

# **RTIA Runway Utilization Discussion Paper**

**December 2003**

## **1.0 Introduction**

The Airport Noise Advisory Panel (ANAP) is a voluntary committee formed by the Airport Authority of Washoe County (AAWC) Board of Trustees. The ANAP has been in existence for over twenty years and its function has been and continues to be to gather data pertaining to aircraft noise, consider how these noise levels may impact surrounding development, and evaluate and recommend possible solutions for impacts to incompatible development. The committee composition is made up of citizen representatives from each of the three local jurisdictions (Cities of Reno and Sparks and Washoe County) as well as planning representatives from each of the jurisdictions and industry representatives (airlines, Air National Guard, air cargo, and general aviation).

At the 2<sup>nd</sup> Quarter ANAP meeting, held on May 21, 2003, a lengthy discussion regarding past and present runway utilization at the Reno/Tahoe International Airport (RTIA) ensued. Since this particular topic has been the focus of discussion many times previously, it was decided that AAWC staff, as liaison to the ANAP committee, should prepare a discussion paper attempting to document all of the issues associated with runway utilization at RTIA in order to facilitate a better understanding of the subject and possibly help the ANAP reach consensus on a direction for proceeding forward.

As a result, the following provides information on the responsibilities of the various organizations involved with the operation of aircraft, history of runway utilization at the airport, the results of various studies that analyzed the impacts of changes to runway utilization and the process required to analyze/affect a change in runway utilization at RTIA.

## **2.0 Enabling Legislation and Responsibilities of Various Organizations**

To fully understand how airports operate and how aircraft are controlled, one must first understand that no single entity is in charge of all matters related to aircraft/airport operations. The three primary organizations that control aircraft/airport operations are the Federal Aviation Administration (FAA), the Airport Authority of Washoe County (AAWC), and the airlines/pilots in command.

### **2.1 Federal Aviation Administration**

The Federal Aviation Act of 1958 established the FAA as the responsible agency for the control and use of navigable airspace within the United States. Since aviation is vital to interstate commerce, the federal government has assumed the role of coordinator and regulator of the nation's aviation system. The Federal Government, through the FAA,

has the authority and responsibility to control aircraft movements on the ground and in the air.

Given the large volume of aircraft operations occurring today, the FAA's first priority is the safe and efficient movement of that traffic. However, recognizing that aircraft noise impacts on communities surrounding airports has grown to be the most important environmental concern across the nation, the FAA will implement operational noise abatement procedures to reduce impacts. These procedures have included preferential runway use programs, modified arrival and departure tracks, adjusted arrival and departure climb rates, as well as changes to minimum vector and traffic pattern altitudes. Although the FAA is the agency responsible for implementing noise abatement procedures of this nature, they are generally not the sponsor or lead advocate for such changes. The FAA will attempt to work with an airport and/or community to implement a new procedure that reduces noise impacts yet satisfies safety requirements.

The FAA is also responsible for the regulation of noise source emissions through its aircraft type certification program. The FAA sets maximum noise standards that aircraft manufacturers must meet in order to be certified for production. With the passage of the Airport Noise and Capacity Act (ANCA) of 1990, aircraft unable to meet "Stage 3" noise standards were no longer allowed to operate after the year 1999. The FAA is currently working with the International Civil Aviation Organization (ICAO) to establish new standards for Stage 4 requirements. Unfortunately, the Stage 4 standard being considered is only 10 dba below that of today's Stage 3 level, and all aircraft manufactured today already exceed the new standard. However, the Stage 4 standard will require the eventual phase out of older, hush kitted and marginal Stage 3 aircraft.

Finally, the FAA is responsible for the Airport Improvement Program (AIP), which collects aviation user fees and provides grant funds to airports for various safety, security, capacity, and noise projects. Approximately ten percent of the \$3.4 billion AIP grant funds distributed annually are specifically earmarked for noise mitigation projects at airports that have completed a Federal Aviation Regulations (FAR) Part 150 Noise Compatibility study. To date, the AAWC has received in excess of \$30 million in grants for the sound insulation and land acquisition programs.

## **2.2 Airport Authority of Washoe County**

The AAWC, as the proprietor of the Reno/Tahoe International Airport (RTIA), has no legal authority to control/restrict aircraft movements nor does it have legal responsibility to mitigate the impacts of aircraft noise. For all intents and purposes, the AAWC is the landlord responsible for the provision and maintenance of facilities needed to support the aviation demand that serves this community. The one legal obligation for which the AAWC is responsible for is keeping these facilities available for public use as part of the assurances agreed to in accepting federal grants.

Having said that, the AAWC recognizes its "good neighbor" responsibilities of providing the facilities the community needs but limiting their impact to the maximum extent

possible. As will be discussed later in this paper, the AAWC has voluntarily sponsored noise mitigation studies since the late 1970s. Based on the recommendations of these studies, the AAWC has worked with the FAA to implement a number of operational changes. In addition, the AAWC has sponsored sound insulation and land acquisition programs for the last 10 years in order to mitigate noise impacts.

Finally, it must be recognized that the AAWC does not have any land use jurisdictional control. Encroachment of incompatible development adjacent to the airport is a constant threat and therefore, the AAWC works closely with the Cities of Reno and Sparks and Washoe County to limit these issues.

### **2.3 Airlines/Pilots in Command**

Similar to the FAA, the airlines and aircraft operators' first priority is to conduct flights safely and efficiently. In terms of noise abatement, airlines have no legal responsibilities for the creation of new procedures however; their input to the process is vital for its successful implementation. Airlines often resist noise abatement procedures because, in most cases, it will cost them money in added flight time and/or fuel. Once the procedure is demonstrated to be safe and beneficial in reducing noise, the airlines have a great track record of participation, even with voluntary procedures.

Pilots in command of a flight can request a deviation from a procedure such as a preferential runway use program and the FAA air traffic control staff often try to accommodate these requests. However, their occurrence is rare. Finally, pilots in command can deviate from any procedure or air traffic controller direction at any time in cases of emergency.

### **3.0 Historical Runway Utilization**

In explaining the runway utilization at RTIA, it is important to look at the runway configuration, as it was and as it is today, previous studies, and historical trends. Presently, there are three runways at RTIA. Since the wind conditions typically experienced in the Truckee Meadows are generally northerly and southerly, and since aircraft will normally land and take off into the wind, there are two, main parallel runways generally aligned in a north-south orientation. These are designated as Runways 16L-34R and 16R-34L with lengths of 9,000 and 11,000 feet, respectively. In addition, there is Runway 7/25 with a length of 6,100 feet, which is generally aligned in an east-west orientation. When the airport operates in a north flow pattern, arriving and departing traffic use Runways 34L and 34R. When a south flow pattern is used, arriving and departing traffic use Runways 16R and 16L. A south flow preferential runway use program has been in place at RTIA for 30 years. As a result, the primary runway for air carrier and military aircraft departures at RTIA, during periods when calm and southerly wind conditions exist, is currently Runway 16R. Since Runway 7/25 has mountainous terrain at either end, in addition to a limited runway length, it is typically only used in high crosswind conditions by smaller aircraft in the commuter and general aviation (GA) fleet.

### **3.1 Reno International Airport Noise Control and Land Use Compatibility Study**

One of the first major studies prepared specifically to address noise at RTIA was prepared in July of 1979. It was called the Reno International Airport Noise Control and Land Use Compatibility Study. In this study, it was stated, “the predominant direction of aircraft operations at RNO is southerly, with approximately 75% of all arrivals and departures occurring toward the south. This means that the majority of jet aircraft on departure overfly an area which, while mostly undeveloped, contains clusters of low and medium-density residential communities; the majority of jet aircraft on arrival overfly well-established medium-density residential and industrially-developed portions of Sparks”. One of the studies’ operational/management elements of the recommended plan was a preferential runway use program, identifying Runway 16 as the preferred runway, where the flow of traffic would be predominantly north to south. The study indicated that departures to the south would minimize high noise exposure to the greatest residential concentrations. It was estimated that 75% of the air carrier and military operations could be conducted on Runway 16. “The designation of Runway 16 as the preferential runway will effectively minimize the overall noise impact of RNO. The remaining 25% of the air carrier and military operations are assigned to Runway 34, with the predominant flow south to north”. The recommendation of this 1979 study was that the Airport Authority of Washoe County should “request the FAA Air Traffic Control Tower to minimize northerly takeoffs and nighttime arrivals from the north”.

### **3.2 Reno Cannon International Airport FAR Part 150 Noise Compatibility Study**

The next study initiated by the AAWC was the 1991 Reno Cannon International Airport Federal Aviation Regulations (FAR) Part 150 Noise Compatibility Study. This report recommended that the pattern of land use around the airport provide the guidance to the design of arrival and departure routes and runway use programs for noise abatement. It indicated that by directing aircraft over more compatibly used areas, noise impacts might often be significantly reduced. However, this same study goes on to state that, “there remains virtually no vacant land, or undeveloped corridors around the Reno Airport which could be used to funnel air traffic away from residential areas. No matter where aircraft are routed, some residential developments will be affected. Therefore, the goal ...must be to minimize the number of people impacted by routing air traffic over the least populated areas”. At the time of this particular study, the base year for noise contours was 1989 and runway use for air carrier aircraft at RTIA (based on Table 3J) was shown as a 65/31/4 distribution. Therefore, 65% of departures flowed south, 31% of departures flowed north, and 4% of aircraft utilized the east/west Runway 7/25.

This study evaluated alternatives that increased the number of departures to the north. However, the final recommendation was that the existing distribution (65/31/4) be maintained.

### **3.3 Environmental Assessment of Proposed Runway Extension of 16R/34L**

In 1993, an Environmental Assessment (EA) of the proposed runway extension was done. This proposed extension was an effort to reduce the effects on air carrier aircraft performance caused by Reno Cannon's elevation, high summer temperatures, and high surrounding terrain. These constraints limited the maximum allowable take off weight of certain aircraft. This in turn reduced the amount of fuel, cargo, and/or passengers that could be carried to less than what would otherwise be permitted on a longer runway. It was determined that the proposed extension would enable aircraft departing to the south to begin their take off further from the residences south of the Airport (approximately 1,000 feet further to the north). Therefore, aircraft would be 50 to 120 feet higher during climb-out. Single-event noise levels were projected to be 0.5 to 3.0 decibels lower at ground level approximately 20,000 feet from the brake-release point (the approximate center of the Huffaker subdivision). This difference was projected to be perceptible to those on the ground.

It was also calculated and acknowledged that this particular runway extension would shift a small percentage of additional air carrier departures (assumed to be less than 1%) from Runway 34L to Runway 16R. At the time of this study's preparation, 1992, the existing runway utilization split was 62 % south and 38 % north for air carrier aircraft. This prediction was based on the assumption that some of the existing contra-flow operations (aircraft that took off to the north when most other take offs and landings were being conducted to the south) would be eliminated with the runway extension. It was also estimated that the changes in the noise contour due to this shift would be a "very slight increase to the southern contours, matched by a very slight decrease to the northern contours". When projections to 2010 for the noise contour were made, there wasn't anticipated to be a meaningful difference with or without the runway extension project. It is important to note that despite the fact that the predicted change in runway utilization in this Environmental Assessment may have been underestimated, all rules, procedures, and laws in regard to analysis methodology and public comment were followed in its compilation.

### **3.4 Annual Noise Contours**

Over the past twenty years, annual contours have helped RTIA to track trends in the departure and arrival of aircraft. These yearly contours have also assumed runway use (percentages of north/south direction splits). These percentages were determined using a combination of Air Route Traffic Services (ARTS) IIE radar data, when available, and historical runway use factors at RTIA. From 1982 to 2002, when the most recent contour was completed, the runway-split percentages have varied. In 1982, air carrier aircraft departed to the south 71% of the time, while northerly departures occurred only 24% of the time. (The remaining departure activity occurred on Runway 7/25.) In 2002, the percentage of departures to the south was determined to be 85%, while those to the north were determined to be 15%. (For many of the years between 1982 and 2002, it was determined that no air carrier activity occurred on Runway 7/25.) In evaluating the past

twenty years of annual contours, the smallest percentage of southerly departures (62%) occurred in 1992 and 1993. Over the past twenty years, departures to the south have increased by 14%. Over time improvement in aircraft performance, runway extension, and type of aircraft have allowed more aircraft to depart to the south with the wind. (Please see attached historical contour information.)

#### **4.0 FAR Part 150 Update**

RTIA's Update to the 1991 FAR Part 150 Noise Compatibility Study was completed in March 2002. Since the initial FAR Part 150 Study, there had been the completion of the approved 1,000-foot extension to Runway 16R-34L. This updated study shows that Runway 16R/16L continues to be the preferential runway for up to a 5-knot tailwind. In fact, after analyzing FAA flight data strips from year 1999, it was determined that the annual-average runway split had changed to an approximate 82% south flow and an 18% north flow.

#### **4.1 Analysis of Alternative Runway Utilization**

Acknowledging the change in the runway split and the increase in southerly departures, the FAR Part 150 Update sought to "test the effectiveness of implementing a rotational runway use program with 60% of aircraft departures operating to the south and 40% operating to the north". A noise model run was created reflecting a 60/40 rotational runway use program and utilizing the 2005 baseline input. The population impacts for this alternative were shown to be a net gain of 1,740 people. Therefore, the conclusion to this study was that a 60/40 rotational runway use program would place a "large number of additional individuals within the aircraft noise contours when compared to the existing runway use policy. Although this alternative reduces the number of people impacted by noise south of the airport, this is done at the expense of exposing a large number of additional individuals to aircraft noise above 65 DNL north of the airport".

As mentioned in the following section, it is the policy of the FAA not to approve alternatives that either shift noise from one group to another or impact additional individuals. Since, this particular study was shown to have both effects, it was determined that "continued use of the airport's current runway use scenario appears to be a better alternative".

#### **4.2 Part 150 Goals**

The Airport Noise Compatibility Planning Program (14 CFR Part 150) was established under the Aviation Safety and Noise Abatement Act of 1979 (ASNA). This voluntary program sets forth the measures that an airport operator has taken or has proposed for the reduction of existing noncompatible land uses and the prevention of the introduction of additional noncompatible land uses within the area covered by noise exposure maps. In addition, the FAA conducts an evaluation of each noise compatibility program. "A primary criterion in the ASNA for the FAA's approval of measures in an airport's part 150 noise compatibility program is that the measures must be reasonably consistent with

obtaining the goal of reducing existing noncompatible land uses (around the airport) and preventing the introduction of additional noncompatible land uses”.

## **5.0 Conclusions**

In closing, it is, once again, important to reiterate that the “FAA is responsible for the control of navigable airspace and the operation of air traffic control systems at the nation’s airports”. Airport proprietors have no direct control over airspace management and air traffic control, although they can propose changes in procedures. The FAA reviews any proposed changes in flight procedures, such as flight tracks or runway use programs, proposed for noise abatement on the basis of safety of flight operations, safe and efficient use of the navigable airspace, management and control of the national airspace and air traffic control systems, effect on security and national defense, and compliance with applicable laws and regulations. Typically, FAA implements and regulates flight procedures pertaining to noise abatement through the local air traffic control manager”.

In addition, implementation of noise abatement measures are subject to additional operational, feasibility, and environmental review by the FAA. Implementation of the 60/40 rotational runway use program at this juncture would necessitate such a review, since this alternative exposes residential areas to new and/or increased levels of aircraft noise. “Based on the results of the preliminary environmental review, the FAA will determine the level of environmental analysis needed pursuant to the National Environmental Policy Act of 1969 and its implementing regulations”.

In numerous locations within the FAR Part 150 regulation, the stated goal of the program is to reduce the persons impacted by aircraft noise. According to FAR Part 150, the purpose of a noise compatibility program is to develop a program that “reduces existing noncompatible uses and prevents or reduces the probability of the establishment of additional noncompatible uses”. The FAR Part 150 Update study previously evaluated the possibility of modifying the runway utilization split and determined that a greater number of persons would be impacted. Therefore, a change was not recommended.

Lastly, at the March 21, 2002 Airport Noise Advisory Panel meeting during a discussion of the FAR Part 150 Update, a motion was made and seconded to propose a feasibility study re-evaluating the 60/40 split alternative be done. However, the motion was voted down by a majority of the panel.

\* NOTE: The above is a copy of the “RTIA Runway Utilization” discussion paper, submitted to the Airport Noise Advisory Panel. The Airport Authority of Washoe County expresses no opinion with respect to these documents and merely provides them as a service to the public.

## **Bibliography**

1. Reno International Airport Noise Control and Land Use Compatibility Study (1979)
2. RCIA – FAR Part 150 Noise Compatibility Study (July 1990)
3. RTIA - FAR Part 150 Noise Compatibility Study, Update (March 2002)
4. [www.awp.faa.gov/atenviro/AVIATION.htm](http://www.awp.faa.gov/atenviro/AVIATION.htm)
5. FAA Airport Noise Compatibility Planning Toolkit (April 2000)
6. Environmental Assessment of Proposed 1,000 foot extension of Runway 16R-34L (1993)
7. Revision to Noise Compatibility Program for Reno Cannon International Airport (1993)
8. 14 CFR Part 150 Rules and Regulations from the Federal Register Online via GPO Access [[wais.access.gpo.gov](http://wais.access.gpo.gov)]
9. [www.airportnet.org/depts/regulatory/farparts/part150far.html](http://www.airportnet.org/depts/regulatory/farparts/part150far.html)



## Historical Runway Split for the Reno/Tahoe International Airport:

<u>YR.</u>	<u>SO. DEPARTURES</u>	<u>NO. DEPARTURES</u>	<u>RWY 07/25</u>
1982	71%	24%	5%
1983	70%	26%	4%
1984	Unknown		
1985	70%	30%	
1986	Unknown		
1987	70%	27%	3%
1988	70%	27%	
1989	65%	31%	4%
1990	66%	32%	2%
1991	76%	24%	
1992	62%	38%	
1993	62%	38%	
1994	72%	28%	
1995	86%	14%	
1996	85%	15%	
1997	78%	22%	
1998	82%	18%	
1999	82%	18%	
2000	82%	18%	
2001	85%	15%	
2002	85%	15%	

Note: The above percentages apply to air carrier (passenger and cargo) aircraft and do not include military or general aviation activity.