

# 2011

# **Noise Mitigation Monitoring Summary**

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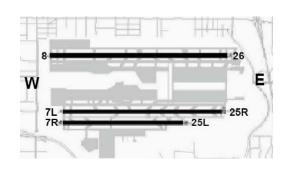




Report prepared for TAVCO by the City of Tempe 255 East Marigold Lane Tempe, AZ 85281

## 1. Introduction

This summary is assembled for the Tempe Aviation Commission (TAVCO) to summarize annual compliance of airline operations at Phoenix Sky Harbor International Airport with noise mitigation flight procedures over the City of Tempe. TAVCO consists of 11 Tempe residents appointed by the Tempe Mayor with approval of the Tempe City Council to assist and advice on aviation noise and other impacts relating to agreements made between the City of Phoenix and the City of Tempe concerning the operations of Sky Harbor International Airport and assist in studies conducted of local airports and their development with regard to potential



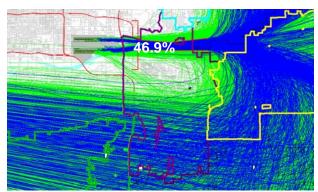
impacts on Tempe residents. The City of Tempe is located directly east of the Phoenix Sky Harbor International Airport. The airport is owned and operated by the City of Phoenix and expanded in October 2000 with a third parallel runway (7R/25L). After the FAA in 2002 suspended the implementation of a side step visual approach procedure to the new runway agreed upon between the two cities, the following two flight procedures remain in place to mitigate noise impact from large aircraft over Tempe:

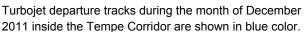
- The 4-DME Standard Instrument Departure Procedure to keep jet and large turboprop aircraft that depart to the east over the Salt River/Tempe Town Lake area before they make turns towards their route destinations.
- Annual equalization of all turbojet and large turboprop aircraft departing east and west of the airport during daytime and nighttime hours.

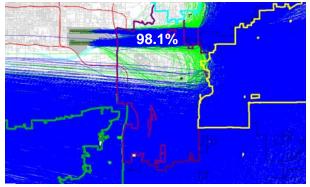
# 2. 4-DME Compliance

#### Compliance Rates

After the cities of Tempe and Phoenix entered into an intergovernmental agreement dated September 2, 1994 on noise mitigation flight procedures, a measure was developed to track how large aircraft complied with the 4-DME instrument departure procedure to the east. The City of Phoenix implemented a gate the large aircraft had to pass through to avoid violating the procedure. This is an imaginary vertical line at 4-DME used as a filter in the Noise and Flight Track Monitoring System (NFTMS) for the Phoenix Sky Harbor International Airport. TAVCO developed a "Corridor", which was based on Standard Instrument Departure procedures that were in use when the intergovernmental agreement with the City of Phoenix was made.



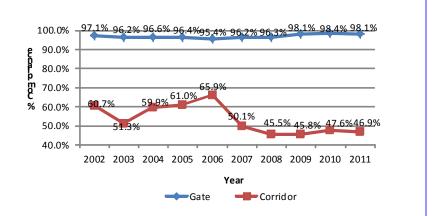




Turbojet departure tracks over the same period inside the Phoenix Gate depicted in blue.

Large turboprop aircraft are not included in the depictions. These aircraft are routinely routed outside the 4-DME gate on approximate departure angles of 120° towards the southeast and 60° towards the northeast.

The annual average compliance rates are based on monthly numbers from the TAVCO Noise Mitigation Monitoring Reports. The November and December 2005 reports did not include exclusions of aircraft deviations because of weather as was done for previous months and years due to missing data provided by the City of Phoenix Aviation Department. In 2006 cross winds of 10 knots or more was used to filter out deviations due to weather. In 2007 the department resumed registering hours with weather conditions assumed to negatively have impacted large commercial jets' climb trajectory over Tempe.

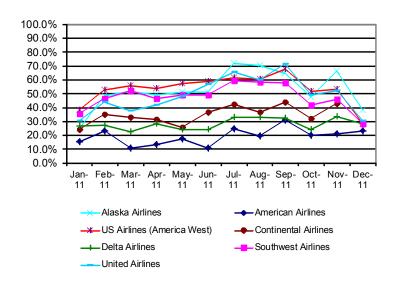


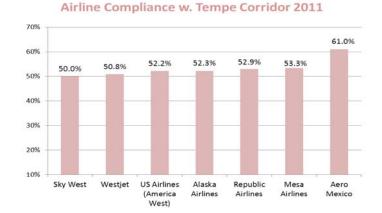
Compared to 2010 daytime turbojet and large turboprop departures towards the east decreased 8.2%, and night-time departures increased 26.5%. Overall departures and arrival operations by these aircraft east of the airport increased 11.9% compared to 2010.

# Large Carrier Compliance

The graph shows corridor compliance rates for some of the airport's busiest airlines. Continental Airlines did not have any departures towards the east in December, where the holiday traffic volumes and weather impacted compliance rates.

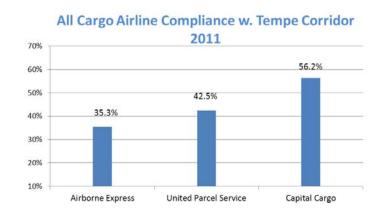
Among the larger carriers, Aero Mexico had on average best compliance with the Tempe Corridor during 2011. In 2009, the airline reached 66.5% compliance with the Tempe Corridor. Only airlines with on average ≥ 10 departures to the east per month are included.





#### Top All Cargo Carriers

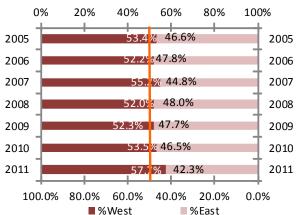
Among the larger, all cargo carriers Capital Cargo had on average best compliance with the Tempe Corridor during 2011, which makes it the best performing airline in this category four years in a row. The top three cargo airlines have failed to reached 50% or higher corridor compliance since 2008.



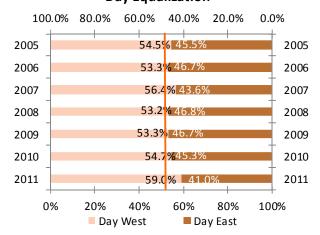
# 3. East/West Departure Split

The annual split in all turbojet and large turboprop aircraft departures to the east and west of the Phoenix Sky Harbor International Airport differs between dayand day nighttime hours. The most of these operations goes towards the west when both day- and nighttime hours are combined. Departure traffic during the night and early hours of the day is predominantly going towards the east.

# Annual Equalization (Day&Night)

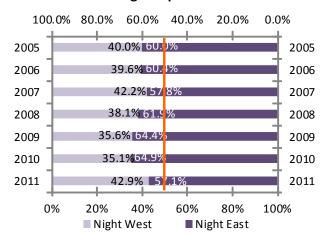


### Day Equalization



Day = 7: 00 a.m. to 9:59:59 p.m. local time

#### **Nigth Equalization**



Night = 9:59:59 p.m. to 7:00 a.m.

# 4. Complaints

The City of Tempe started registering aircraft noise complaints from Tempe residents in October 2000 after the opening of the third runway at Phoenix Sky Harbor International Airport. Most of the complaints on airline traffic have traditionally come from residents livina in north Tempe neighborhoods where aircraft are at lower altitudes. In January of 2011 received a series of complaints from a resident located just south of the Salt River, which is shown in a graph that separate complaints north of the Salt riverbed and the Loop 202 freeway from complaints received from resident living south of the riverbed inside the same 85281 zip code. The resident reacted to the relentless frequency of airline operations.

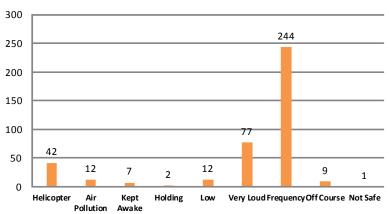
The flow of arrival operations had become more effective due to new RNAV/RNP approach procedures that the airlines were using, reducing the difference in how often aircraft flew over downtown areas of Tempe during peak hours. Aircraft typically depart with high frequency in the morning hours and arrive with more separation between the aircraft during afternoon hours.

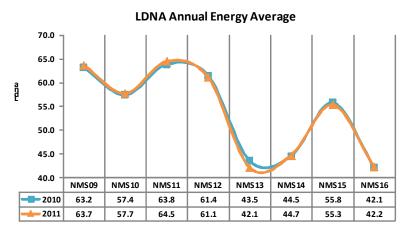
# 5. Averaged Noise Levels

Annual (Day-Night) average sound level, Ldn (A), registered by Sky Harbor NFTMS monitors located in Tempe increased somewhat at monitoring sites in Tempe during 2011, except for three monitors located north of the riverbed.

#### 2011 Complaints by Area 400 337 350 300 250 200 150 100 37 50 0 n 85281 85281 85282 85283 85284

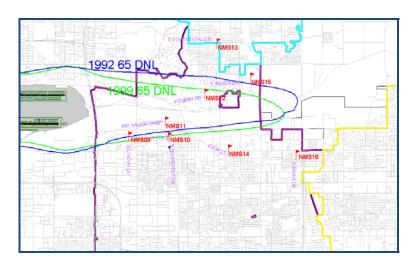
**2011 Complaints by Disturbance** 



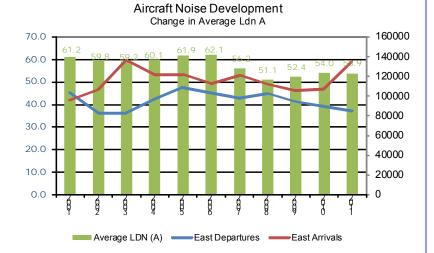


**Noise Monitoring Sites** 

Eight noise monitoring sites are located in Tempe north and south of the Tempe Town Lake and Rio Salado riverbed in north Tempe neighborhoods and locations accessible to the public.



The overall number of large aircraft operations over Tempe increased in 2011 compared to 2010, which included increases in nighttime operations. The way Ldn (A) is calculated makes it sensitive to any increases in nighttime operations.



Combined with a decrease in the volume of departures to the east the Ldn (A) average was down 0.1% compared to that average reached in 2010.

