSA, the Sydney Airport Noise Amelioration Program (**SANAP**) applied to dwellings and public buildings defined by their location within certain ANEF contours surrounding the airport at large. It was not confined solely to impacts flowing from the new third runway at the KSA.

5.5 This was also the case in the Adelaide Airport Noise Amelioration program (**AANAP**) which concerned the effects of the airport at large.

6. Australian and international NAPs

6.1 We have considered the previous NAPs in Australia together with previous and current international examples. We summarise these programs at **Appendix B**. This summary is not intended to be exhaustive, but rather to usefully assist in determining certain classes of affected buildings accommodating sensitive land uses together with guiding principles for a possible framework.

6.2 From the outset, Council submits the future growth of Melbourne Airport and the approval of the third runway must be conditional on implementing a NAP under the existing legislative framework.

6.3 The form of compensation must be effective and informed by an evidence-based approach.

6.4 It is instructive to have regard to the two previous Commonwealth compensation schemes.

Determining eligibility with reference to ANEF contours

6.5 Both NAPs for KSA and Adelaide Airport were premised on the principles of 'proportionality' and 'reasonableness' described in paragraph 4.24.

6.6 In broad terms, this resulted in schemes where:

6.6.1 the most seriously affected dwellings and buildings used for sensitive uses within the 40 ANEF contour were voluntarily acquired; and

6.6.2 financial assistance was provided for noise insulation measures of these buildings within certain ANEF contours (observing these contours were similarly defined in both schemes).

6.7 As a starting point only, it is both reasonable and proportionate that these affected buildings are identified in eligibility terms by reference to their location within the proposed 2022 ANEF contours as informed by evidence.

6.8 However, Council submits it is starting point and not an end point.

6.9 Where the research underpinning the previous Australian schemes is some 27 years old, Council considers it not only beneficial but necessary to have regard to current World Health Organisation (**WHO**) literature considering impacts of aircraft noise in informing these eligibility parameters.

Establishing indoor noise reduction targets

6.10 It is critical any NAP establishes a quantifiable noise reduction target to be met – resulting in specific standards of noise reduction for different affected buildings and rooms within buildings (i.e. habitable versus non-habitable).

6.11 This approach also assists in setting realistic expectations with affected property owners.

6.12 Both previous NAPs established performance based indoor noise reduction targets (i.e. for habitable rooms).

6.13 These were a designated noise reduction target of:

6.13.1 50dB(A) in bedrooms; and

6.13.2 60dB(A) in other living areas of a dwelling excluding bathrooms and laundries.

6.14 These designated noise reduction targets were consistent with relevant Victorian Civil and Administrative Tribunal (**Tribunal**) decisions considering adverse noise impacts on dwellings.[3]

6.15 However, since those Tribunal decisions, clause 58.04.3 has been introduced into the Victorian Planning Provisions applying internal noise targets to apartment buildings of 5 or more storeys. This clause provides yet another standard. Relevantly, the Tribunal decisions did not consider ameliorating adverse and prolonged aircraft noise in proximity to Melbourne Airport, nor was clause 58.04-3 enacted for this purpose.

6.16 A further standard is that recommended by WHO. We observe WHO's noise reduction targets are 40dB(A) in bedrooms and 45dB(A) in other habitable living areas of a dwelling.

[3] See for example: *Richmond Icon Pty Ltd v Yarra CC* (Red Dot) [2011] VCAT 2175 and *Strathelie Property Holdings Pty Ltd v Yarra CC* [2014] VCAT 513.

6.17 Council submits great weight should be placed on the WHO targets. This is because the WHO literature comprises the most recent and authoritative opinion considering aircraft noise in particular and its impacts on health, well being and quality of life. This is well documented in the NHRA prepared by Tonkin + Taylor on Council's behalf.

6.18 Council does not advocate for a particular noise target, although it submits the WHO target should be the starting position. Rather Council advocates for an outcome ensuring aircraft noise does not adversely impact sensitive receiver's health, well being and quality of life. These considerations are paramount.

6.19 In achieving these paramount outcomes, Council submits further work informed by expert evidence must be undertaken to determine the criteria used in setting such targets with a view to ensuing aircraft noise does not adversely impact sensitive receiver's health, well being and quality of life. To-date no such analysis has been commissioned by either the Department or Melbourne Airport.

6.20 This must be done. The outcomes of such evidence-based review should inform the extent of noise attenuation measures required.

Reporting and monitoring systems

6.21 Once the noise target is established, best practice for noise insulation schemes should be implemented. This is to ensure consistency, clarity and fairness in the way insulation is used to mitigate aviation noise impacts in the future.

6.22 It will be necessary any NAP incorporates reporting and monitoring systems designed to measure the program's implementation in a comprehensive, transparent and timely manner.

6.23 To this end, we observe:

6.23.1 in the ANAAP, the Commonwealth Government reported on progress to the Adelaide Airport Consultative Committee on a regular basis during the program. This mechanism provided feedback to the airport and all stakeholders on the scheme's ongoing implementation; and

6.23.2 in the SANAP, a performance audit was undertaken in 1997 (some 2 years after the program was established) and tabled in Parliament.[4] The audit identified a number of key issues and recommendations.

6.24 It is important these historical reports and audits are reviewed in establishing an equivalent scheme in Melbourne, together with critically evaluating the performance and consistency of both approaches more broadly.

6.25 This will assist in achieving best practice, ensuring the measures employed are effective and avoiding any failures or issues that previously arose.

7. Determining eligibility and types of compensation

7.1 Eligibility for the proposed scheme should be informed by the learnings of the previous Commonwealth schemes and underpinned by an evidence-based approach set out above.

[4] Sydney Airport Noise Amelioration Program (anao.gov.au)

7.2 Council submits as a matter of fairness and consistency, the following eligibility parameters implemented by both previous Commonwealth schemes constitute a reasonable starting position (reiterating Council submits the noise target will likely be insufficient and lacking in order to ensure aircraft noise does not adversely impact sensitive receiver's health, well being and quality of life). These are:

7.2.1 **Class 1: Dwellings and buildings accommodating sensitive land uses within the 2022 40 ANEF contour**

Voluntarily acquiring dwellings and buildings accommodating sensitive land uses (i.e. schools, places of worship, childcare centres and hospitals) within the most severe zone or 2022 40 ANEF contour.

Where affected landowners do not consent to acquisition, financial assistance to insulate dwellings to achieve compliance with s 3 of Australian Standard AS 2021-2015, Acoustics - *Aircraft Noise Intrusion - Building Siting and Construction*, issued by Standards Australia Limited (**Australian Standard**), acknowledging full compliance may not be possible.

Within the Brimbank municipality, the 40 ANEF contour is contained entirely within the Melbourne Airport boundary (i.e. there are no dwellings or buildings accommodating sensitive land uses). Council has not considered other affected municipalities.

7.2.2 **Class 2: Dwellings within the 2022 30 to 35 ANEF contours**

Financial assistance to insulate dwellings within the 2022 30 to 35 ANEF contour (to achieve designated noise reduction targets observing these targets will be (40dB(A) to 50dB(A) in bedrooms and 45dB(A) to 60dB(A) in other living areas of a dwelling excluding bathrooms and laundries or as otherwise determined by evidence).

7.2.3 **Class 3: Buildings accommodating sensitive land uses within the 2022 25 ANEF contour**

Financial assistance to insulate buildings accommodating sensitive land uses the 2022 25 ANEF contour to achieve compliance with s 3 of the Australian Standard.

7.3 In addition, Council submits two additional classes arise in the context of Melbourne Airport specifically:

7.3.1 **Class 4:** Dwellings and buildings accommodating sensitive land uses built in accordance with the requirements of the Brimbank Planning Scheme (**Scheme**) at that time but now proposed for inclusion in the Melbourne Airport Environs Overlay (**MAEO**) as a result of the 2022 ANEF contours and do not comply with the Australian Standard.

7.3.2 **Class 5:** Dwellings and buildings accommodating sensitive land uses constructed in accordance with the requirements of the MAEO (i.e. to meet the Australian Standard) proposed to be removed from the MAEO as a result of the third runway.

7.4 Having regard to both national and international schemes summarised at **Appendix B**, noise insultation works within the scope of the compensation scheme should include (among other things):

7.4.1 providing ducted air-conditioning;

7.4.2 external door replacement and/or seals;

7.4.3 blocking vents and openings from external walls;

7.4.4 window replacement and/or secondary glazing; and

7.4.5 soft fibre insultation in roof/ceiling/external walls and loaded vinyl.

7.5 Ventilation is an important component of any sound insulation scheme as it is essential to ensure windows can remain closed, particularly in a Victorian hot summer.

7.6 Fairly, the quantum of compensation payable for each affected building (whether it be a monetary contribution or the commissioning of the necessary works) should be capped. This is consistent with existing legislative framework and any monetary cap should be informed by an evidence-based approach.

8. Eligibility classes

Classes 1 to 3

8.1 Again, we reiterate classes 1 – 3 are intended only as a starting position and accord with the eligibility classes adopted in the previous Commonwealth schemes.

8.2 Importantly, a building is rendered eligible (or qualifying for compensation) based solely on its location within the ANEF contours (and not for example, its construction date).

8.3 Having regard to the principles of fairness, and equity, Council submits there is arguably a case to expand the eligibility criteria (i.e. beyond the ANEF contour parameters contemplated above) for the following two circumstances:

8.3.1 **Sub-class 1:** existing dwellings and buildings accommodating sensitive land uses constructed before the Melbourne Airport construction project was announced in 1959.

8.3.2 **Sub-class 2**: dwellings and buildings accommodating sensitive land uses constructed after 1959 but before the former Airport Environs Overlay was introduced on an interim basis through planning scheme amendment L45 to the former Keilor Planning Scheme on 27 May 1992.

8.3.3 **Sub-class 3:** existing dwellings and buildings accommodating sensitive land uses identified within the 2022 ANEF contours (and not the 2018 ANEF contours).

Sub-class 1

8.4 Sub-class 1 comprises existing dwellings and buildings accommodating sensitive land uses constructed before the Melbourne Airport construction project was announced in 1959.

8.5 In fairness and equity terms, compensation is arguably most justified for this sub-class for reasons including:

8.5.1 these buildings were purchased and occupied with no prior knowledge of the Melbourne Airport's subsequent construction in its current location and its impacts;

8.5.2 this population had and continues to have no control about how the burden of noise is distributed; and

8.5.3 the burden and financial costs of implementing necessary noise attenuation to-date lies exclusively with affected landowners.

8.6 The need to compensate this class is consistent with the well-established 'agent of change principle', encapsulating the position an agent introducing a new land use is responsible for managing the impacts flowing from that land use (including adverse aircraft noise).

8.7 To-date however, in the absence of any compensation scheme for the aircraft noise implications of the airport's location, neither Melbourne Airport nor the Commonwealth Government can be said to have fairly or reasonably assumed any responsibility for these consequences.

8.8 It will be necessary to assign certain eligibility parameters to this sub-class. Council submits this should include all dwellings and buildings constructed before the Melbourne Airport construction project was announced in 1959 located within the 2022 25 ANEF.

8.9 There are approximately 1344 properties within the 2022 25 ANEF contour in the Brimbank municipality. These properties are shown in the map forming **Appendix C**. Of those, approximately 379 of those properties constitute dwellings and buildings accommodating sensitive land uses constructed before the Melbourne Airport construction project was announced in 1959.

Sub-class 2

8.10 Sub-class 2 comprises dwellings and buildings accommodating sensitive land uses constructed after 1959 but before the former Airport Environs Overlay was introduced.

8.11 In fairness and equity terms, Council submits a departure from the standard eligibility criteria for this sub-class is also justified for this sub-class for reasons including:

8.11.1 While affected landowners may have had prior knowledge of the Melbourne Airport project, the adverse noise impacts flowing from Melbourne Airport were not documented in the former Keilor Planning Scheme, nor any requirement to incorporate noise attenuation measures into buildings in these areas;

8.11.2 like sub-class 1, this population had and continues to have no control about how the burden of noise is distributed; and

8.11.3 the burden and financial costs of implementing necessary noise attenuation to-date lies exclusively with affected landowners.

8.12 Applying the agent of change principle, it was and remains incumbent on Melbourne Airport to manage the impacts (including noise) of the airport. Until such time as the former Airport

Environs Overlay was introduced into the former Keilor Planning Scheme, the burden of attenuating noise through construction techniques cannot be reasonably said to have fallen entirely on the affected landowner.

8.13 It will again be necessary to assign certain eligibility parameters to this sub-class. Council submits this should also comprise all dwellings and buildings accommodating sensitive land uses constructed after 1959 but before 27 May 1992 (when the AEO was introduced on an interim basis) within the 2022 25 ANEF contour.

8.14 As stated above, there are approximately 1344 properties within the 2022 25 ANEF within the Brimbank municipality. These properties are shown in the map forming **Appendix C**. Of those, the majority of those properties constitute dwellings and buildings accommodating sensitive land uses constructed after 1959 but before 27 May 1992 within the 2022 25 ANEF.

Sub-class 3

8.15 Sub-class 3 comprises dwellings and buildings accommodating sensitive land uses newly identified within the 2022 ANEF contours (and not the 2018 ANEF contours).

8.16 This primarily comprises buildings accommodating sensitive land uses south of the airport within the Brimbank municipality, affected as a direct consequence of the proposed third runway.

8.17 Here, again the airport is directly responsible for the adverse aircraft noise residents and other affected sensitive land users will have to bear (and have not necessarily had to to-date).

8.18 Consistent with the agent of change principle, there is a clear obligation on Melbourne Airport to ameliorate the adverse noise impacts resulting from the proposed third runway.

8.19 It will be necessary to assign eligibility parameters for buildings within the ANEF contours based on severity of impact. In the interests of consistency and fairness, this should be aligned with Class 1.

8.20 It will also be necessary to assign eligibility parameters for this sub-class. Council submits this should include dwellings and buildings accommodating sensitive land uses newly identified within the 2022 20 ANEF contour.

8.21 There are approximately 725 properties within the 2022 20 ANEF contour (not included in the 2018 ANEF contours). These properties are shown in the map forming **Appendix D**. The majority of those properties constitute dwellings and buildings accommodating sensitive land uses.

Class 4

8.22 Class 4 comprises dwellings and buildings accommodating sensitive land uses:

8.22.1 not included in the MAEO at the time they were constructed;

8.22.2 in turn, not required to have been constructed in compliance with any noise attenuation measures required by the Australian Standard as required under clause 45.08-2 of the MAEO;

8.22.3 subsequently included in the MAEO as a result of Planning Scheme Amendment VC173 gazetted on 28 October 2021; and

8.22.4 not complying with the noise attenuation measures required in the Australian Standard.

8.23 This circumstance arises (at least partially) as a result of the significant delay in updating the MAEO maps in Victorian Planning Schemes to reflect the most recently approved ANEF contours.[5]

8.24 Until 26 October 2021,[6] since its introduction on 14 May 2007, the MAEO was applied to land based on the ANEF contours in the 2003 Melbourne Airport Master Plan.[7] This was despite the existence of updated and approved ANEF contours contained in both the subsequent 2013 and 2018 Melbourne Airport Master Plans.

8.25 This results in a fundamentally unfair outcome where certain buildings were not required to be constructed to comply with the relevant Australian Standard under the Scheme despite being identified within the relevant ANEF contours in subsequent 2013 and 2018 Melbourne Airport Master Plan, in turn, warranting the application of the MAEO.

8.26 While it may be said this outcome arose as a consequence of the inaction of the Victorian Government, Council submits it should nonetheless be redressed as part of this compensation scheme within prescribed eligibility parameters for buildings within the ANEF contours based evidence assessing the severity of impact.

8.27 Specifically, Council submits owners of dwellings and other buildings accommodating sensitive land uses should be compensated for the necessary attenuation works required to achieve compliance with the relevant Australian Standard.

Class 5

8.28 Class 5 comprises dwellings and buildings accommodating sensitive land uses:

8.28.1 included in the MAEO at the time they were constructed;

8.28.2 in turn, constructed in compliance with the noise attenuation measures required by the Australian Standard in accordance with clause 45.08-2 of the MAEO; and

8.28.3 proposed to be removed from the MAEO as a result of the proposed third runway.

8.29 This arises as a result of the proposed shortening in length of the existing east-west runway (by approximately 346 metres at the western end to 1,940m) to facilitate constructing the third runway and ensure the two do not conflict.[8] This will restrict aircraft movements currently using the east-west runway and reduce consequential noise impacts.

8.30 Despite this:[9]

8.30.1 Figure 9-2 in the preliminary draft Master Plan shows the long-term layout (beyond 2042) including a fourth runway in an east-west direction south of the existing east-east runway; and

8.30.2 Section 9.2.2 states the Master Plan seeks to protect an extension of the existing east-west runway up to 3,500 metres in length.

[5] Applying in the Brimbank, Hume, Melton, Moreland, Moonee Valley and Whittlesea municipalities.
[6] See planning scheme amendment VC173.
[7] See planning scheme amendment VC30.
[8] Page 141.
[9] Page 143.

8.31 While these properties may be potentially removed from the application of the MAEO as a result of the proposed third runway, it is very likely they will be re-introduced in the MAEO in the context of the long-term proposal (albeit in some 20 years time).

8.32 This class differs from the others insofar as in these instances, the necessary attenuation measures are already implemented (as a result of the requirement contained in the MAEO).

8.33 It follows, there may be no need to retrofit insulation measures but instead, owners of dwellings and other buildings used for sensitive uses should be fairly and reasonably compensated for the attenuation measures already undertaken.

8.34 As a result of the proposed third runway, the MAEO may be removed from approximately 236 properties within the Brimbank municipality. Council has not yet determined how many of these 236 properties fall into Class 5 (i.e. dwellings or other buildings used for sensitive uses).

8.35 Council appreciates the difficulty in quantifying the value of this financial contribution where these works were undertaken variously since at least the MAEO's introduction on 14 May 2007 and possibly even the former Airport Environs Overlay's introduction on an interim basis on 27 May 1992.

8.36 This will likely need to be determined on a case-by-case basis, with the alternative being a set sum is determined and provided to the relevant landowner on receipt of evidence of the noise attenuation measures previously undertaken.

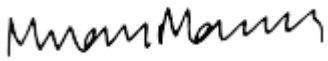
CONCLUSION

8.37 For the reasons advanced above and in reliance of the NHRA prepared by Tonkin + Taylor, Council submits there is both a sound policy rationale and need to compensate sensitive land receivers adversely affected by both existing and future aircraft noise.

8.38 Council submits the framework for compensation should be provided either by means of a NAP or other forms of compensation to owners of dwellings and buildings accommodating sensitive land uses (i.e. schools, places of worship, childcare centres and hospitals) adversely affected by aircraft noise associated with Melbourne Airport.

8.39 Council submits the noise targets established by WHO for aircraft noise are compelling and authoritative and should be considered together with an evidence-based approach informed by experts when determining the noise targets.

8.40 Finally, Council submits the future growth of Melbourne Airport and the approval of the third runway must be conditional on implementing a compensation scheme including a NAP under the existing legislative framework.



Lawyers for Brimbank City Council
Marcus Lane Group

Liability Limited by Scheme approved under Professional Standards Legislation.

APPENDIX A – LEGISLATIVE FRAMEWORK

1. In 1995, the Federal Parliament passed the *Aircraft Noise Levy Act 1995* and the *Aircraft Noise Levy Collection Act 1995* (**principal legislation**) to give effect to the Sydney Airport Noise Amelioration Program.

2. The history in which the SANAP arose is useful in understanding the introduction of the principal legislation:

3. In November 1991, the then Government granted approval to the Federal Airports Corporation to proceed with construction of a third runway at KSA. That approval was accompanied by a series of recommendations by the then Minister for the Environment, who recommended a noise management plan be prepared along with other environmental reports.

4. The noise management plan[10] recommended remedial measures to deal with aircraft noise around KSA as well as airport operational measures such as the use of standard flight paths.[11] The recommendations included:

   4.1 Voluntary acquisition of residences and churches in highest noise zone (40 ANEF) and re-zoning of the land for non-residential use.

   4.2 Voluntary sound insulation for existing schools, colleges, hospitals, child care centres, health care centres and churches with noise exposure exceeding 25 ANEF.

   4.3 Voluntary sound insulation for existing residences with noise exposure exceeding 25 ANEF, with measures to be adopted depending on the results of a pilot study. Treatment would generally be offered progressively, beginning with residences having the highest noise exposure.

5. In broad terms, the principal legislation empowers the Minister for Infrastructure, Transport and Regional Development to declare a 'qualifying airport'. An airport is a ‘qualifying airport’ at a particular time if:[12]

   5.1 at that time there is:

      5.1.1 a public building within a 25-unit contour shown on an Australian Noise Exposure Forecast (**ANEF**) previously prepared for the area around the airport for a date after that time; or

      5.1.2 a residence within a 30-unit contour shown on an ANEF previously prepared for the area around the airport for a date after that time; and

   5.2 the Commonwealth is funding at that time, or has funded before that time, a NAP for the airport.

6. The declaration is made by notice in the Commonwealth Gazette for a specified period.

7. Among other things, the rate of levy must be struck in a way that ‘as far as practicable’:[13]

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[10] See Noise Management Plan Final Report for Sydney (Kingsford-Smith) Airport by Erm Mitchell McCotter October 1994.
[11] See Noise Management Plan Final Report for Sydney (Kingsford-Smith) Airport by Erm Mitchell McCotter October 1994.
[12] Section 6, *Aircraft Noise Levy Collection Act 1995.*
[13] Section 7(4), *Aircraft Noise Levy Collection Act 1995.*

7.1 the adjusted levy liability for an airport at any given time does not exceed the Commonwealth expenditure on the NAP for the airport up to that time; and

7.2 the ratio of the adjusted levy liability for an airport to the Commonwealth expenditure on the NAP for the airport is ultimately the same for each leviable airport.

8. When an airport is declared leviable, the costs of a noise attenuation policy may be recovered by an aircraft noise levy imposed on jet aircraft using that airport.

9. Airlines generally recoup the cost from passengers.

APPENDIX B - INTERNATIONAL AND NATIONAL EXAMPLES OF NAPS

AUSTRALIAN EXAMPLES

Sydney Airport

Sydney Airport Noise Amelioration Program:[14]

1. The Noise Amelioration Program was a Commonwealth program implemented in 1994 and instigated by the construction of a new parallel runway.

2. The purpose of the program was to acquire properties voluntarily and provide financial assistance for the noise insulation of residential and institutional buildings (such as schools, hospitals, churches and child-care centres) in areas affected most severely by aircraft noise associated with Sydney's Kingsford-Smith Airport.

3. Costs for the program were recovered via a levy on aircraft landings since 1995. The levy was charged based on the noise characteristics of each aircraft and applied irrespective of whether the aircraft operated on national or international routes or was carrying passengers.

4. Most airlines chose to apply a charge of $3.40 per passenger.

5. The levy continued to apply until the costs associated with the program were fully recovered.

6. The program involved:

   6.1 voluntarily acquiring residential properties and a church within the 40 ANEF contour;

   6.2 assistance to insulate residences within the 30 ANEF (with design targets of 50dB(A) in bedrooms and 60dB(A) in other living areas of the house excluding bathrooms and laundries; and

   6.3 insulating public buildings (i.e. schools, hospitals, churches) within the 25 ANEF contour.

7. The following program 'elements' and 'objectives' were established:

   Property acquisitions - Voluntarily acquire all residences, churches and child-care centres in the ANEF 40 contour zone by the end of 1996 or as agreed.

   Schools insulation - Insulate schools and colleges within the ANEF 25 contour zone to AS20213.

   Child-care centres insulation - Insulate child-care centres within the ANEF 25 contour zone to AS2021.

   Hospitals and health-care facilities - Insulate hospitals and health-care centres within the ANEF 25 contour zone to AS2021.

   Insulation of churches - Insulate churches in the ANEF 25 contour zone to AS2021 or best endeavours within cost-cap budget.

[14] Sydney Airport Noise Amelioration Program (anao.gov.au) and RESIDENTIAL INSULATION SCHEME AROUND SYDNEY AIRPORT (conforg.fr).

Residential insulation - Provide financial and technical assistance for the insulation of residences within the ANEF 30 contour zone.

8. The system was initially overseen by the Department of Transport and Regional Development; however, the business unit was sold to a private sector buyer in 1997.

9. The steps for the work on each residence are summarised as:

   9.1 External aircraft noise level for each house was determined, having regard to the AS 2021 (*Aircraft Noise Intrusion – Building Siting and Construction*, Standards Australia 1999) and based on information on flight paths, aircraft types etc.

   9.2 Each home was provided with an information package.

   9.3 A 'scoper' inspected each house to determine the extent of works to be done.

   9.4 Taking into consideration the home owners' choice and standard specifications, the scoper prepared a scope of works.

   9.5 The homeowner obtained three quotations.

   9.6 The lowest quote from an acceptable limit was accepted and the work undertaken to a maximum of $50,000 (as at 2000).

   9.7 Inspections were undertaken and in some instances, noise level measurements to determine the extent of noise reduction.

10. The key measures included:

    10.1 providing ducted air-conditioning;

    10.2 external doors by replacement and/or seals;

    10.3 external walls by blocking vents and openings;

    10.4 windows by replacement and/or secondary glazing; and

    10.5 roof/ceiling by soft fibre insultation and loaded vinyl.

11. By 2000, 70% of the eligible homes were treated resulting in total expenditure of $317 million with an estimated final cost of $400 million.

12. The levy was terminated in 2010, with the final works beginning in 2012, and concluding by 2013.

Adelaide Airport

Adelaide Airport Noise Amelioration:[15]

13. The Adelaide Airport Noise Amelioration program (**AANA program**) was a $63 million program established by the Commonwealth Government in 2000 to fund installing noise insulation for eligible residences and public buildings in the vicinity of Adelaide Airport.

14. The project involved implementing noise insulation treatments to approximately 600 residential dwellings within the 30 and 35 Australian Noise Exposure Concept (**ANEC**) noise contours as well as 5 selected public buildings within the 25 ANEC noise contours.

[15] Master-Plan-Chapter-13-Aircraft-Noise.pdf (adelaideairport.com.au), page 225 and Aircraft Noise Discussion Paper (westtorrens.sa.gov.au), page 11. NJ00176-Masterplan_FA_Chap05.pdf (adelaideairport.com.au)

15. Most of the residential buildings eligible for noise insulation treatment were single dwellings built between 1920 and 1970, with a number of multi dwelling units (medium density houses) constructed between 1960 and 1970.[16]

16. It was based on aircraft noise level contour data provided by the Federal Airports Corporation and amelioration treatment guidelines developed from the Sydney Airport Noise Insultation Program.

17. Residential properties in the ANEI 30 contour and public buildings (schools, places of worship, day care centres and hospitals) in the ANEI 25 contour were eligible for assistance under the programs.

18. The noise insulation scheme was funded by a Commonwealth levy on passengers in place until 2010.

19. During the scheme's operation, the Commonwealth Government reported on progress to the Adelaide Airport Consultative Committee on a regular basis. This mechanism provided feedback to the airport and all stakeholders on the scheme's implementation.

20. The Commonwealth Government announced the final project under the noise insulation scheme in May 2013.

INTERNATIONAL EXAMPLES

London City Airport

Sound Insulation Scheme[17]

21. The Airport operates a three tier Sound Insulation Scheme offering sound insulation treatment to eligible residential properties falling within a specific range of noise: Tier 1, Immediate Tier and Tier 2.

22. **Tier 1**:

    22.1 Tier 1 covers the widest geographical area. Properties within the 57 dB LAeq,16h contour (Tier 1) are eligible for works to achieve an average sound reduction of not less than 25 dB. Single glazed properties are offered either secondary glazing or thermal double glazing plus acoustic ventilators. Double glazed properties are offered acoustic ventilators.

    22.2 The eligibility daytime noise contour level of 57 dB LAeq,16h is more stringent than that used at other UK airports.

    22.3 Some local homes are not eligible for Tier 1 works as they were built inside the airport's noise contours after particular dates when the growth of the airport and its noise impact would have been known by developers, and so those developers were required to install adequate sound insulation during the property's construction.

23. **Intermediate tier**: The second tier was introduced in 2017 for properties within the 63 dB LAeq,16h noise contour. Eligible properties are offered either:

    23.1 Option 1: Secondary glazing and sound attenuating ventilators, with the installation managed by London City Airport; or

[16] Adelaide Airport Noise Insulation Program (acoustics.asn.au)
[17] Environment: Sound Insulation Schemes - London City Airport

23.2 Option 2: £3,000 (approx. $5,200 AUD) contribution towards the cost of installing high acoustic performance double glazing and sound attenuating ventilators, with the installation managed by the property owner, or resident with permission from the owner.

24. **Tier 2**: properties closest to the airport. Eligible properties within the 66 dB LAeq,16h noise contour (Tier 2) are offered a higher standard of noise reduction and, following the City Airport Development Programme, the scheme has now been enhanced to provide 100% of the cost of high performance double glazing.

Gatwick Airport

Northern Runway relocation[18]

25. A 2021 draft document proposes the following measures to be offered to properties in the proposed Inner and Outer Zones (to be further refined and developed, in view of consultation feedback):

Zone and definition	Summary of proposed insultation package
New Inner Zone - Leq 8 hr night 55dB contour (incorporating Leq 16hr daytime 63dB contour)	Residential properties within this zone will be offered noise insulation in the form of replacement acoustic glazing or internal secondary glazing to all windows, acoustic ventilators and blinds to noise sensitive rooms (bedrooms, sitting rooms, dining rooms and studies), and replacement doors to noise sensitive rooms if necessary. Additionally, the offer includes acoustic upgrading of bedroom ceilings where practicable if they are found to be allowing more noise intrusion than the closed acoustic glazing provides.
New Outer Zone - Leq 16 hr 54dB contour	The New Outer Zone boundary covers a larger area and encompasses the existing Noise Insulation Scheme (**NIS**). Residential properties within this zone will be offered acoustic ventilators to noise sensitive rooms (as listed above). This allows windows to remain closed more easily in summer, which, with modern double glazed windows, increases the sound attenuation of the window by approximately 15 to 20dB. For properties with older single glazed windows, double glazed windows will be offered to noise sensitive rooms in addition to ventilators to ensure equivalent levels of protection.

26. Additionally:

[18] Microsoft Word - 210819 NIS FINAL.docx (gatwickairport.com).

26.1 A new **Schools Noise Insulation Scheme** is also proposed for all schools with noise sensitive teaching spaces within the forecast 2032 Leq 16 hr 51 dB noise contour. Where schools are concerned aircraft noise is affecting teaching, each classroom area will be surveyed to assess the effects of all types of noise including local road traffic. Noise insulation measures could include improved glazing and acoustic fresh air ventilation and the airport will work with the school to deliver a suitable noise insulation package if found to be required.

26.2 A home relocation assistance scheme is also proposed to offer home owners the option to move from the areas most affected by the highest noise levels from the project. Home owners newly within the Leq 16 hr 66 dB noise contour as a result of the Northern Runway Project coming into operation, would be offered a package to assist them in moving.

27. The airport is now considering feedback, along with further environmental and modelling assessments, ahead of submitting a planning application.

Edinburgh Airport

Edinburgh Airport Noise Insulation Scheme[19]

28. Households without double glazing in the 63dB and greater noise contours of the airport who haven't previously benefited from the scheme before, are entitled to apply for:

28.1 free secondary glazing to fit existing windows;

28.2 a 50% contribution to standard double glazed PVCu replacement windows;

28.3 a 50% contribution to high specification double glazed PVCu replacement windows, specially designed to reduce noise levels, or a combination of these options; or

28.4 a 50% contribution for replacing glass sealed units (glass only keeping existing window frames).

29. Properties already fitted with double glazing and do not want it replaced, can arrange for a free home survey to be carried out to identify whether the home's current insulation qualities can be improved.

30. Eligible households could also be entitled to ventilation and loft insulation free of charge as part of the scheme.

London Southend Airport

Sound and Thermal Insulation Grant Scheme[20]

31. Properties falling within the 63dB LAeq 16 hr noise contours qualify for inclusion in the Sound and Thermal Insulation Grant Scheme.

32. This scheme was introduced to offer sound attenuation to homes identified as falling within the 63dB LAeq 16hr noise contour. Qualifying homeowners can apply for either:

32.1 100% of the cost of installing secondary glazing to the habitable rooms; or

32.2 50% of the cost of installing primary double glazing to the habitable rooms; and

[19] NoiseLab (casper.aero)
[20] London Southend Airport: Noise Insulation Scheme - Newview (newviewhomes.co.uk)

32.3 100% of the cost of installing loft insulation of a type at least 270mm so as to improve the sound attenuation of the qualifying property

33. The airport offers to sound insulate up to two living rooms and all bedrooms up to a maximum of habitable rooms (i.e. not including bathrooms, conservatories, hallways or kitchens (unless used as a dining area)) in total under the scheme.

34. The homeowner may add rooms or upgrades to the PVC-U windows offered within the scheme at their own cost.

San Francisco International Airport

Noise Insultation Program[21]

35. San Francisco International Airport (**SFO**) offers acoustical improvements to qualifying homes through its Noise Insulation Program (**NIP**). SFO's NIP was the first of its kind in the United States.

36. Since 1983, more than 15,000 properties have been treated to install windows, doors, and ventilation systems for eligible homes.

37. The total program expenditure to date exceeds $194 million.

38. Through the NIP, SFO provides acoustical improvements to single-family residential properties located inside the 65-dB noise contour or a specific area where the average daily aircraft noise level is equal to or greater than 65 decibels as designated by the FAA.

Heathrow Airport

Current noise insulation schemes[22]

39. Quieter Homes Scheme:

    39.1 The Quieter Homes Scheme provides practical support to homeowners most affected by aircraft noise at Heathrow.

    39.2 Heathrow independently assesses each home to determine which noise insulation measures will be most effective and pay the full cost of carrying out the work.

    39.3 This may include loft and ceiling insulation, double-glazing or external door replacement.

    39.4 Residents eligible for the scheme pay nothing for any recommended soundproofing home improvements.

40. Community Buildings Scheme:

    40.1 Heathrow funds noise insulation for community buildings exposed to medium to high levels of aircraft noise.

    40.2 The scheme pays for buildings to make noise-insulating modifications such as double-glazing, replacement windows and ventilation.

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[21] Sanfrancisco Insightfull (flysfo.com)

[22] https://www.heathrow.com/company/local-community/noise/what-you-can-do/apply-for-help/noise-insulation-schemes#:~:text=Heathrow%20funds%20noise%20insulation%20for,glazing%2C%20replacement%20windows%20and%20ventilation.

40.3 The scheme applies to noise-sensitive buildings around Heathrow that are exposed to a medium to high level of noise (within the 2002 63 dB Leq noise contour).

40.4 Eligible buildings are those in widespread use within the community, where people spend long periods of time, or where they are vulnerable. These include hospitals, nursing homes and hospices, schools and colleges, registered nurseries, libraries and community halls.

Airport Expansion Consultation[23]

41. The Airport Expansion Consultation ran from 18 June until 13 September 2019 and gave interested stakeholders the opportunity to provide feedback on Heathrow's proposals for the future layout of the airport, including the proposed new runway and other airport infrastructure such as terminals and road access.

42. The Heathrow Airport Expansion Consultation developed discretionary property compensation schemes for owners or occupiers of land which may need to be acquired, or may be affected by expansion.

43. There comprise five policies applying within certain areas:

43.1 **Interim Residential Property Policy** – covers:

43.1.1 Compulsory Purchase Zone (**CPZ**) applying to land to be acquired; and

43.1.2 a Wider Property Offer Zone (**WPOZ**) comprising land outside the CPZ within close proximity to the proposed new boundary of the airport that could be affected by activities even though they are not required for the project.

43.2 **Interim Policy for Agricultural Land and Property** - sets out the approach for owners of agricultural land together with associated farmhouses and other farm buildings.

43.3 **Interim Commercial Property Policy** - sets out the approach for larger commercial interests as well as an offer for those with small business interests.

43.4 **Interim Property Hardship Scheme** - operates in relation to residential, agricultural and small business properties, where owners have a compelling need to sell their properties before they are able to under an Interim Property Policies, but have been unable to do so on the open market.

43.5 **Interim Professional Fees Policy** - sets out the approach to professional fees incurred in association with the compulsory acquisition process.

44. A separate noise insulation policy is intended for eligible properties that will be most affected by noise during construction and operation of the expanded airport. This comprises 3 schemes:[24]

44.1 Scheme 1 – for eligible properties affected by aircraft noise, a full package of sound insulation to habitable rooms;

44.2 Scheme 2 – for eligible properties to address noise from construction, road or rail sources;

[23] *Heathrow Airport Expansion – Consultation Document,* June 2019, Airport Expansion Consultation, page 95.
[24] *Heathrow Airport Expansion – Consultation Document,* June 2019, Airport Expansion Consultation, page 79.

44.3 Scheme 3 – a £3,000 (approx. $5,200 AUD) contribution to a package of sound insulation treatment.

Belfast International Airport

Sound Insulation Grant Scheme[25]

45. This SIGS offers grants towards the cost of installing secondary glazing or high acoustic performance double glazing, loft insulation and, in certain circumstances, acoustic treatment to doors and contributions towards the purchase of window blinds.

Frankfurt Airport

Passive noise abatement protection[26]

46. Households may make claims for passive noise abatement protection for their homes in the framework of the Passive Noise Protection Program. These noise abatement protection measures are intended to reduce the noise level within buildings.

47. Within the framework of the current 'Passive Noise Abatement' program, corresponding measures are being brought forward beyond the statutory regulations and are given extra budgetary resources from the Regional Fund.

48. The budget comprises some 150 million euros for the Passive Noise Abatement Program and 265 to 2570 million euros for the Regional Fund. The Regional Fund is part of the "Alliance for Noise Abatement 2012", launched on 29 February 2012.

49. The program differentiates between 4 protected zones, created in compliance with the applicable limit values shown in the noise protection laws. The noise protection areas comprise:

    49.1 2 daytime protection zones;

    49.2 1 night-time protection zone; and

    49.3 since 2013, one area covered by the Regional Fund.

'Casa' program:[27]

50. As part of its voluntary 'Casa' program, Fraport AG, the owner and operator of Frankfurt Airport either bought residential properties flown over at especially low altitudes, i.e. beneath 350 metres or compensated the owners financially.

51. The application deadline for the program was on 1 October 2014.

52. This program offered an alternative to homeowners who had purchased or built a property before the plans about the airport's expansion were discussed and who now found their house under the entry line to the airport.

53. Within the context of the noise-abating package of measures 'Together for the Region - Alliance for Noise Abatement 2012' Fraport AG significantly upgraded the Casa program in 2012.

54. Altogether the volume of measures taken within the Casa program amounted to over 100 million euros.

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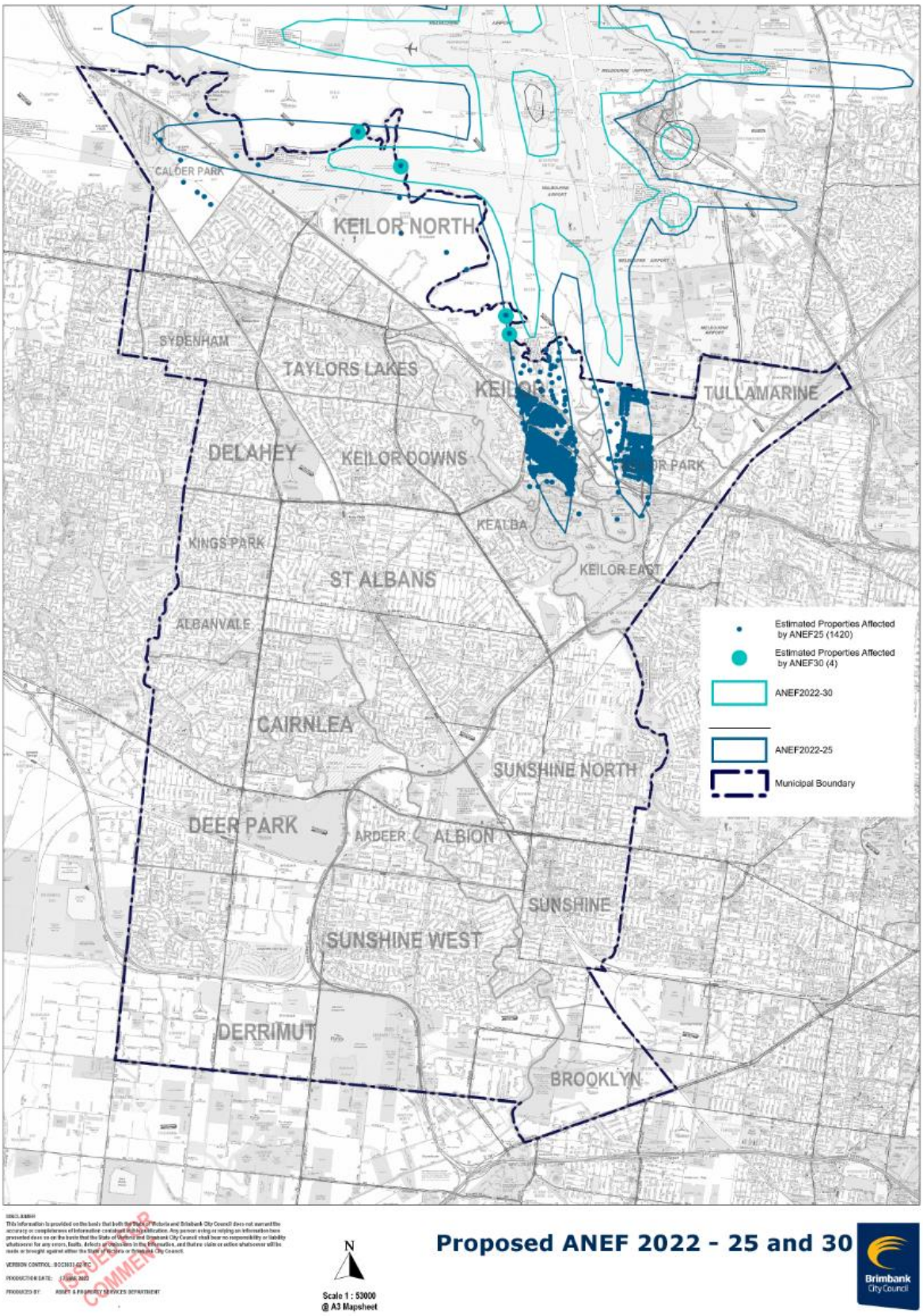
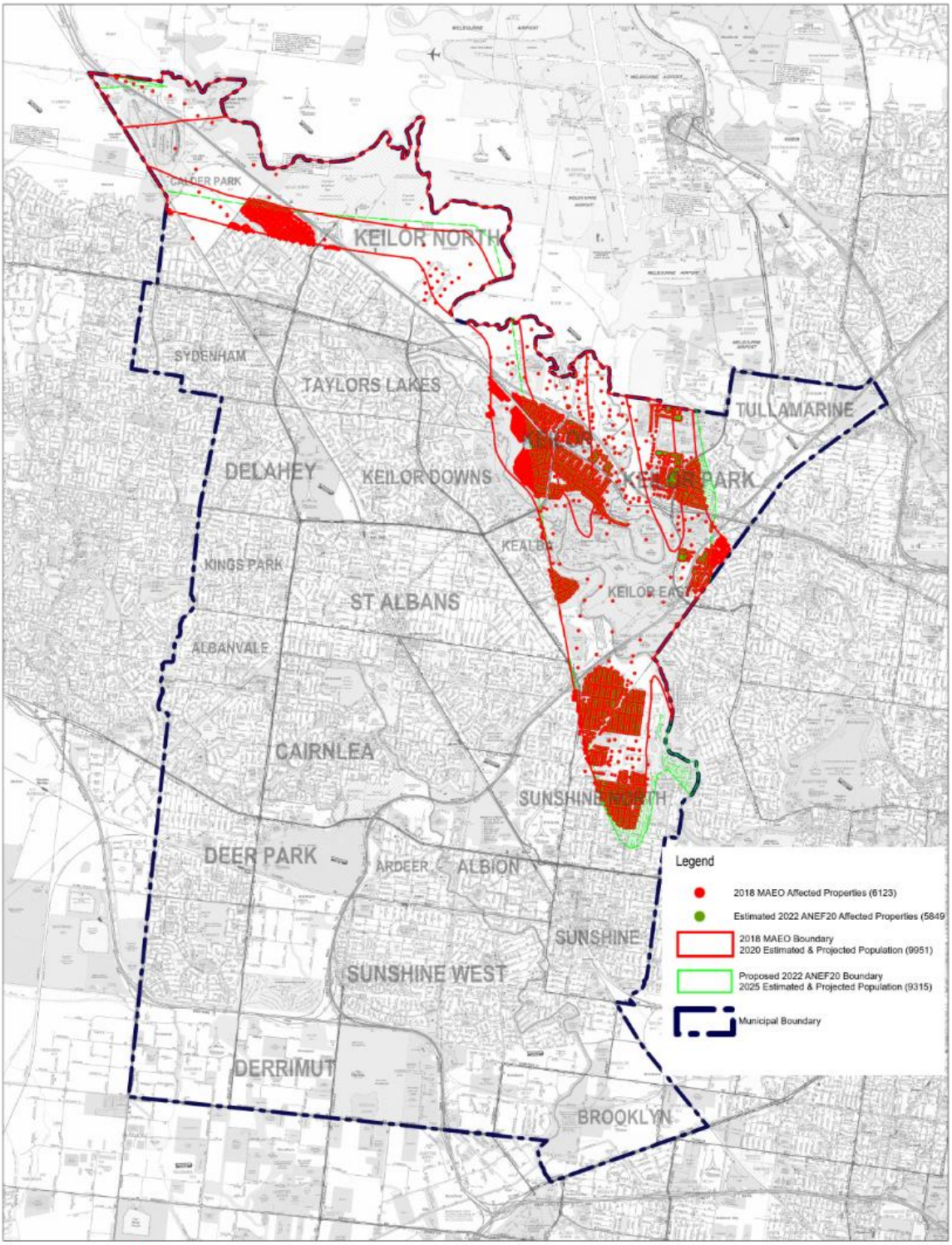
[25] belfast-international-airport-sigs-v2.pdf (belfastairport.com)
[26] https://www.fraport.com/en/environment/noise-abatement.html
[27] https://www.fraport.com/en/environment/noise-abatement.html

APPENDIX C - PROPERTIES WITHIN THE 2022 ANEF 25 AND 30 CONTOURS IN BRIMBANK MUNICIPALITY



APPENDIX D - PROPERTIES WITHIN THE 2022 20 ANEF CONTOUR (NOT INCLUDED IN THE 2018 ANEF CONTOURS)



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MAEO 2018 & Proposed ANEF 2022

Brimbank City Council

SUBMISSION

ON BEHALF OF BRIMBANK CITY COUNCIL

Preliminary draft Melbourne Airport 2022 Master Plan and Major Development Plan

Submission considering human rights

14 April 2022

INTRODUCTION

1. This submission is made in response to the preliminary draft 2022 Master Plan and preliminary draft Major Development Plan (**Draft MDP**) currently on exhibition.

2. These documents relate to Melbourne Airport's proposed third runway to run parallel to the existing north-south runway (**third runway**).

3. From the outset, Council submits:

   3.1 humans have a right to enjoy a safe, clean, healthy and sustainable environment;

   3.2 such environmental rights are necessary for effective human rights protection; and

   3.3 the human rights of those persons (including children) who are subject to unreasonable interference occasioned by aircraft noise should be considered by the Commonwealth and their health and well-being should be ensured and integrated into decision making when determining whether to approve the Draft MDP and any conditions which ought apply.

4. At the end of World War II, reconstructing the economy and respecting the fundamental freedoms were the central concerns of Europe and the then international community. The Preamble to the *1950 Convention for the Protection of Human Rights and Fundamental Freedoms* states that those freedoms 'are the foundation of justice and peace in the world'[1].

5. Environmental issues and noise pollution in particular were not yet a priority at that point in history.

6. Nevertheless, the need to protect the environment was affirmed and its link with human rights forged in the 1960's and 1970's. At the global level, the *Declaration on the Human Environment* adopted at the UN at the Stockholm Conference in 1972, proclaims in its Preamble that[2]:

   > [b]oth aspects of man's environment, the natural and the man-made, are essential to his well-being and to the enjoyment of basic human rights and the right to life itself.

7. Principle 1 of the Declaration emphasises the mutual nature of that relationship, stating:

   > Man has the fundamental right to freedom, equality and adequate conditions of life, in an environment of a quality that permits a life of dignity and well-being, and he bears a solemn responsibility to protect and improve the environment for present and future generations[3].

ENVIRONMENTAL PROTECTION IS NECESSARY FOR EFFECTIVE HUMAN RIGHTS PROTECTION

8. Council submits human rights are a relevant consideration when determining whether to approve and in what manner the Draft Master Plan 2022 and Draft MDP.

9. The *Charter of Human Rights and Responsibilities Act 2006* (**Charter**) imposes an obligation on Victorian public authorities (including Council) to give proper consideration to

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[1] Convention for the Protection of Human Rights and Fundamental Freedoms, 4 November 1950, Preamble; Schuman Declaration of 9 May 1950.
[2] UN Conference on the Environment, Stockholm, 5 to 16 June 1972; Declaration on the Environment, 16 June 1972, Preamble, recital 1.
[3] UN Conference on the Environment, Stockholm, 5 to 16 June 1972; Declaration on the Environment, 16 June 1972, Preamble, Principe 1.

human rights in decision making and act compatibly with the 20 substantive human rights contained in the Charter[4].

10. Council recognises the Charter does not apply to the Commonwealth when making administrative decision (as in this case).

11. However, Australia is a party to seven core international human rights treaties. Of these, a number of human rights embodied and protected in those treaties are 'engaged' in this context. Council urges the Commonwealth to assess the environmental impacts and take into account its human rights obligations (as embodied in those international human rights treaties) when considering aircraft noise as part of proposed third runway. The substantive human rights are identified in **Appendix A** and addressed in further detail below.

12. The European Commission and the European Court of Human Rights (**ECHR**) has produced a wealth of case-law enshrining the principle that the effective protection of the rights secured under these treaties (and the European conventions embodying them) required a high-quality environment. The right to life[5], the right to respect privacy and family life[6] and the protection of property[7] were all conducive to opening up to environmental issues. The right to environmental protection is now established through the intermediary of these existing rights.

13. The European cases (referred to above) have often involved issues associated with pollution such as noise, gas emissions, smells and other similar types of nuisance[8]. In these cases, the State Actors were required to take action, reduce or put an end to the pollution. The competing interests were balanced. It was determined the measures adopted must be 'reasonable and adequate' in order to strike a fair balance 'between the competing interests of the individual and of the community as a whole'.[9] In assessing the reasonableness of the measures, the ECHR has granted State Actors some discretion in 'deciding on local needs and contexts'[10].

14. This balancing of interests can work in both directions. Considering the environment is a matter of general interest[11], the enjoyment of specific rights may be restricted[12]. To that effect, the ECHR has found that '[f]inancial imperatives and even certain fundamental rights, such as ownership, should not be afforded priority over environmental protection considerations'[13].

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[4] See section 38 of the Charter.
[5] Article 6 of the International Covenant on Civil and Political Rights.
[6] Article 17 of the International Covenant on Civil and Political Rights, Article 16 of the Convention on the Rights of the Child and Article 22 of the Convention on the Rights of Persons with Disabilities.
[7] Article 17 of the Universal Declaration of Human Rights.
[8] See, for example, *Powell and Rayner v. the United Kingdom*, judgment of 21 February 1990; *López Ostra v. Spain*, judgment of 9 December 1994; *Giacomelli v. Italy*, judgment of 2 November 2006; and *Borysiewicz v. Poland*, judgment of 1 July 2008.
[9] See *Hatton and Others v. the United Kingdom*, Grand Chamber, judgment of 8 July 2003, § 98, and *López Ostra v. Spain*, judgment of 9 December 1994, §§ 55-58.
[10] Ibid.
[11] See, for example, *Valico S.R.L. v. Italy*, judgment of 21 March 2006, decision on admissibility.
[12] See, for example, Fredin v. Sweden, judgment of 18 February 1991, and *Pine Valley Developments Ltd and Others v. Ireland*, 29 November 1991.
[13] See *Hamer v. Belgium*, judgment of 27 November 2007, § 79; see also *Lazaridi v. Greece*, judgment of 13 July 2006, § 34; *O'Sullivan McCarthy Mussel Development Ltd v. Ireland*, 7 June 2018; and *Yaşar v. Romania*, 26 November 2019.

SCOPE AND MEANING OF THE RIGHT TO PRIVACY

15. The most significant human right to be considered in determining whether to approve the Draft Master Plan 2022 and Draft MDP is the right to privacy.

16. There can be no doubt this right is 'engaged' and must be considered.

17. The right is protected in Article 17 of the International Covenant on Civil and Political Rights (**ICCPR**). It reads:

> 1. No one shall be subjected to arbitrary or unlawful interference with his privacy, family, home or correspondence, nor to unlawful attacks on his honour and reputation.

18. The right is also to be found in Article 16 of the Convention on the Rights of the Child. It reads:

> 1. No child shall be subjected to arbitrary or unlawful interference with his or her privacy, family, home or correspondence, nor to unlawful attacks on his or her honour and reputation.

19. The meaning of 'privacy', while enigmatic and hard to define, has been given a very wide meaning and defined widely as 'the right to be left alone'[14].

20. A further definition comprises 'freedoms from unwarranted and unreasonable intrusions into activities that society recognises as belonging to the realm of individual autonomy[15].

21. As far as the ICCPR is concerned, the meaning of privacy for the purpose of Article 17 is not yet thoroughly defined in either the General Comment on Article 17 or the case law.

22. Notwithstanding, a body of case law considering this human right has emerged, particularly as applies to arbitrary interference of aircraft noise pollution.

23. In a significant judgment, the Grand Chamber of the ECHR in *Hatton and others v United Kingdom,* 2 October 2001 (***Hatton***) held the United Kingdom's policies (as they were at that time) on night-time flying from Heathrow Airport breached the privacy rights of nearby residents. While modest compensation was awarded, the judgment indicates more rigorous research on both the effects of night-time flights and their economic justification is needed in order to comply with the Convention for the Protection of Human Rights and Fundamental Freedoms. These aspects of the ECHR's decision have wider implications for government and other public bodies where public policy considerations are invoked to justify infringement of rights.

24. In *Hatton***,** eight residents, living close to Heathrow Airport, claimed violation of their human rights under Articles 8 and 13 of the Convention for the Protection of Human Rights and Fundamental Freedoms. The noise levels experienced by the applicants were such as to prevent sleep to them and their families, leading to health problems. In some cases, they had been forced to move away from the airport. Aircraft noise prevented the applicants from falling asleep, delaying this till after 1am and they were woken early, typically around 5am, but sometimes earlier. Some applicants wore earplugs to help sleep at night and in one case this resulted in an ear infection. Disturbance had increased after 1993, despite an assurance it would not do so. The applicants were successful before the ECHR and were awarded damages and costs.

25. It is clear from the above case, the right to privacy is not absolute.

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[14] S.D Warren and L.D Brandeis, 'The Right to Privacy' (1890) 4 *Harvard Law Review* 193, 195.
[15] S.E Wilborn, 'Revisiting the Public/Private Distinction: Employee Monitoring in the Workplace' (1998) 32 *Georgia Law Review* 825, 833.

26. The right to privacy raises questions about the reasonableness of the interference with the right to privacy occasioned by the aircraft noise for persons including children living and working under the flight path or in close proximity experiencing adverse impacts.

27. While the Commonwealth is free to interfere by law with the privacy of individuals and children, this is only permissible provided the right is limited by proportionate measures designed to achieve a valid end. In this way, the right has been held to incorporate notions of reasonableness and proportionality. It cannot be arbitrary.

28. Article 17(1) of the ICCPR prohibits States from themselves invading a persons' privacy. There are also positive obligations within Article 17. The Human Rights Committee's *General Comment 16* states the right to privacy is required to be guaranteed against all such interferences and attacks whether they emanate from State authorities or from natural or legal persons. The obligations imposed by this article requires the State to adopt legislative and other measures to give effect to the prohibition against such interferences and attacks as well as to the protection of this right.

APPLYING THE RIGHT TO PRIVACY

29. Council submits the starting position is to understand whether:

    29.1 the aircraft noise 'interference' is lawful or not, that is to say whether it is authorised by statute;

    29.2 even if lawful, whether it is nonetheless arbitrary[16];

    29.3 if so, whether the interference is reasonable, proportionate and a justifiable limitation on the right to privacy; and

    29.4 if not, whether any conditions or restrictions can or ought be imposed resulting in a reasonable, proportionate and justifiable limitation on the right to privacy.

30. Section 91 of the *Airports Act 1996* requires the decision maker to consider the effect the development will likely have on noise exposure levels.

31. There is no legislative criteria to evaluate aircraft noise in Australia. In the absence of any specificity or standard by which to assess the aircraft noise impacts authorised by law, there is some discretion to the decision maker.

32. Council understand the industry practice is to consider changes within the Australian Noise Exposure Concept (**ANEC**), N70 day and evening, N70 24hours, N60 night and N60 24hours.

33. In Victoria, planning controls managing airport noise use the Australian Noise Exposure Forecast (**ANEF**). The ANEF is a measure of annual noise exposure and considers (among other things) average daily noise, noise intensity (level), duration and tonal content.

34. The ANEF does not readily translate to an understandable noise level in decibels – the standard measure for how 'loud' something is. N contours have become useful tools in assessing aircraft noise. The most commonly used N contours are N70, N65, N60 and N60 night. These contours can be determined for any given number of events.

35. While the ANEF is a tool for land-use planning purposes, the fact of the matter is in Victoria, the area where potentially intrusive noise impacts may occur is far greater than that shown within the ANEF contours.

[16] An interference may be authorised by statute and 'lawful' but still be arbitrary.

36. The noise sensitive receivers in the area around Melbourne Airport includes dwellings and other buildings used for sensitive land uses including schools and other educational facilities, hospitals and other health care facilities, libraries, nursing homes, churches and child care centres.

37. The Draft MDP makes clear the 'benefits and impacts of the proposal are assessed in terms of changes in noise exposure at these locations, and in terms of the number of receivers experiencing a given level of noise exposure'[17].

38. Plainly, the Draft MDP does not assess:

38.1 the actual impacts or likely noise exposure to be experienced by the sensitive noise receivers; and

38.2 in turn, whether the impact of aircraft noise on affected sensitive noise receivers is reasonable or not requiring a judgment about the impacts.

39. Council submits the noise and health impact assessment is seriously deficient.

40. But putting aside the fact there is insufficient information to assess the likely noise and its impact such as to render the proposal not supportable, there is no analysis or evidence supporting the assertions and conclusions advanced by Melbourne Airport. There is a fundamental lack of rigour and independence adopted in the draft MDP.

41. In human rights terms, even where some discretion should be afforded to the decision maker when determining the effect the proposal will likely have on noise exposure levels, Council submits there is a very real risk the aircraft noise interference will not be acceptable and will amount to an arbitrary interference.

41.1 This is particularly the case where:

41.1.1 the measurement of the extent of exposure to aircraft noise at a certain level is unknown; and

41.1.2 the extent to which that exposure is having an adverse effect is unknown including evidence of health and well-being.

42. It is, respectfully, difficult to go on and evaluate whether, even if the noise interference is arbitrary, whether it is a reasonable, proportionate and justifiable limitation on the right to privacy.

43. This is the case where there is an absence of any independent expert economic evidence or health impact evidence advanced in the Draft MDP and no exercise has been undertaken balancing those conflicting interests and rights.

44. Excessive noise occasioned by aircraft may amount to a breach privacy for the sensitive noise receivers in the absence of a well-reasoned and sound regulatory framework and associated guidelines to properly assess sleep disturbance and health impacts.

45. Moreover, it is not clear what attenuation measures are advanced or any conditional approval allowing for a proportionate and reasonable response, such that the interference with the right will not amount to an arbitrary interference with the right to privacy.

46. In all, there is a fundamental lack of evidence, as a threshold issue.

47. Council urges the decision maker, when determining whether to approve the Draft MDP to take the human rights of noise sensitive receivers into consideration including:

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[17] See Section C3.5.4 of the Major Development Plan – Part C.

47.1 unreasonable interference with the right to privacy; and

47.2 resultant health risks associated with environmental noise including annoyance, sleep disturbance, increase in ischaemic heart disease, cognitive impairment and psychological effects including anxiety and depression.

48. Council also urges the decision maker to consider more broadly the relationship between aviation noise and people's health and well-being. Council submits such relationship should be better understood and better integrated into decision-making.

49. The measures to safeguard and maintain, protect and support Melbourne Airport's ongoing operations must be balanced with the needs of affected communities surrounding the airport.

50. The rights of the airport and its operations are not absolute.

51. They do not trump the human rights of noise sensitive receivers where adverse impacts are experienced.

CONCLUSION

52. Council submits the requirements of environmental protection and human rights are now in the interests both of the individual and of the national community as a whole, and the decision maker take them into account in determining whether to approve or in what manner the draft Master Plan 2022 and draft MDP.

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APPENDIX A - SEVEN CORE INTERNATIONAL HUMAN RIGHTS TREATIES

Australia is a party to seven core international human rights treaties. These are:[18]

No.	Name of core international human rights treaties which Australia has ratified	Entry into force date (for Australia)	Potentially relevant articles
1.	International Covenant on Civil and Political Rights	13 November 1980 (except Article 41: 28 March 1979)	**Article 6:** 1. Every human being has the inherent right to life. This right shall be protected by law. No one shall be arbitrarily deprived of his life. **Article 17:** 1. No one shall be subjected to arbitrary or unlawful interference with his privacy, family, home or correspondence, nor to unlawful attacks on his honour and reputation.

[18] International human rights system | Attorney-General's Department (ag.gov.au)

2.	International Covenant on Economic, Social and Cultural Rights	10 March 1976	**Article 12:** 1. The States Parties to the present Covenant recognize the right of everyone to the enjoyment of the highest attainable standard of physical and mental health. 2. The steps to be taken by the States Parties to the present Covenant to achieve the full realization of this right shall include those necessary for: … (b) The improvement of all aspects of environmental and industrial hygiene… **Article 13:** 1. The States Parties to the present Covenant recognize the right of everyone to education. They agree education shall be directed to the full development of the human personality and the sense of its dignity, and shall strengthen the respect for human rights and fundamental freedoms. …
3.	Convention on the Rights of the Child	16 January 1991	**Article 3:** 1. In all actions concerning children, whether undertaken by public or private social welfare institutions, courts of law, administrative authorities or legislative bodies, the best interests of the child shall be a primary consideration. **Article 6:** 1. State Parties recognize that every child has the inherent right to life. 2. State Parties to ensure to the maximum extent possible the survival and development of the child. **Article 16:** 1. No child shall be subjected to arbitrary or unlawful interference with his or her privacy, family, home or correspondence, nor to unlawful attacks on his or her honour and reputation.

			2. The child has the right to the protection of the law against such interference or attacks. **Article 24:** 1. States Parties recognize the right of the child to the enjoyment of the highest attainable standard of health and to facilities for the treatment of illness and rehabilitation of health. States Parties shall strive to ensure that no child is deprived of his or her right of access to such health care services. **Article 27:** 1. States Parties recognize the right of every child to a standard of living adequate for the child's physical, mental, spiritual, moral and social development. 2. The parent(s) or others responsible for the child have the primary responsibility to secure, within their abilities and financial capacities, the conditions of living necessary for the child's development.
4.	Convention on the Rights of Persons with Disabilities	16 August 2008	**Article 22 – Respect for privacy** 1. No person with disabilities, regardless of place of residence or living arrangements, shall be subjected to arbitrary or unlawful interference with his or her privacy, family, home or correspondence or other types of communication or to unlawful attacks on his or her honour and reputation. Persons with disabilities have the right to the protection of the law against such interference or attacks. 2. States Parties shall protect the privacy of personal, health and rehabilitation information of persons with disabilities on an equal basis with others.
5.	International Convention on the Elimination of All Forms of Racial Discrimination	30 October 1975 (except Article 14: 28 January 1993)	N/A
6.	Convention on the Elimination of All Forms of Discrimination against Women	27 August 1983	N/A

7.	Convention against Torture and Other Cruel, Inhuman or Degrading Treatment or Punishment	7 September 1989	N/A