Perth Airport

Perth Noise Abatement Procedures - Change to Preferred Runways

Environmental Analysis Summary

March 2016

Change Summary

Version	Date	Change Description	Amended by
1	6 August 2015	New document	Community Relations
2	21 September 2015	Correction of typographical error on page 9	Community Relations
3	22 March 2016	Correction of noise monitor data on page 9	Community Relations

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Introduction

The purpose of this document is to provide the results of the Environmental Analysis for a change to Preferred Runways at Perth Airport including expected environmental impacts and benefits of the change.

Perth Airport has two intersecting runways, the main runway 03/21 and the crossing shorter runway 06/24 (Figure 1).

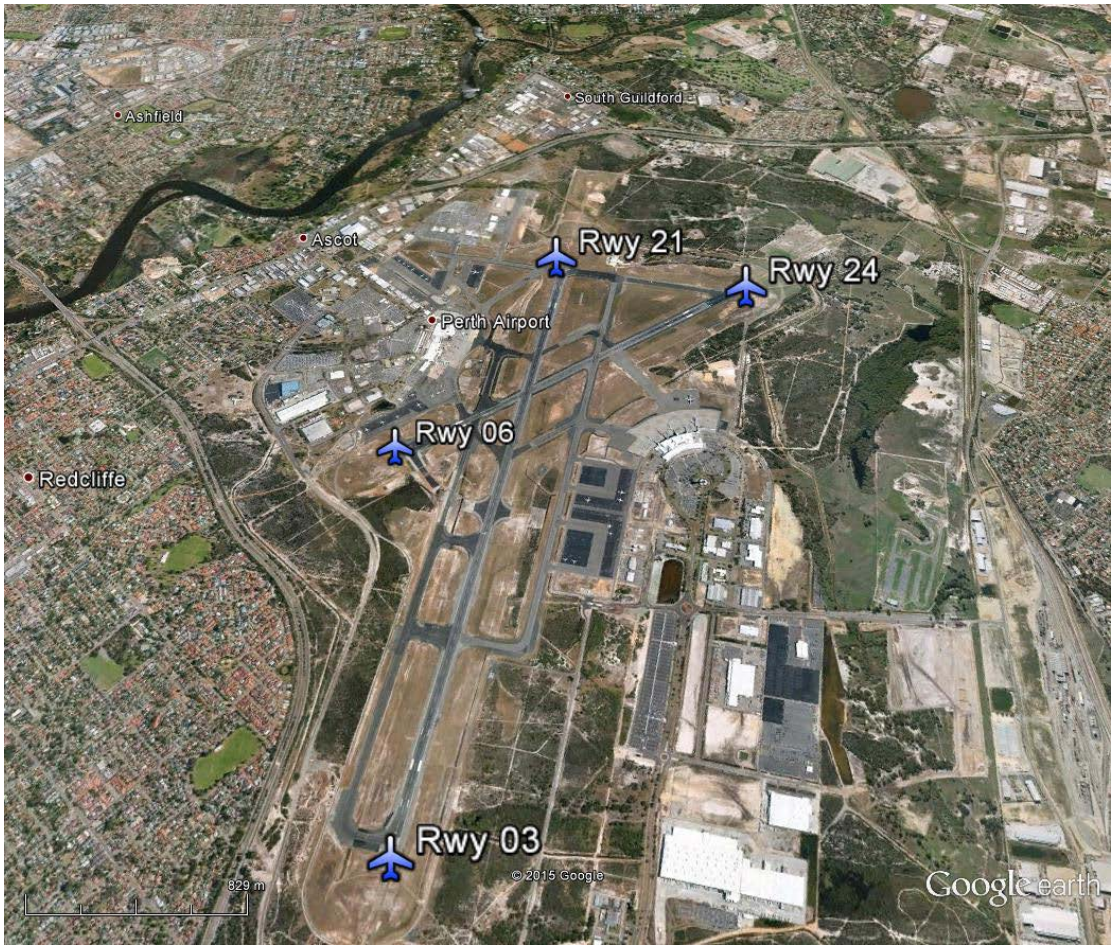


Figure 1: intersection runways at Perth Airport

Preferred Runways are selected by Air Traffic Control as part of the Noise Abatement Procedures (NAP) at Perth Airport. The nomination of runways is influenced by wind direction, noise abatement procedures and operational requirements. At Perth, operational requirements often preclude use of the existing Preferred Runways due to the restricted airspace around Perth, particularly to the north, and the locations of terminals on the airport and difficult access to some runways.

Airservices proposed the Preferred Runway configuration that would provide the best noise outcomes for the Perth community as part of the 2015 Perth Noise Improvement Plan. The proposed change to Preferred Runways in Perth is a result of that investigation and is considered by Airservices to be the best outcome taking into account actual use based on operational requirements and restrictions, whilst providing an overall noise improvement for the Perth community.

The proposed change is to provide equal preference in the Noise Abatement Procedures to nominate Runways 21, 24 and 03 for landing, and equal preference to nominate Runways 21, 03 and 06 for take off.

There will be a re distribution of numbers of flights as a result of the proposed change.

Assessment

Assumptions

The assessment was based on the following assumptions:

Air Traffic Control must determine runway nomination based on restrictions and other factors including:

- Taxiway efficiency and complexity, particularly during busy periods, increases the operational use of Runway 21;
- Pearce RAAF requirements to have additional spacing between aircraft off Runway 03 to the north;
- Alignment of runway selection of the two airfields at Perth and Pearce due to their close proximity;
- After the change, Runway 21 is expected to be used at times when there is downwind (wind with a northerly component), particularly during peak traffic periods;
- Twelve months of traffic from 2014 was used for the comparison of existing and proposed Preferred Runways.

There are no changes to flight paths as a result of the proposed change to Preferred Runways. Therefore this analysis does not include measurement of new noise events. It will focus on the changes to numbers of aircraft and difference in noise impact between departures and arrivals at a number of locations.

Runway Usage

When assessing the impacts of the change to Preferred Runways, data was collected for existing runway use based on 2014 calendar year data. The runway use was broken up into weekdays and weekends for night and day hours. Peak periods were defined to isolate as periods during which there would not be a change expected in runway use due to operational requirements.

The periods of activity at Pearce Airport was also determined as this also affects runway nomination. The majority of movements at Pearce occur from Monday to Thursday between 8 am and 12 midnight and Friday between 8 am and 3 pm. Pearce Airport Air Traffic Control generally operate from 8am to 5pm Monday to Thursday and from 8 am to 3 pm on Friday.

Data from the Perth NAP review in 2013/14 used 2012 data and identified the use of each runway for arrivals and departures. From that data, 62% of departures during the day period 6am to 11 pm used Runway 21 and 56% of departures during the night period 11 pm and 6 am used Runway 21. For arrivals, 89% of arrivals used Runway 24 and 21 (preferred) during the day period and 79% during the night period. The expected use was then calculated for each flight path associated with the different arrival and departure procedures in place at Perth. The resulting change in departures and arrivals distribution was used in combination with noise level data to calculate the overall impact.

How is noise measured?

Noise is measured using A-weighted decibels (dBA) which is a representative of the loudness of sounds in the air as perceived by the human ear.

To measure the maximum sound level of a single noise event, "LAmax" is calculated. This indicates the highest noise level a person on the ground would hear from a single aircraft overflight (arrival or departure).

The noise metrics used in this document provide information on the noise of individual over flights and the number of noise events for all areas situated under the proposed flight path. It is known that the potential impact of noise upon communities will vary dependent upon land use, with urban areas frequently reporting a higher acceptance of increased noise levels than rural areas due to higher ambient noise levels associated with transport, traffic and other activities.

Noise metrics

Airservices has noted that the following threshold values have been observed as reliable indicators of increased community awareness of aircraft noise changes in urban areas, and these have been applied in order to determine 'potential significance' as defined in Section 160 of the *Environment Protection and Biodiversity Conservation Act 1999* (Cth).

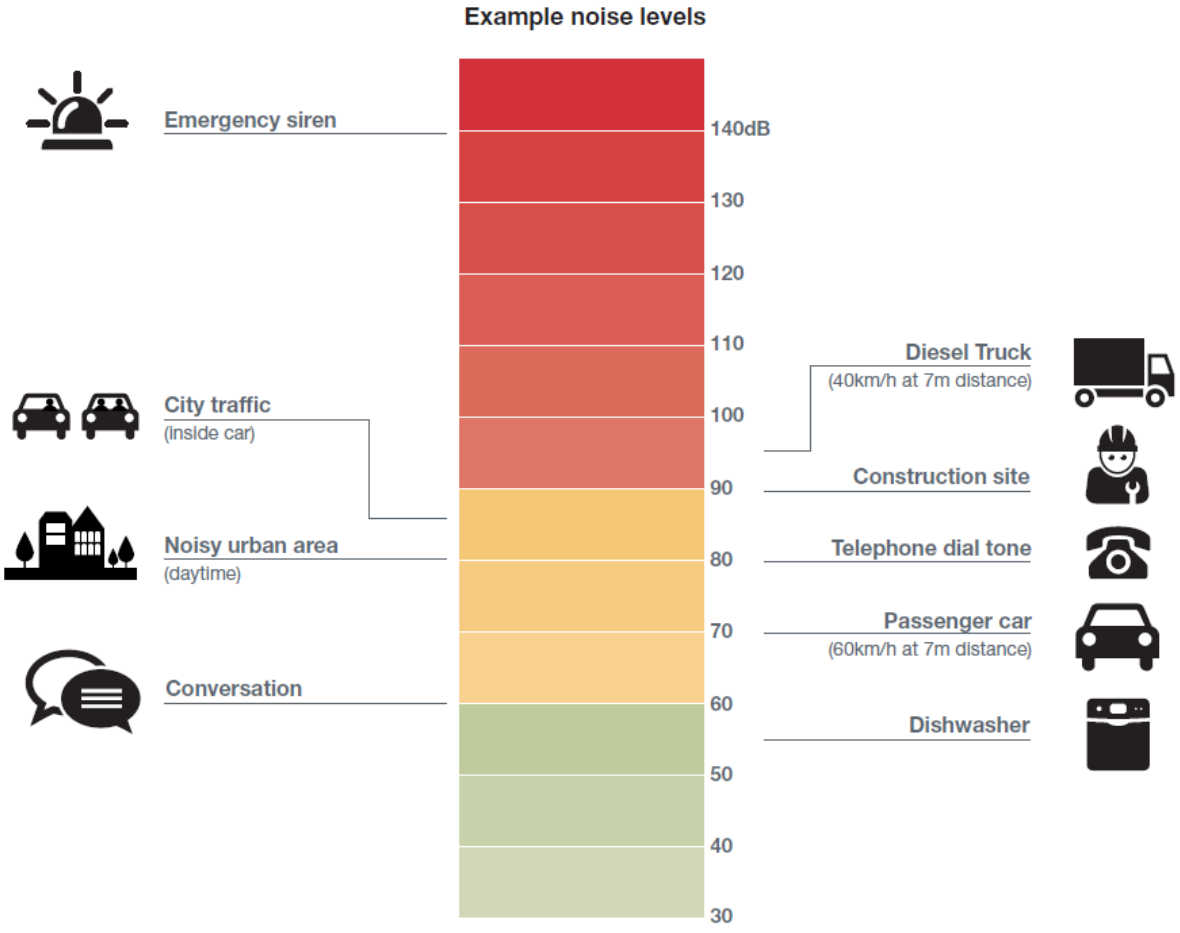
Noise metric – LAmax

The LAmax is the maximum noise level from a single noise event which may be modelled or measured. LAmax results are reported in dBA, rounded to the nearest whole decibel. LAmax is also reported graphically in 60 dBA and 70 dBA noise contours, representing the geographical area within which the maximum noise of a single over flight event is likely to be at or above these threshold levels.

The change in LAmax noise levels with reference to how people may perceive the sound is outlined below, noting that each individual may experience sound and perceive changes in noise levels differently:

- LAmax noise level changes of up to 3 dBA are not likely to be perceptible.
- LAmax noise level changes of between 3dBA and 5 dBA may be perceptible.
- LAmax noise level increases of between 5dBA and 10 dBA are likely to be perceptible.
- LAmax noise levels of greater than 10 dBA may be perceived as twice as loud.

Some comparisons of sound levels most people would experience on a regular basis are shown below. A noise level heard outside a house will generally be reduced by 10 dBA inside the house due to the attenuation of walls and building fabric as noticed in Australian Standard 2021-2000.



Above are some comparisons of sound levels most of us would experience on a regular basis.

Analysis

Noise Levels

Aircraft types:

The Airbus A330 and Boeing B738 aircraft were found to be louder on departure than on arrival at the Queens Park noise monitor and for all other aircraft types the noise levels appeared to be equal. At the Greenmount noise monitor the A320, B763, B772, B738 and B733 aircraft were all louder on arrival than on departure. For other aircraft types the noise levels appeared to be equal. All aircraft types at the Guildford noise monitor were louder on departure. At Cannington all aircraft types were louder on departure.

Runway Selection:

Runway 03 Arrivals and Runway 21 Departures

Cannington departures were louder than arrivals of up to 5.4 dBA and residents at Cannington would be overflown by more arrivals and less departures as a result of the change. A reduction in noise is expected to be perceptible.

Runway 03 Departures and Runway 21 Arrivals

Noise levels for departures in northern areas including Guildford are louder than arrivals but the low number of expected changes in departures relative to arrivals is such that residents are unlikely to notice a change in overall noise impact.

Runway 06 Departures and Runway 24 Arrivals

Areas affected by Runway 06 departures and Runway 24 arrivals including Greenmount are expected to be overflown by more departures and less arrivals. Noise levels are generally louder for arrivals in this area but the difference of up to 3.6 dBA is unlikely to be noticeable.

Findings

Data analysis has shown that the net change (difference between arrivals and departures) in traffic movements over the areas required to be assessed, as impacted by the change in Preferred Runways, ranges from a reduction of three movements per day to a maximum increase of two movements per day on average. As such, the proposed Perth Airport change to Preferred Runway use is not likely to result in any significant environmental impact within the meaning of the *Environment Protection and Biodiversity Act*, *1999 (Cth).*

In determining the proposed preferred runways, Airservices sought to provide the best noise outcome for the entire Perth community.

The existing preferred runways were established many years ago and Runway 21 is generally used both for operational reasons and as preferred for departures. This increases the over flight of southern residents in busy periods and at night and at the weekend.

The current procedures specify that Runway 21 (arriving over Guildford) and Runway 24 (arriving over Greenmount) are equally preferred for arrivals and Runway 21 (departing over Queens Park) is the only runway preferred for departures. Arrivals to Runway 06 (over Redcliffe) and departures from Runway 24 (over Redcliffe) are least-preferred due to the close proximity of residential areas at the southern end of the cross runway.

In 2014, on 44 nights, there were no departure flights to the west and north from Runway 21 with 10 flights occurring on a busy night (90th percentile).

Expected effects of this change

(note numbers are average estimates only)

The Preferred Runway change is estimated to reduce the number of nights Runway 21 is used for departures by an average of 25%. For arrivals, equal preference would be given to Runway 21 (over Guildford), Runway 24 (over Greenmount) and Runway 03 (over Queens Park). For departures, equal preference would be given to Runway 21 (over Queens Park), Runway 03 (over Guildford) and Runway 06 (over Greenmount). Arrivals to Runway 06 and departures from Runway 24 (over Redcliffe) would be maintained as being least-preferred.

If the reduction in the number of nights is achieved as expected, this will result in 124 nights a year with no departures from Runway 21, with an average of nine flights from that runway to the west and north (over the Swan River area) on a busy night.

By less use of Runway 21 at night and weekends Airservices will make greater use of the less populated airspace to the north west of Perth reducing the number of population over flown during these periods.

Additionally:

- There would be no change to runway use on weekdays from 5 am to 9 pm.
- On average, there may be 40 fewer flights a year aircraft would depart from Runway 21 (over Queens Park) at night.
- Runway 03 arrivals and Runway 21 departures (Queens Park runway end):
    - during the day on the weekend – there may be 12 more arrivals and 15 fewer departures each day
    - on all nights – there may be three more arrivals and three fewer departures each night
    - Queens Park is expected to experience no perceptible difference in noise level between arrivals and departures, however there is likely to be a noticeable reduction in noise level in Cannington.
- Runway 03 departures and Runway 21 arrivals (Guilford runway end):
    - during the day on the weekend – there may be 11 more departures and nine fewer arrivals a day
    - on all nights – there may be two more departures and three fewer arrivals a day
    - departures recorded at the Guildford noise monitor are louder than arrivals by, on average, between 4.4 and 5.4 decibels (dBA), which is likely to be noticeable.
- Runway 06 departures and Runway 24 arrivals (Greenmount runway end):
    - during the day on the weekend – there may be five more departures and three fewer arrivals a day
    - on all nights – there may be one more departures and one fewer arrival a day
    - no perceptible difference in noise level between arrivals and departures is expected.

Whilst the areas to the southwest of Perth will benefit most from this change, the combined use of the proposed Smart Tracking arrival flight path and the Preferred Runway change will provide noise respite to those residents living directly to the south of the airport. The number of departures and arrivals in areas including Canning Vale will reduce as a result of these changes introduced as part of the Perth Noise Improvement Plan. A Post Implementation Review of both changes will be conducted in September 2016 to ensure that seasonal variation is taken into account to review the anticipated benefits of these changes.

The proposed Preferred Runways change will be influenced by Air Traffic Control nomination of runways based on operational requirements due to military airspace restrictions and the limitations of airport taxiway and runway access from terminals. Runway 21 is expected to be used at times when there is downwind, particularly during peak departure periods. Air traffic control regulations allow a dry runway to be nominated with up to 5 kts of downwind.

There will be occasions when the runway is selected initially as the in-to-wind runway and when the wind changes, for example, it will be too busy for a runway change and the runway continues to be used with downwind until the traffic reduces and it is safe to change the traffic flow.

Noise Abatement Procedures

Perth Airport's Noise Abatement Procedures – the procedures that nominate which runways and flight paths are preferred for arriving and departing aircraft and used by pilots and air traffic control to minimise the impact of aircraft noise on residential areas – were recently reviewed by Airservices (available at www.airservicesaustralia.com/publications/noise-reports/noise-abatement-procedures-reviews).

Airservices found that the current wording of runway procedures did not consistently match the operational requirement of managing the flow of aircraft to and from the airport (in the air and on the ground).

The proposed change provides the community with clarity while retaining the flexibility that pilots and air traffic control need to manage operations as safely and efficiently as possible. It also provides a noise improvement opportunity for the community that is most affected by the current runway preference system, to the southwest of the airport.

Conclusion

Airservices proposed the Preferred Runway configuration that would provide the best noise outcomes for how runways are assigned for the Perth community as part of the 2015 Perth Noise Improvement Plan. The proposed change to Preferred Runways in Perth is a result of that investigation and is considered by Airservices to be the best outcome taking into account actual use based on operational requirements and restrictions, whilst providing an overall noise improvement for the Perth community.

It is not likely that the proposed change has the potential to cause a significant environmental impact within the meaning of the *Environmental Protection and Biodiversity Conservation Act (1999)* Cth.

The preferred runway change is estimated to reduce the number of nights Runway 21 is used for departures by an average of 25% and, if the reduction in the number of nights is achieved as expected, this will result in 124 nights a year with no departures from Runway 21 with an average of nine flights from that runway to the west and north (over the Swan River) on a busy night.

Whilst the areas to the southwest of Perth will benefit most from this proposed change, the combined use of the proposed Smart Tracking arrival flight path and the Preferred Runway change will provide noise respite to those residents living directly to the south of the airport. The number of departures and arrivals in areas including Canning Vale will reduce as a result of these changes introduced as part of the Perth Noise Improvement Plan.

As per standard process, Airservices will formally review this change in September 2016 to analyse the results to date and to ensure that the changes has met the intent.