Attachment to item number 9.2

Runway 30 RNP-AR Flight Path: Online Survey ofCommunity Reactions to Aircraft Noise

Runway 30 RNP-AR Flight Path: Online Survey of Community Reactions to Aircraft Noise

Compiled by Andrew Terhorst PhD

20 March 2024

Carlton River, Primrose Sands & Forcett Flight Path Opponents Group

1 Introduction

In November 2019, Airservices Australia introduced two new arrival flight paths for Runway 30 at Hobart Airport: “Runway 30 RNP-AR” and “Runway 30 RNAV”. These changes, marking a shift to greater reliance on satellite-based navigation, resulted in more precise and concentrated flight corridors. The “Runway 30 RNP-AR” flight path has jet aircraft passing over houses at altitudes under 3000’, significantly increasing aircraft noise for residents. This noise often exceeds 75 dB, causing considerable distress among the community.

While Airservices Australia highlights the benefits of satellite navigation, such as improved safety, reduced fuel consumption, and lower emissions, it downplays the adverse effects of increased noise on communities under these narrow flight corridors. Despite admitting its shortcomings in community engagement and noise impact predictions, Airservices Australia’s response to community complaints has been lacklustre. The organisation claims it is committed to addressing concerns through its airspace change program, yet the specifics of this program and its effectiveness remain unclear to many. This lack of transparency and what many perceive as the patronising attitude of Airservices Australia has fuelled residents’ frustration.

Amidst infrastructure upgrades at Hobart Airport and expected growth in air traffic, the Carlton River, Primrose Sands, and Forcett Flight Path Opponents Group conducted an online survey to gather and document community reactions to the noise increase. This report collates survey responses with broader flight path and noise abatement discussions, illustrating the community’s plight and exploring potential solutions for more harmonious aviation and residential coexistence. It calls on Airservices Australia to reevaluate its flight path strategies, putting community welfare ahead of operational and commercial priorities.

2 Online survey

2.1 Survey design

The online survey aimed to capture diverse viewpoints from people living beneath the flight path. While individuals more significantly affected by aircraft noise might be more inclined to participate, the survey was structured to mitigate bias and encourage widespread participation. Fundamental design principles included:

- Brevity: Keeping the survey concise to encourage participation.
- Neutrality: Crafting neutral questions to maintain objectivity.
- Diversity: Balancing with a blend of closed and open-ended questions.

This approach facilitated the collection of a wide range of insights and provided space for respondents to share their experiences in-depth, offering a more nuanced understanding of the community’s stance on aircraft noise. Refer to Appendix A for a list of items in the online survey.

2.2 Survey administration and data analysis

The survey was administered using a commercial platform called “Typeform”. Access to the survey was facilitated through a public URL link. While publicly shared links pose a risk of allowing individuals to complete the survey multiple times, potentially skewing the results, the chosen platform incorporates advanced security measures. These measures are designed to detect and prevent any attempts to bias the survey outcomes through repeated participation.

The URL link was shared via word-of-mouth, and flyers were delivered to households directly under the Runway 30 RNP-AR flight path. Flyers were also put up at local stores, and the link was shared through social media platforms, via the local council notice board, and by email. The survey was open for four weeks, from 20 February 2024 to 19 March 2024. The survey attracted more responses from individuals adversely affected by aircraft noise, introducing some response bias.

Survey responses were downloaded as a comma-separated variable file and read into a software package called “R” for data analysis. The analysis involved generating statistical plots and use of generative AI routines to summarise free-text responses. For the sake of transparency, the R code used in the analysis is listed in Appendix B.

3 Survey results

Figure 1 breaks down survey completions over time. Most of the survey responses were collected early on. Efforts to manipulate survey outcomes by submitting multiple entries were identified, with only the initial response considered for analysis. Of the 155 responses collected, 152 were deemed valid and included in the final analysis.

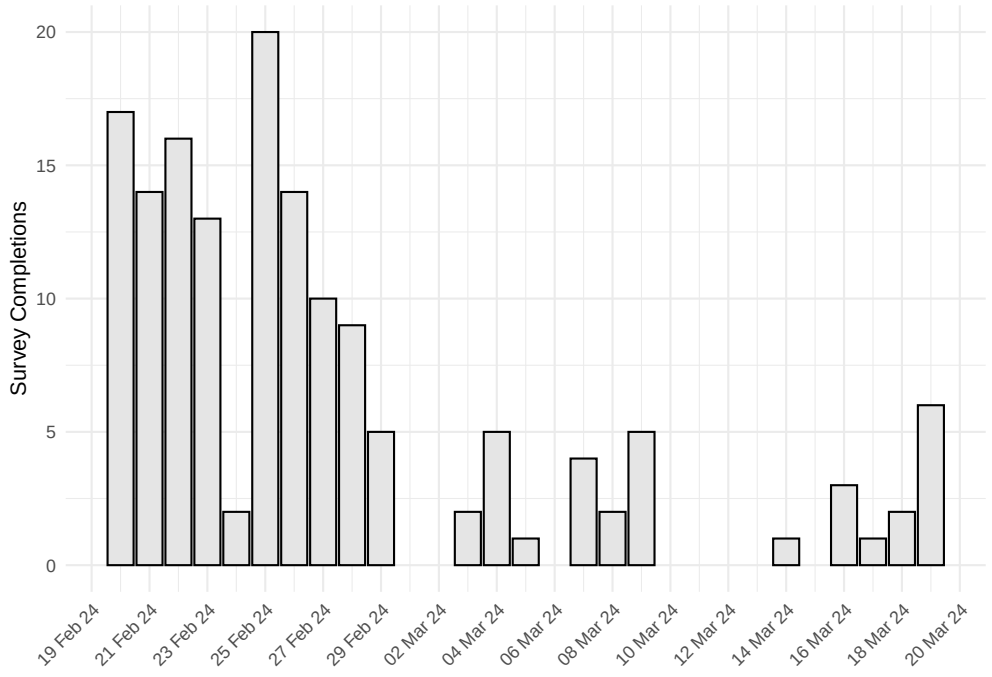

Figure 1: Survey completion rate.

Respondents were given the option to provide their contact details. Of the 152 responses analysed, 96 (63.2%) included contact details, a sign that respondents are keen to remain actively engaged with the aircraft noise issue (Figure 2).

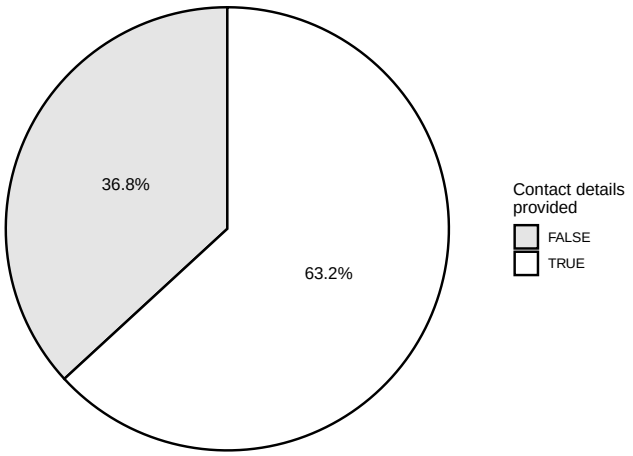

Figure 2: Proportion of respondents providing contact details.

3.1 Close-ended survey questions

Closed-ended survey questions limit respondents to predefined answers. However, the survey did allow participants to offer alternative responses in many instances. These additional responses are not represented in the statistical plots but were analysed independently.

3.1.1 Age demographic

Figure 3 shows that most respondents are older than 50. Over a quarter of respondents fall in the 60 to 69 age bracket. Responses to open-ended questions indicate that many of the respondents are retirees.

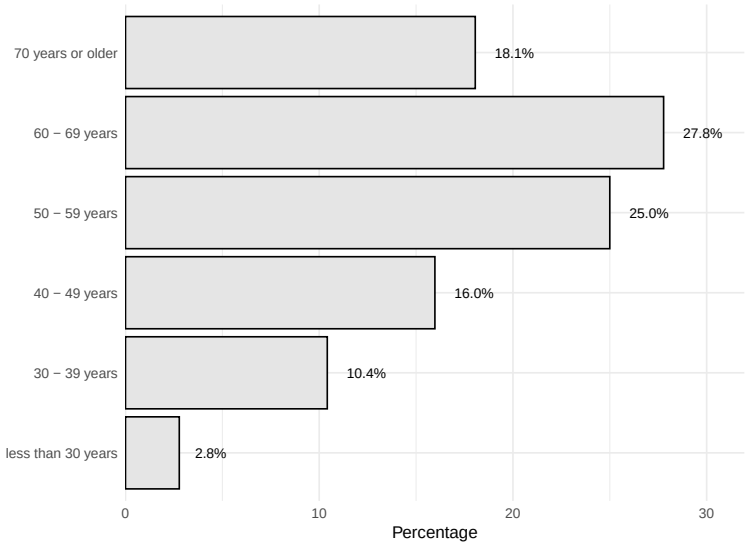

Figure 3: Which age category do you fall within?

3.1.2 Already resident before the introduction of new flight paths

Most respondents (76%) bought or moved into their current property before the new flight paths were implemented (Figure 4). From the responses to the open-ended questions, it is clear that many moved to the area to retire peacefully.

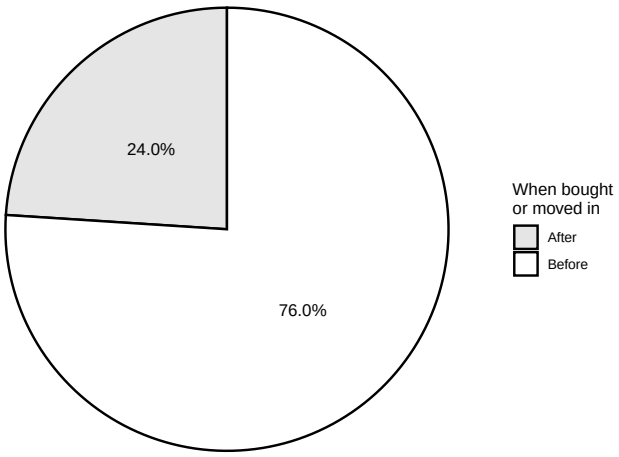

Figure 4: Did you purchase or move into this property before or after introducing the new flight paths in 2019?

3.1.3 Noise disturbance

Figure 5 shows that a significant number of respondents are disturbed by aircraft noise, with 45.9% reporting they are extremely disturbed and 23% disturbed. Less than 20% of respondents reported they were not disturbed by aircraft noise at all, suggesting a balanced representation in the survey responses.

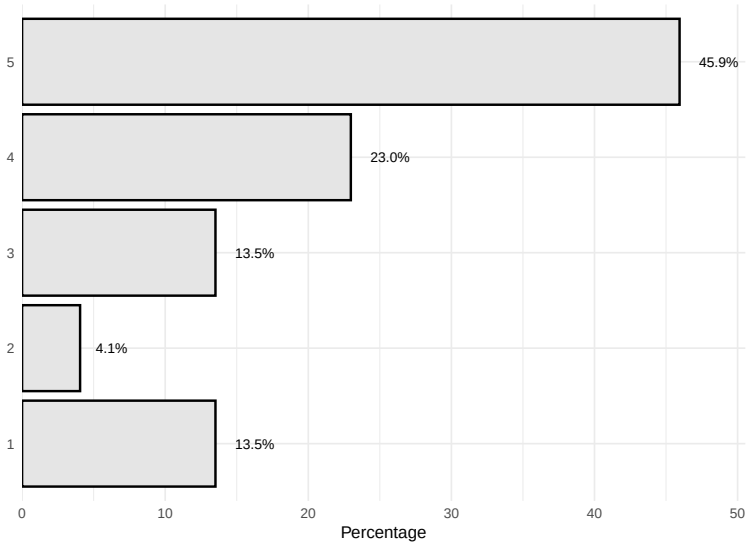

Figure 5: On a scale of 1 to 5, where one is 'Not at all disturbed' and five is 'Extremely disturbed', to what extent are you disturbed by aircraft noise?

3.1.4 Awareness of airport expansion plans

Awareness of the planned expansions to Hobart Airport is mixed (Figure 6). While many respondents ($\sim$ 50%) are aware of runway upgrades to accommodate wide-bodied aircraft and the anticipated increase in flight movements, a significant number of respondents are not fully aware of these plans (17.6% report they are not at all aware).

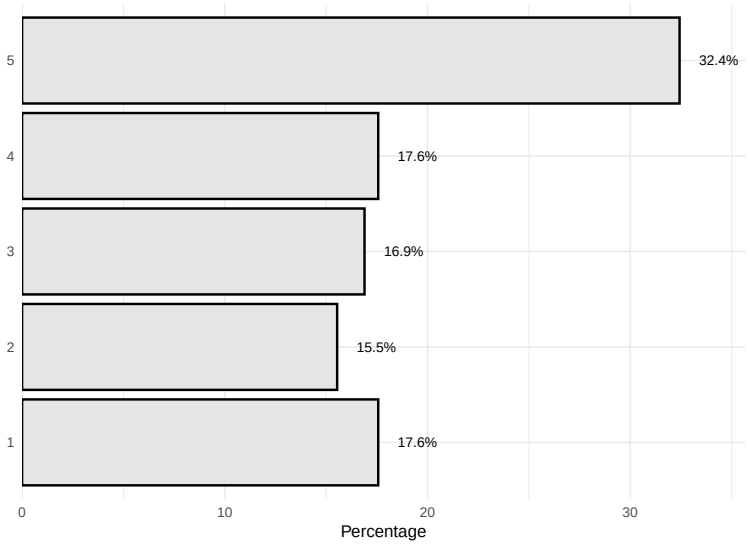

Figure 6: On a scale of 1 to 5, where one is 'Not at all aware' and five is 'Extremely aware', to what extent are you aware of the runway upgrades at Hobart Airport to accommodate larger aircraft such as the Boeing 777 or Airbus A330 and the projected 40% increase in flight arrivals?

3.1.5 Support for a curfew

A flight curfew is a regulated period during which commercial airline takeoffs and landings are restricted at an airport. This is usually enforced overnight to minimise noise pollution and

disturbance to residents living near the airport. Hobart Airport does not have any curfew at present.

Figure 7 shows that the majority of respondents strongly support a curfew (76.7%). Only 8.2% are strongly opposed to a curfew. Interestingly, the open-ended responses reveal a few of those opposed to a curfew still favour moving the flight path.

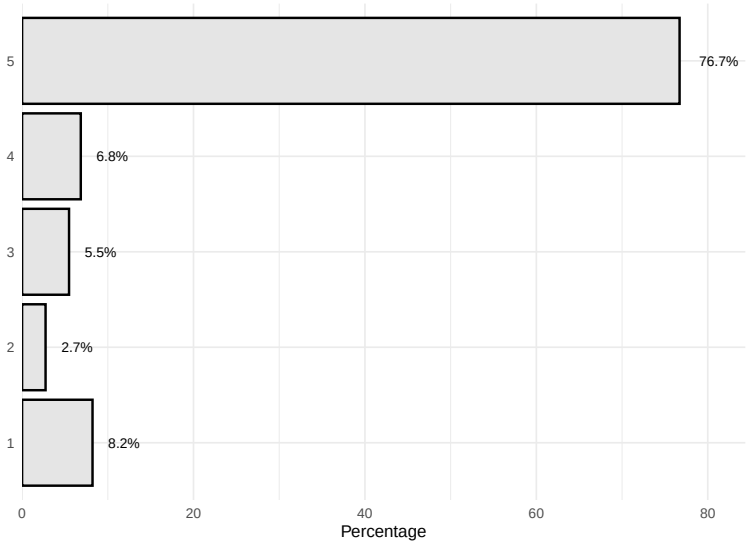

Figure 7: On a scale of 1 to 5, rate how strongly you feel we should have a curfew at Hobart Airport, where one is 'Strongly oppose a curfew' and five is 'Strongly support a curfew'.

3.1.6 Ongoing engagement with the aircraft noise issue

There is willingness to remain engaged with the aircraft noise issue. Figure 8 shows 42.9% of respondents are extremely interested and 21.8% fairly interested in attending community information sessions. This interest is reflected in the proportion of respondents who provided contact details (63.2%, see Figure 2).

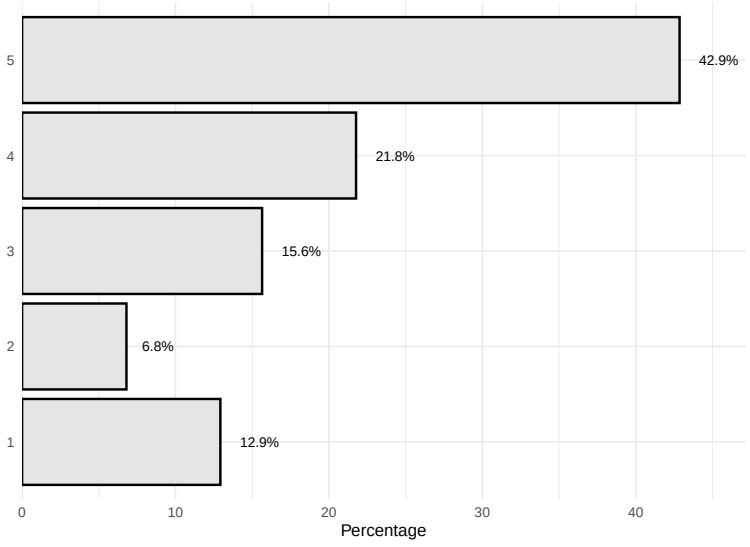

Figure 8: On a scale of 1 to 5, where one is 'Not at all interested' and five is 'Extremely interested', to what extent are you interested in engaging in community information sessions addressing aircraft noise?

3.1.7 Coping mechanisms

When asked what respondents do to cope with or mitigate aircraft noise, 24.3% of respondents indicated they keep their doors and windows closed, 15.3% report doing nothing, and 17.3% play music or use their radio or TV to mask aircraft noise (Figure 9). A small percentage (2.7%) seek professional help to cope with aircraft noise.

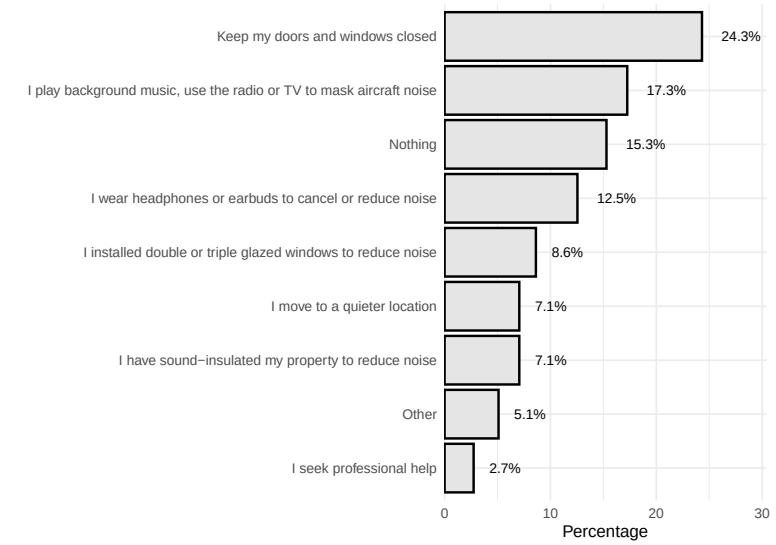

Figure 9: What do you do to cope with aircraft noise?

Figure 10 breaks down the number of coping mechanisms respondents employ to deal with aircraft noise. The majority (51.3%) use only one mechanism, whereas 40.7% or so use two or more strategies to cope with aircraft noise. People particularly sensitive to aircraft noise are more likely to use multiple coping mechanisms.

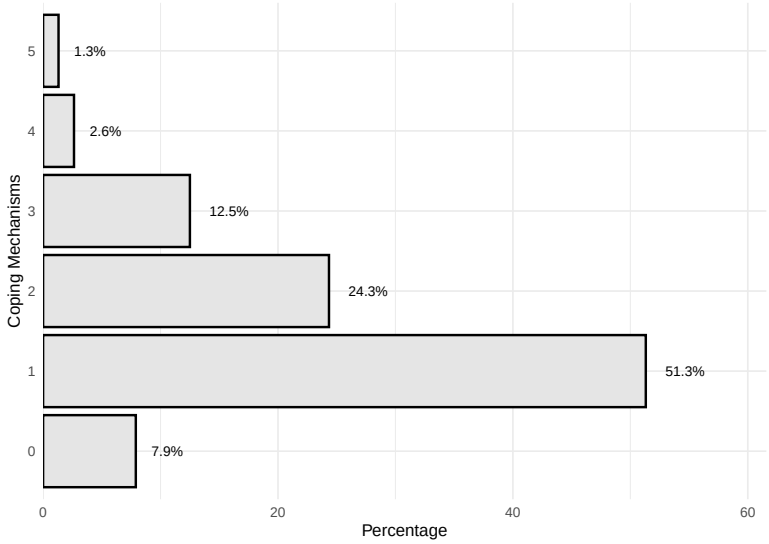

Figure 10: How many mechanisms do respondents use to deal with aircraft noise?

3.1.8 Seeking advice or complaining about aircraft noise

Regarding advice or complaints about aircraft noise, Figure 11 shows that respondents tend to get their information from neighbours (30.4%) or through online community groups (23.4%). A much smaller fraction of respondents take this issue further with local, state and federal government bodies.

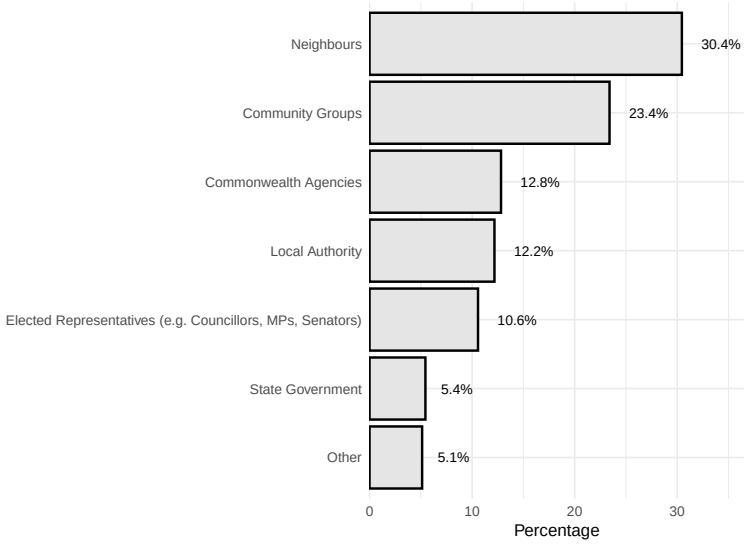

Figure 11: Regarding aircraft noise, who have you contacted to understand the flight path situation or complained about the noise?

A deeper dive into the data shows that 40.8% of respondents only use one channel to discuss aircraft noise (Figure 12). Of the remainder, 12.5% of respondents do not discuss the issue with anyone, while a small percentage of respondents use two or more channels of communication (1.3% use every available channel of communication).

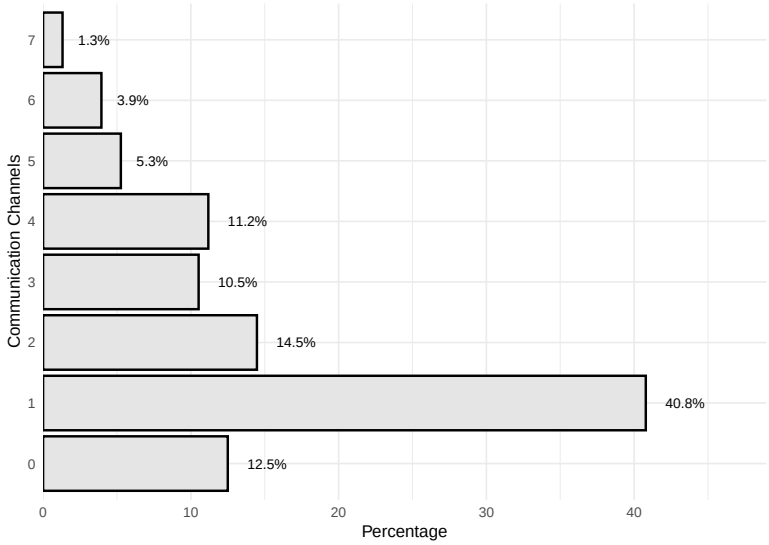

Figure 12: How many channels of communication do people use?

3.1.9 Keeping abreast of things

Figure 13 shows respondents prefer to rely on email newsletters (34%) or social media groups (33.2%) for information about community sessions addressing aircraft noise. There is less appetite for letter drops and reliance on community notice boards. A very small number of respondents indicated that they did not want to be bothered by this matter.

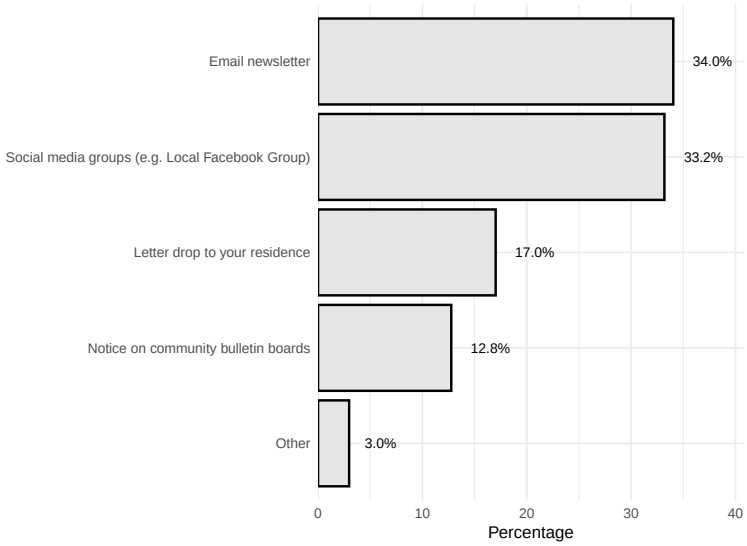

Figure 13: How would you like to stay informed about community sessions addressing aircraft noise?

3.2 Open-ended survey questions

Open-ended survey questions empower respondents to express their thoughts freely, providing personalised answers without being restricted to predetermined options.

3.2.1 Impacts

Respondents were asked to explain how the noise of aircraft passing over their property impacted their lives, daily routines, lifestyles, and mental or physical health.

Responses indicate aircraft noise significantly impacts the residents' lives, daily routines, lifestyles, and mental and physical health. The noise disrupts sleep patterns, causing sleep deprivation and leading to severe migraines, anxiety, and depression. It also affects residents' ability to work from home, interrupting meetings and calls. The noise is often so loud that it drowns out in-person and phone conversations and disrupts peaceful activities such as gardening or watching TV. Aircraft noise also unsettles pets, causing them distress. The constant noise leaves residents feeling on edge and anxious, with some reporting increased blood pressure. It is particularly disruptive for those with health conditions such as hypersensitivity to noise, post-traumatic stress disorder (PTSD) and attention-deficit hyperactivity disorder (ADHD). Noise pollution has led to some residents needing medication to help them sleep and has caused a decline in mental health. Aircraft noise also impacts the residents' enjoyment of their properties, with many reporting a loss of privacy and tranquillity in their yards. Some residents are concerned about the potential decrease in property value due to the noise. The noise is particularly disruptive

for those who moved to the area for its peace, with some residents considering selling their properties due to the constant noise. Some residents feel that the noise is an invasion of their privacy and are frustrated about the lack of consultation about the flight path changes. In summary, aircraft noise profoundly impacts residents' sleep, work, health, and enjoyment of their properties. Below are some quotes from the free text responses on the perceived impacts of aircraft noise.

> "I have lived in the area for over 40 years. I have stayed in the area as I enjoy the peaceful lifestyle. It is now to the point where you can't leave any windows or doors open due to the noise. Planes can still be heard above TVs and radios and inhibits sleep, which has required me to commute on occasions fatigued, which is extremely dangerous to myself and other road users. This has led me to try using white noise to lessen the impact of the noise disturbance from planes but [this] has had little effect. I also find the noise of the planes distracting when working. I work from home for a government call centre and at times, the sound of the planes makes it difficult to hear my client or concentrate on their query, requiring me to ask them to repeat themselves or having to place them on hold until the noise has passed. In summary, my house was not under a flight path when we bought the land and built, if it was, we wouldn't have bought it. There was no consultation regarding the flight path being changed to go over my property, if there had been, I would have strongly objected. The flight path over my property has affected my anxiety levels to the point I am now under doctor supervision".

> "We live in Carlton River directly under the flight path. The planes flight paths are so low over Carlton River that we are able to read the text on the belly of JetStar planes. The noise levels are intolerable especially at night when the noise levels intensify that you can't hear the TV, conversations or a person on the phone. I have noticed several flights coming in as late as 1am and have been woken up by such flights causing disruption to my sleep. I have a disability which already causes sleep issues so having late flights coming in so low is not helpful. My concern that as the airport increases its flights that these noise levels will be constant and completely destroy the tranquillity of the area. The flight paths should be moved to over the water not directly over residential areas particularly when the flight paths are so low."

> "My property is at the base of Carlton Bluff and aircraft noise seems to be amplified in this area. Any joy that I have gardening has been diminished and whilst having conversations with neighbours and passers-by when aircraft are navigating overhead, voices have to be raised substantially to be heard. Our once peaceful suburb has been shattered by ASA's decision to move the flight path to this populated area."

> "We moved here for tranquillity and peacefulness, now we have planes flying directly over our home constantly daily so loudly and low that conversation is not audible when this occurs. That is only one aspect. My partner has PTSD and my children ADHD I work in mental health, the impact of constant noise exacerbates their well-being and mine as a carer."

> "I like to have a bit of peace and quite. The planes fly directly over us at low altitude. They start at 6 in the morning and continue all day till late. I counted 37 come over us once. It impacts my lifestyle and the peacefulness. This typical of a large organisation bullying a lower socio-economic community hoping they will just wear it. I refer to Dunalley who complained and campaigned till the flight path was moved. This was mainly due to the big money men in this area. Flight path needs to be shared around."

> "I live at the crest of the hill on Sugarloaf Rd. The noise is so loud you stop mid-sentence and kick off again in 30 seconds. I go to work early and get up at 5.30am. There [are] flights

before that time. I go to bed early, 8.30pm, [and] there are flights incoming until past midnight. It's ridiculous."

"The noise limits the use of outside decks, entertainment areas, and just sitting and enjoying the sunshine."

"It doesn't [impact me]. Stop finding shit to whinge about. Put some earplugs in."

3.2.2 Livelihood

Respondents were asked if aircraft noise impacted their livelihood or ability to work.

Responses reveal the noise from aircraft significantly impacts the ability of residents to work, primarily due to sleep deprivation and the subsequent inability to concentrate. Aircraft noise is particularly problematic for those working from home, as it disrupts their focus and productivity. The noise is also disruptive for those who work night shifts and need to sleep during the day. Additionally, the noise is intrusive during work calls, with clients often hearing the noise in the background. The constant noise also causes stress, further impacting work performance. However, some respondents are retired or do not work and, therefore, do not experience a direct impact on their work but still suffer from disrupted sleep and a decreased quality of life. Some quotes from the free text responses on perceived impact on livelihood:

"I am a hospitality business professional. We planned to turn our farm into a wedding and events reception area but this is no longer suitable."

"Absolutely NOT. If this impacts on any-ones livelihood/ability to work, there is something wrong with their mental state."

"Yes, we breed horses and have ongoing issues with horses being spooked by planes. Eagles live on our property and have been displaced by frequent aircraft."

"Yes as stated previously, I work from home for a government call centre, the noise makes it difficult to concentrate on client queries requiring me to ask them to repeat themselves or place them on hold until the noise has passed."

"I work from home and being on [Carlton Bluff] I am directly under the flight path. I have to pause anything I am doing via voice or audio each time a plane flies over. Sundays seem to be the worst. I have to pause the TV often at night to allow for the noise. It is extremely noisy. I did not buy a house on the beach to have a flight path moved directly above my property."

"It certainly adversely affects our lifestyle and ability to exist peacefully, which is exactly why we purchased a property here in Primrose Sands."

"I work from home, everyday, as a contract bookkeeper, it is very hard to concentrate on this type of work with aircraft noise almost directly overhead and only 2,500 feet above. I have to close the windows when a client rings and still get asked by the client 'what's that noise?' Aircraft noise certainly interrupts my concentration!!"

3.2.3 Preferred outcomes

Respondents were asked if they could have it any way they wanted about aircraft noise and what outcomes or actions they would like to see happening.

Most survey respondents want the flight paths to be changed so that aircraft noise does not impact any community. They suggest that planes should fly over water or across less populated areas rather than residential properties. If these options are not possible, they propose a curfew at Hobart Airport to provide respite from the noise, particularly during the night. Some respondents also suggest that planes should fly at a higher altitude to reduce noise, and that noise baffles should be included on all planes (noise baffles reduce jet engine noise by disrupting exhaust gas flows and using sound absorbent materials, effectively lowering the engine's overall noise output). A few requested regular published noise testing for affected residents. Some respondents, however, are content with the current flight paths and want to avoid early curfews. Other respondents also suggest financial compensation if the flight path remains in place. Below are some responses to the open-ended question on preferred outcomes:

> "I would prefer the flight paths be relocated to a less densely populated area. I am aware these options exist and do not understand why these changes can't be made immediately. If the flight paths stay as they are then at least a curfew should be introduced."

> "I would like to see the burden spread around not based on who's got the most impact and money. Everyone knows the planes need to land but the flight path should be spread among all communities not the communities where you thing you will have the least resistance."

> "Each household impacted should be individually consulted and be part of the rejection/approval process. Aircraft flight paths design is not being directly regulated by the government, this should change. These paths use the space and air above our houses and although they are a transport corridor they are not treated as such during the approval process. They should be lodging DAs (Development Applications) at the councils like everyone else does when building a house or a road and give council planners, planning authorities, and residents an opportunity to comment and approve or reject their proposals."

> "The flight paths moved over the water so that they are not over any residential areas especially when the flight paths are so low. If this is not completely possible at least move all night time flights to over the water, and daytime flights share the load to various residential areas so that areas may only be affected a couple of times a day by flights, rather than every two hours with a barrage of 3 planes coming in within a 20 minute period."

> "Balance of commercial, safety, and flight paths. The airport has existed for decades, so people should expect aircraft noise. Not so long ago aircraft flew down over Lewisham before a right turn onto final. If we keep pushing the flight path out beyond the expanding housing areas, the flight path will be down around Port Arthur. There is a direct correlation between flight paths and increased airfares!"

> "I want the flight path moved so it is not directly over my house. There is a vast amount of vacant farming land between Connollys Marsh and Dunally where there are very few houses. Planes would be at a higher altitude flying over this area therefore the few houses would not be severely impacted by noise. This would require a move of the flight path approximately 3 to 4 km as the crow flies to the east. It is pertinent to note, this is all the community has been

asking for since the first engagement meeting with Airservices Australia, a relocation of the flight path to this vacant farming land, which is not an unreasonable ask."

"This question is badly worded. I take it to mean what would be the best way to deal with this noise from our point of view. Move the air runway to over the water and farmland as mooted ... 3km east of where it is currently. It really is a no-brainer ... but of course we assume there are a few $'s to be made by the airlines who save $'s by coming in on a direct route ... i.e. above suburban homes at low altitudes."

3.2.4 Additional comments/closing remarks

Respondents were invited to provide additional comments or further questions at the end of the survey.

They expressed a range of concerns and frustrations about the impact of aircraft noise on their lives. Many respondents feel that the issue is not adequately addressed, with some predicting a future increase in noise due to larger planes and a lack of airport curfew. They express dissatisfaction with the lack of transparency and consultation from Airservices Australia and feel there needs to be consideration of alternative flight paths and better regulations to lessen noise impacts on the community. Some respondents regret purchasing properties in the affected area, stating they were unaware of the issue at the time of purchase. There are also concerns about the potential impact on local wildlife, particularly eagles. A few respondents, however, express indifference or enjoyment of the planes, and some suggest that living near an airport should come with the expectation of noise. Concerns about potential air pollution and its impact on rainwater tanks also exist. A significant number of respondents want the flight path shifted over to less populated areas or the ocean. Below are some closing remarks from respondents:

"As I have said, I'm at Carlton Beach and very close to the flight path, and it doesn't bother me or my family at all."

"The State govt obsession with tourism is the reason we are now under siege. When did the 'grand tour' of the idle rich become this appalling mass movement of people all over the place trying to have an 'experience'? People moved to TAS over 20 years ago to escape the chaos of the mainland or overseas countries. Now, thanks to our stupid politicians of ALL colours we are subjected to an ongoing assault on our lives, health and what makes Tasmania so special. Take a leaf from Venice."

"When we had the chance to leave/move away from Primrose Sands we took the chance as Runway 30 was horrible to live under and could not live there long term with this as it was."

"Please take the community's well-being seriously. There are alternative flight paths and regulations that can be considered that will have less impact on the community. There are more flights using the runway 30 flight path than was anticipated and consulted on with the community – this reflects a need to reconsider the decision of the number of flights using this path or the flight path altogether. I'd like to note that although I bought my property after 2019 - I bought in 2021 during [the Covid-19 pandemic] where there were fewer flights and the impacts in the area were less obvious. Had I known how many flights would travel overhead during normal conditions on the new flight path, I would have seriously reconsidered my decision to buy in this location – I do not say this lightly, as I love everything else about living in this area."

"Curfews! A more nuanced approach to managing the impact of aircraft noise! I live very close to the airport. The current flight path has reduced the impact for me but has seriously impacted many friends who live further away from the airport such as interrupting sleep and impacting their health and well-being, significant financial loss due to [selling of] land and having to back out of building plans and purchase elsewhere, reduced property values ..."

"The community consultation I went to was a joke and left me very very angry. The so called survey that you based the decision on to not trial the 3km East option was deeply flawed (or cynically and deliberately aimed at getting the result you wanted). Multiple choice options were limited and slanted toward getting people to agree to one of the options when all of them were unacceptable. There was no option to choose none of the above. It became quite obvious to those who attended the so called consultation that a company (Airservices Australia) who are directly responsible to the airlines should not be charged with ensuring people on the ground under the flight paths were heard considered and enabled to change decisions made by Airservices Australia."

"We are all on rainwater tanks in the approach area, and I am probably more concerned about the effects of air pollution from the aircraft engines contaminating what I drink and bath in!"

"I worry about our wedge-tailed eagles and sea eagles who fly over the flight path. Most of our sea eagles have relocated, but the wedge-tailed eagles regularly fly high in or over the flight path. Ironically, the aircraft fly directly over Sea Eagle Road and Wedgetail Street."

"I feel for the residents disturbed by the noise and fearful of more. How do decision makers better consider the impact on communities of business growth and how do we decide when the risk to livability is too high? Or is the mental and physical health of affected residents less important than business growth? What ongoing measures will help define and monitor compliance with optimal routes?"

"Keep the flight paths exactly where they are please, and do not have early curfews. My wife flies weekly and delayed flights due to curfews would mean additional nights and costs away from home."

"Primrose Sands, Connellys Marsh and parts of Dodges [Ferry], Carlton [are] poor area[s] and treated poorly as a result. No one cares because it's poor [people who are impacted]."

4 Key takeaways from the community survey

1. **Significant Noise Impact:** Residents are significantly disturbed by aircraft noise, affecting their daily lives, routines, and overall well-being.
2. **Insufficient Consultation and Underestimation of Impact:** The community feels that Airservices Australia did not adequately engage with them or accurately assess the noise impact.
3. **Community Concern Over Airport Expansion:** There is apprehension regarding future expansions of Hobart Airport, with fears of increased noise due to larger aircraft and more flights.

4. **Strong Support for a Curfew:** The overwhelming support for introducing a curfew at Hobart Airport reflects a community desire for regulatory measures to mitigate noise pollution, particularly during nighttime and early morning hours.

5. **Diverse Coping Mechanisms:** Residents' various strategies for coping with aircraft noise, ranging from physical modifications to their homes to white noise, background music, or radio, highlight the significant adaptations individuals are forced to make.

6. **Desire for Flight Path Alteration:** The predominant preference among survey respondents is for the flight path to be moved to less populated or uninhabited areas, indicating a strong consensus for a solution that minimises residential noise exposure.

7. **Willingness to Engage:** The community is keen to stay informed and engaged on the issue.

8. **Communication Preferences:** There is a preference for email newsletters and social media groups to stay informed on this issue.

9. **Varied Individual Experiences:** Open-ended responses reveal a spectrum of individual experiences with aircraft noise, from significant distress affecting mental and physical health to a minority of residents who do not find the noise bothersome.

10. **Call for Comprehensive Solutions:** The community seeks a holistic approach to noise management, including better consultation, more accurate impact assessments, and consideration of environmental and health effects.

Appendix A - Survey Questions

Item	Type	Description	Response option
1	Welcome	Please take the survey if you own, rent, or live in a property located in the Sorell Municipality that's under the aircraft flight path or close enough to hear aircraft noise...	Continue
2	Consent	Electronic Consent: By clicking on the "I agree" button below, you are indicating that you voluntarily agree to participate in this survey and that you are at least 18 years of age. You also understand that the data collected will be kept anonymous, that it will be used for research and advocacy purposes, and that we will keep you updated on the results.	I agree / I disagree
3	Question	Please enter the postcode of your property. This will give us some idea how close you are to current flight paths.	Postcode
4	Question	On average, how much time do you spend at this location?	Select one of the following options: - 90% of your time (if you have a disability, care for a newborn, are retired, you home-school your children, or work from home) - 80% of your time (if you work part time or study outside home, or are retired) - 70% of your time (if you work full time outside this location and commute to work) - 70% to 30% of your time (if you work more than full time outside of this location or travel often) - Less than 30% of your time (if this location is your place of work and not your home) - I don't live in this location. It is a lot/rental/under construction
5	Question	Did you purchase or move into this property before or after the introduction of the new flight paths in 2019?	Before / After
6	Question	On a scale of 1 to 5, where one is 'Not at all disturbed' and five is 'Extremely disturbed', to what extent are you disturbed by aircraft noise?	Choose a number between 1 and 5.
7	Question	On a scale of 1 to 5, where one is 'Not at all aware' and five is 'Extremely aware', to what extent are you aware of the runway upgrades at Hobart Airport to accommodate larger aircraft such as the Boeing 777 or Airbus A330 and the projected 40% increase in flight arrivals?	Choose a number between 1 and 5.

Item	Type	Description	Response option
8	Question	A flight curfew refers to a regulated period during which commercial airline take-offs and landings are restricted at an airport. This is usually enforced overnight to minimise noise pollution and disturbance to residents living near the airport. Hobart Airport does not have any curfew at present. On a scale of 1 to 5, rate how strongly you feel we should have a curfew at Hobart Airport, where one is 'Strongly oppose a curfew' and five is 'Strongly support a curfew'.	Choose a number between 1 and 5.
9	Question	Explain how the noise of aircraft passing over your property impacts your life, daily routine, lifestyle, and mental or physical health.	Free text.
10	Question	Regarding aircraft noise, who have you contacted to understand the flight path situation or complained about the noise?	Select one or more of the following options: - Neighbours - Community Groups - Local Authority - State Government - Commonwealth Agencies - Elected Representatives (e.g. Councillors, MPs, Senators)
11	Question	Does aircraft noise impact your livelihood/ability to work?	Free text.
12	Question	What do you do to cope with aircraft noise?	Select one or more of the following options: - Nothing - Keep my doors and windows closed - I have sound-insulated my property to reduce noise - I installed double or triple glazed windows to reduce noise - I wear headphones or earbuds to cancel or reduce noise - I play background music, use the radio or TV to mask aircraft noise - I move to a quieter location - I seek professional help
13	Question	On a scale of 1 to 5, where one is 'Not at all interested' and five is 'Extremely interested', to what extent are you interested in engaging in community information sessions addressing aircraft noise?	Choose a number between 1 and 5.
14	Question	How would you like to stay informed about community sessions addressing aircraft noise?	Select one of the following options: - Email newsletter - Letter drop to your residence

Item	Type	Description	Response option
			- Notice on community bulletin boards - Social media groups (e.g. Local Facebook Group)
15	Question	If you could have it any way you wanted about aircraft noise, what outcomes or actions would you like to see happening?	Free text.
16	Question	Any additional comments or questions?	Free text.
18	Question	Would you share your contact info for survey updates? Your name, email, or phone number won't be shared.	Optionally fill in the following information: - First name - Last name - Phone number - Email address
19	Closure	Thank you for sharing how aircraft noise affects you. We'll share our findings with you soon. Could you help us by sharing this survey with others in the Sorell area impacted by aircraft noise? We aim to reach 500 people during March - April 2024. Here's the link: URL. Your support is crucial in broadening our understanding and making a difference. Thank you for helping us spread the word!	Closing message for "I agree" to participate (end of survey).
20	Closure	We respect your decision. Please follow developments on social media, community bulletin boards, council notices, or by talking with your neighbours.	Closing message for "I disagree" to participate (early termination).

Appendix B - R code

```
##########################################
#
#             Aircraft Noise
#            Community Survey

# load requisite packages

require(tidyverse)
require(readr)
require(ggsci)
require(egg)
require(lubridate)

# read in survey data

responses <- read_csv("responses.csv")

# filter out multiple response attempts

check <- responses %>%
  group_by(`Network ID`) %>%
  count() %>%
  ungroup() %>%
  left_join(responses) %>%
  arrange(desc(n))

responses_filtered <- responses %>%
  mutate(date = as.Date(strptime(`Submit Date (UTC)`, "%Y-%m-%d %H:%M:%S"))) %>%
  group_by(`Network ID`) %>%
  arrange(date) %>%
  mutate(attempt = row_number()) %>%
  ungroup() %>%
  filter(!(`Network ID` == "a858d69af8" & attempt > 1))

# completion rates

responses_filtered %>%
  group_by(date) %>%
  count() %>%
  ggplot(aes(x = date, y = n)) +
  geom_col(fill = "grey90", colour = "black") +
  scale_x_date(date_breaks = "2 day", date_labels = "%d %b %y") +
  ylab("Survey Completions") +
  xlab("") +
  theme_minimal() +
  theme(axis.text.x = element_text(angle = 45, hjust = 1))

ggsave("completions.pdf", width = 7, height = 5, units = "in", dpi = 300)

# respondent age breakdown

responses_filtered %>%
  select(age = `Which age category do you fall within?`) %>%
  filter(!is.na(age)) %>%
  mutate(age = factor(age, levels = c("less than 30 years",
                                      "30 - 39 years",
                                      "40 - 49 years",
                                      "50 - 59 years",
                                      "60 - 69 years",
```

```
                                        "70 years or older"))) %>%
  count(age) %>%
  mutate(percentage = n / sum(n) * 100) %>%
  ggplot(aes(x = age, y = percentage)) +
  geom_col(fill = "grey90", colour = "black") +
  theme_minimal() +
  ylab("Percentage") +
  xlab("") +
  guides(fill = "none") +
  geom_text(aes(label = sprintf("%.1f%%", percentage)), hjust = -0.5, size = 3) +
  scale_y_continuous(expand = expansion(mult = c(0,0.15))) +
  coord_flip()

ggsave("age_cat.pdf", width = 7, height = 5, units = "in", dpi = 300)

# buy before or after

responses_filtered %>%
  select(when_bought = `Did you purchase or move into this property before or
      after the introduction of the new flight paths in 2019?`) %>%
  filter(!is.na(when_bought)) %>%
  mutate(when_bought = factor(when_bought)) %>%
  count(when_bought) %>%
  mutate(percentage = n / sum(n) * 100,
         label_position = cumsum(percentage) - (0.25 * percentage)) %>%
  ggplot(aes(x = "", y = percentage, fill = when_bought)) +
  geom_bar(stat = "identity", width = 1, colour = "black", lwd = 0.75) +
  coord_polar(theta = "y") +
  theme_void() +
  scale_fill_manual(values = c("grey90", "white")) +
  guides(fill = guide_legend(title = "When bought \nor moved in")) +
  geom_text(aes(label = sprintf("%.1f%%", percentage)),
            position = position_stack(vjust = 0.5), size = 4)

ggsave("when_bought.pdf", width = 7, height = 5, units = "in", dpi = 300)

# contact details

responses_filtered %>%
  select(`Phone number`, Email) %>%
  mutate(across(everything(), ~ ifelse(is.na(.), 0, 1)),
         contact = ifelse(`Phone number` == 1 | Email == 1, TRUE, FALSE)) %>%
  count(contact) %>%
  mutate(percentage = n / sum(n) * 100) %>%
  ggplot(aes(x = "", y = percentage, fill = as.factor(contact))) +
  geom_bar(stat = "identity", width = 1, colour = "black", lwd = 0.75) +
  coord_polar(theta = "y") +
  theme_void() +
  scale_fill_manual(values = c("grey90", "white")) +
  guides(fill = guide_legend(title = "Contact details \nprovided")) +
  geom_text(aes(label = sprintf("%.1f%%", percentage)),
            position = position_stack(vjust = 0.5), size = 4)

ggsave("contact_details.pdf", width = 7, height = 5, units = "in", dpi = 300)

# disturbance to residents

responses_filtered %>%
  select(disturbed = `On a scale of 1 to 5, where one is 'Not at all disturbed'
      and five is 'Extremely disturbed', to what extent are you disturbed by
      aircraft noise?`) %>%
  filter(!is.na(disturbed)) %>%
```

```
  mutate(disturbed = factor(disturbed)) %>%
  count(disturbed) %>%
  mutate(percentage = n / sum(n) * 100) %>%
  ggplot(aes(x = disturbed, y = percentage)) +
  geom_col(fill = "grey90", colour = "black", lwd = 0.75) +
  theme_minimal() +
  ylab("Percentage") +
  xlab("") +
  guides(fill = FALSE) +
  geom_text(aes(label = sprintf("%.1f%%", percentage)), hjust = -0.5, size = 3) +
  scale_y_continuous(expand = expansion(mult = c(0,0.1))) +
  coord_flip()

ggsave("disturbance.pdf", width = 7, height = 5, units = "in", dpi = 300)

# support for a curfew

responses_filtered %>%
  select(curfew = `A flight curfew refers to a regulated period during which
      commercial airline takeoffs and landings are restricted at an airport. This
       is usually enforced overnight to minimise noise pollution and disturbance
      to residents living near the airport.  \n\nHobart Airport does not have any
       curfew at present. On a scale of 1 to 5, rate how strongly you feel we
      should have a curfew at Hobart Airport, where one is 'Strongly oppose a
      curfew' and five is 'Strongly support a curfew'.`) %>%
  filter(!is.na(curfew)) %>%
  mutate(curfew = factor(curfew)) %>%
  count(curfew) %>%
  mutate(percentage = n / sum(n) * 100) %>%
  ggplot(aes(x = curfew, y = percentage)) +
  geom_col(fill = "grey90", colour = "black", lwd = 0.75) +
  theme_minimal() +
  ylab("Percentage") +
  xlab("") +
  guides(fill = FALSE) +
  geom_text(aes(label = sprintf("%.1f%%", percentage)), hjust = -0.5, size = 3) +
  scale_y_continuous(expand = expansion(mult = c(0,0.1))) +
  coord_flip()

ggsave("curfew.pdf", width = 7, height = 5, units = "in", dpi = 300)

# appetite for engagement

responses_filtered %>%
  select(engagement = `On a scale of 1 to 5, where one is 'Not at all interested'
       and five is 'Extremely interested', to what extent are you interested in
      engaging in community information sessions addressing aircraft noise?`) %>%
  filter(!is.na(engagement)) %>%
  mutate(engagement = factor(engagement)) %>%
  count(engagement) %>%
  mutate(percentage = n / sum(n) * 100) %>%
  ggplot(aes(x = engagement, y = percentage)) +
  geom_col(fill = "grey90", colour = "black", lwd = 0.75) +
  theme_minimal() +
  ylab("Percentage") +
  xlab("") +
  guides(fill = FALSE) +
  geom_text(aes(label = sprintf("%.1f%%", percentage)), hjust = -0.5, size = 3) +
  scale_y_continuous(expand = expansion(mult = c(0,0.1))) +
  coord_flip()

ggsave("engagement.pdf", width = 7, height = 5, units = "in", dpi = 300)
```

```r

# prior awareness

responses_filtered %>%
  select(awareness = `On a scale of 1 to 5, where one is 'Not at all aware' and
      five is 'Extremely aware', to what extent are you aware of the runway
      upgrades at Hobart Airport to accommodate larger aircraft such as the
      Boeing 777 or Airbus A330 and the projected 40% increase in flight arrivals
      ?\n`) %>%
  filter(!is.na(awareness)) %>%
  mutate(awareness = factor(awareness)) %>%
  group_by(awareness) %>%
  summarise(n = n()) %>%
  mutate(percentage = n / sum(n) * 100) %>%
  ggplot(aes(x = awareness, y = percentage)) +
  geom_col(fill = "grey90", colour = "black", lwd = 0.75) +
  theme_minimal() +
  ylab("Percentage") +
  xlab("") +
  guides(fill = FALSE) +
  geom_text(aes(label = sprintf("%.1f%%", percentage)), hjust = -0.5, size = 3) +
  scale_y_continuous(expand = expansion(mult = c(0,0.1))) +
  coord_flip()

ggsave("awareness.pdf", width = 7, height = 5, units = "in", dpi = 300)

# who do you contact

responses_filtered %>%
  select(12:18) %>%
  mutate(across(.cols = everything(), .fns = ~ ifelse(is.na(.), 0, 1))) %>%
  rename(Other = Other...18) %>%
  pivot_longer(1:7, names_to = "contact") %>%
  group_by(contact) %>%
  summarise(n = sum(value)) %>%
  mutate(percentage = n / sum(n) * 100) %>%
  ggplot(aes(x = reorder(contact, percentage), y = percentage)) +
  geom_col(fill = "grey90", colour = "black", lwd = 0.75) +
  theme_minimal() +
  ylab("Percentage") +
  xlab("") +
  guides(fill = FALSE) +
  geom_text(aes(label = sprintf("%.1f%%", percentage)), hjust = -0.5, size = 3) +
  scale_y_continuous(expand = expansion(mult = c(0,0.2))) +
  coord_flip()

ggsave("contact.pdf", width = 7, height = 5, units = "in", dpi = 300)

# multimodal contact

responses_filtered %>%
  select(1, 12:18) %>%
  mutate(across(.cols = 2:8, .fns = ~ ifelse(is.na(.), 0, 1))) %>%
  rename(Id = `#`, Other = Other...18) %>%
  pivot_longer(2:8, names_to = "contact") %>%
  group_by(Id) %>%
  summarise(modes = sum(value)) %>%
  ungroup() %>% #
  count(modes) %>%
  mutate(percentage = n / sum(n) * 100) %>%
  ggplot(aes(x = factor(modes), y = percentage)) +
  geom_col(fill = "grey90", colour = "black", lwd = 0.75) +
```

```
  theme_minimal() +
  ylab("Percentage") +
  xlab("Communication Channels") +
  geom_text(aes(label = sprintf("%.1f%%", percentage)), position = position_dodge
      (width=0.9), hjust = -0.5, size = 3) +
  scale_y_continuous(expand = expansion(mult = c(0,0.2))) +
  guides(fill = FALSE) +
  coord_flip()

ggsave("multimode.pdf", width = 7, height = 5, units = "in", dpi = 300)

# communication preferences

responses_filtered %>%
  select(30:34) %>%
  mutate(across(.cols = everything(), .fns = ~ ifelse(is.na(.), 0, 1))) %>%
  rename(Other = Other...34) %>%
  pivot_longer(1:5, names_to = "comms_pref") %>%
  group_by(comms_pref) %>%
  summarise(n = sum(value)) %>%
  mutate(percentage = n / sum(n) * 100) %>%
  ggplot(aes(x = reorder(comms_pref, percentage), y = percentage)) +
  geom_col(fill = "grey90", colour = "black", lwd = 0.75) +
  theme_minimal() +
  ylab("Percentage") +
  xlab("") +
  guides(fill = FALSE) +
  geom_text(aes(label = sprintf("%.1f%%", percentage)), hjust = -0.5, size = 3) +
  scale_y_continuous(expand = expansion(mult = c(0,0.2))) +
  coord_flip()

ggsave("comms_pref.pdf", width = 7, height = 5, units = "in", dpi = 300)

# mitigating actions

responses_filtered %>%
  select(20:28) %>%
  mutate(across(.cols = everything(), .fns = ~ ifelse(is.na(.), 0, 1))) %>%
  rename(Other = Other...28) %>%
  pivot_longer(1:9, names_to = "mitigation") %>%
  group_by(mitigation) %>%
  summarise(n = sum(value)) %>%
  mutate(percentage = n / sum(n) * 100) %>%
  ggplot(aes(x = reorder(mitigation, percentage), y = percentage)) +
  geom_col(fill = "grey90", colour = "black", lwd = 0.75) +
  theme_minimal() +
  ylab("Percentage") +
  xlab("") +
  guides(fill = FALSE) +
  geom_text(aes(label = sprintf("%.1f%%", percentage)), hjust = -0.5, size = 3) +
  scale_y_continuous(expand = expansion(mult = c(0,0.25))) +
  coord_flip()

ggsave("mitigation.pdf", width = 7, height = 5, units = "in", dpi = 300)

# multiple coping mechanisms

responses_filtered %>%
  select(1, 20:28) %>%
  mutate(across(.cols = 2:9, .fns = ~ ifelse(is.na(.), 0, 1))) %>%
  rename(Id = `#`, Other = Other...28) %>%
  pivot_longer(2:8, names_to = "mechanisms") %>%
```

```
  group_by(Id) %>%
  summarise(modes = sum(value)) %>%
  ungroup() %>% #
  count(modes) %>%
  mutate(percentage = n / sum(n) * 100) %>%
  ggplot(aes(x = factor(modes), y = percentage)) +
  geom_col(fill = "grey90", colour = "black", lwd = 0.75) +
  theme_minimal() +
  ylab("Percentage") +
  xlab("Coping Mechanisms") +
  geom_text(aes(label = sprintf("%.1f%%", percentage)), position = position_dodge
      (width=0.9), hjust = -0.5, size = 3) +
  scale_y_continuous(expand = expansion(mult = c(0,0.2))) +
  guides(fill = FALSE) +
  coord_flip()

ggsave("mechanisms.pdf", width = 7, height = 5, units = "in", dpi = 300)

# generative AI analysis

require(openai)

# impact of aircraft noise

impacts <- paste(responses_filtered$`Explain how the noise of aircraft passing
    over your property impacts your life, daily routine, lifestyle, and mental or
     physical health.`, collapse = "\n")

prompt_impacts = "Please examine the following text and summarise how the noise
    of aircraft passing properties impacts survey respondent's lives, daily
    routines, lifestyles, and their mental or physical health:"

response_impacts <- create_chat_completion(
  model = "gpt-4",
  temperature = 0,
  messages = list(
    list(
      "role" = "system",
      "content" = "You are a social scientist, assessing the impact of aircraft
          noise on residents below a flight path"),
    list(
      "role" = "user",
      "content" = paste(prompt_impacts, impacts)
    )
  )
)[["choices"]][["message.content"]]

# livelihood

livelihood <- paste(responses_filtered$`Does aircraft noise impact your
    livelihood/ability to work?`, collapse = "\n")

prompt_livelihood = "Please examine the following text and summarise how the
    noise of aircraft impacts survey respondent's ability to work:"

response_livelihood <- create_chat_completion(
  model = "gpt-4",
  temperature = 0,
  messages = list(
    list(
      "role" = "system",
```

```
      "content" = "You are a social scientist, assessing the impact of aircraft
          noise on residents below a flight path"),
    list(
      "role" = "user",
      "content" = paste(prompt_livelihood, livelihood)
    )
  )
)[["choices"]][["message.content"]]

# preferred outcomes

outcomes <- paste(responses_filtered$`If you could have it any way you wanted
    about aircraft noise, what outcomes or actions would you like to see
    happening?`, collapse = "\n")

prompt_outcomes = "Please examine the following text and summarise what outcomes
    or actions survey respondents want regarding aircraft noise:"

response_outcomes <- create_chat_completion(
  model = "gpt-4",
  temperature = 0,
  messages = list(
    list(
      "role" = "system",
      "content" = "You are a social scientist, assessing the impact of aircraft
          noise on residents below a flight path"),
    list(
      "role" = "user",
      "content" = paste(prompt_outcomes, outcomes)
    )
  )
)[["choices"]][["message.content"]]

# additional comments

comments <- paste(responses_filtered$`Any additional comments or questions?`,
    collapse = "\n")

prompt_comments = "Please examine the following text and summarise any closing
    comments made by respondents:"

response_comments <- create_chat_completion(
  model = "gpt-4",
  temperature = 0,
  messages = list(
    list(
      "role" = "system",
      "content" = "You are a social scientist, assessing the impact of aircraft
          noise on residents below a flight path"),
    list(
      "role" = "user",
      "content" = paste(prompt_comments, comments)
    )
  )
)[["choices"]][["message.content"]]

##################################################
#
#               End of script
```