

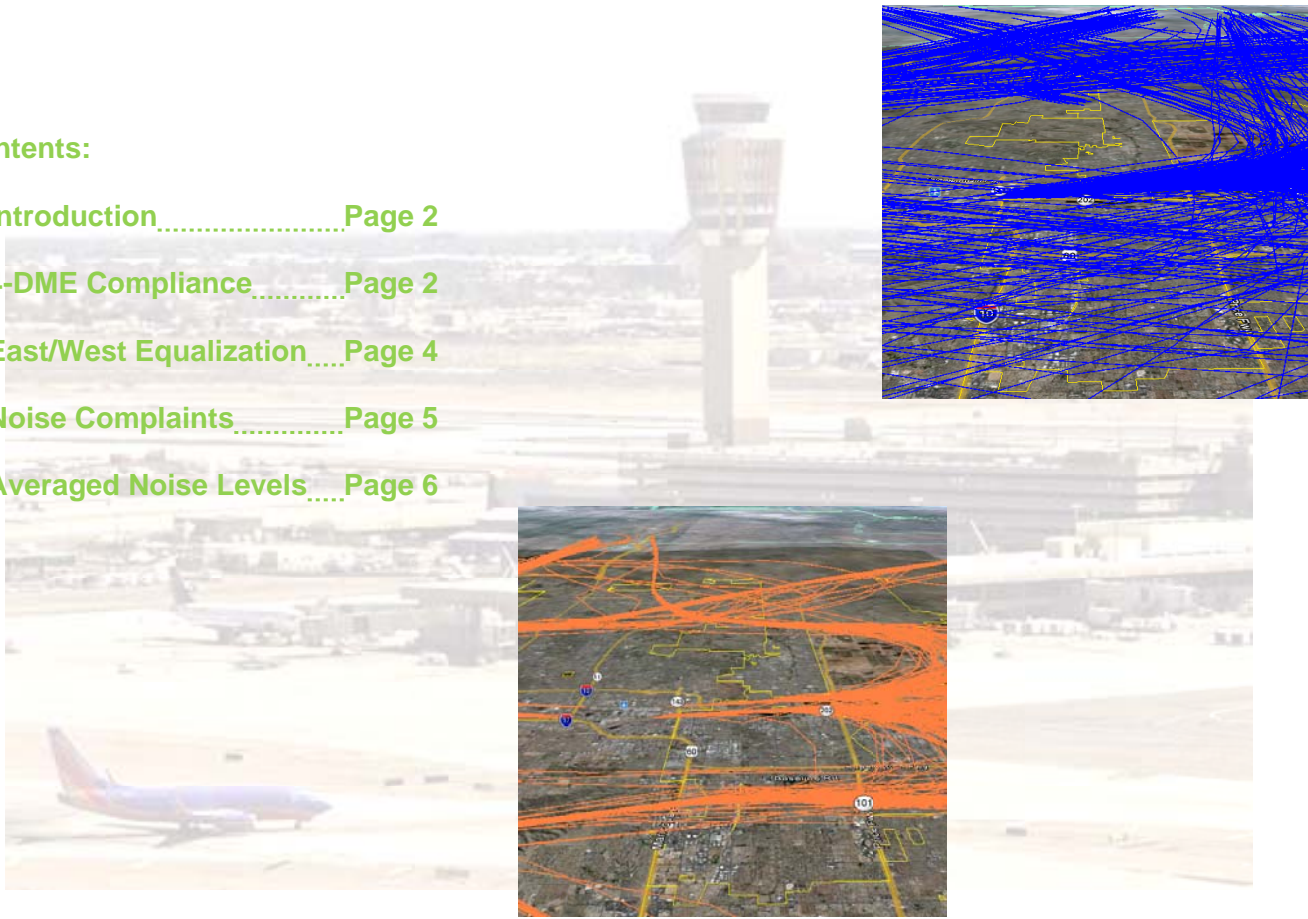


# 2013

# Noise Mitigation Monitoring Summary PHX East

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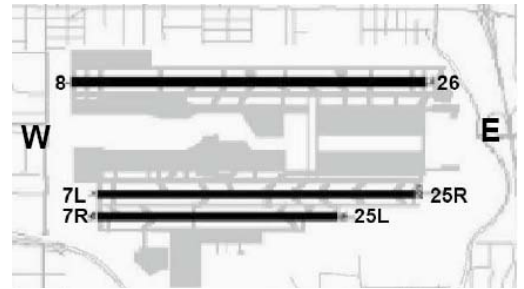


Report prepared for TAVCO  
 by the City of Tempe  
 255 East Marigold Lane  
 Tempe, AZ 85281



## 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:



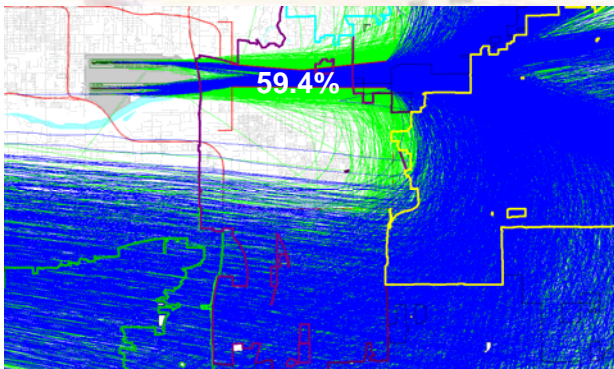
The City of Phoenix implemented a gate the large aircraft had to pass through to avoid violating the procedure. This is an imaginary vertical line at 4-DME used as a filter in the Noise and Flight Track Monitoring System (NFTMS) for the Phoenix Sky Harbor International Airport. TAVCO developed a “Corridor”, which was based on Standard Instrument Departure procedures that were in use when the intergovernmental agreement with the City of Phoenix was made.

- 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.

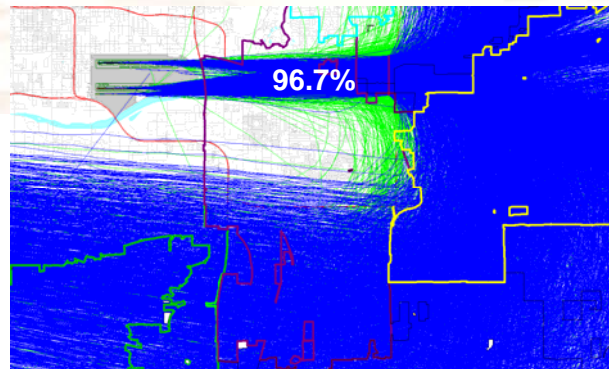
## 2. 4-DME Compliance

### 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.



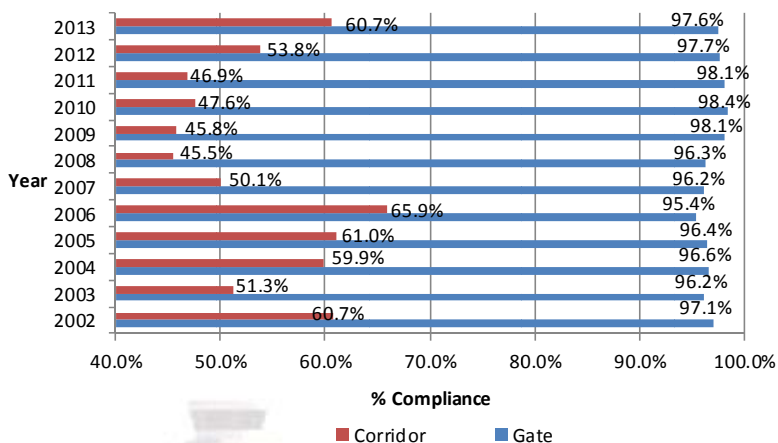
Jet departure tracks during the month of December 2013 inside the Tempe Corridor are shown in blue color.



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.

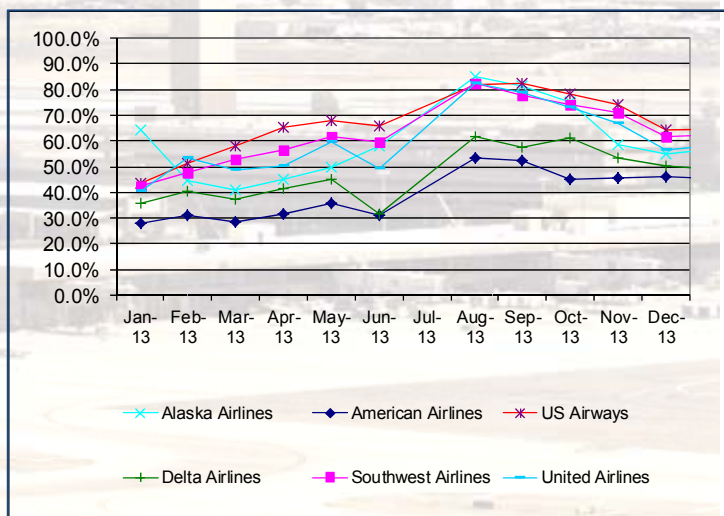
The annual average compliance rates are based on monthly numbers from the TAVCO Noise Mitigation Monitoring Reports. The November and December 2005 reports did not include exclusions of aircraft deviations because of weather as was done for previous months and years due to missing data provided by the 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 have negatively impacted large commercial jets' climb trajectory over Tempe.



Compared to 2012 daytime jet and large turboprop departures towards the east decreased 0.4%, and night-time departures increased 0.6%. Overall departures and arrival operations by these aircraft east of the airport decreased 1% compared to 2012.

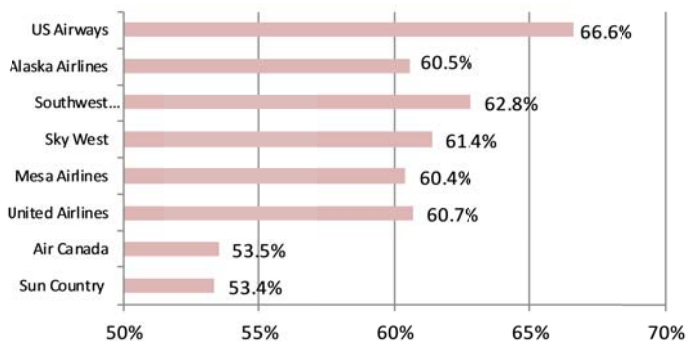
Large Carrier Compliance

The graph shows corridor compliance rates for some of the airport's busiest airlines.



Among the larger carriers, US Airways had on average best compliance with the Tempe Corridor during 2013. In 2012, the airline reached 62.3% compliance with the Tempe Corridor. Only airlines with on average ≥10 departures to the east per month are included.

**Airline Compliance w. Tempe Corridor 2013**

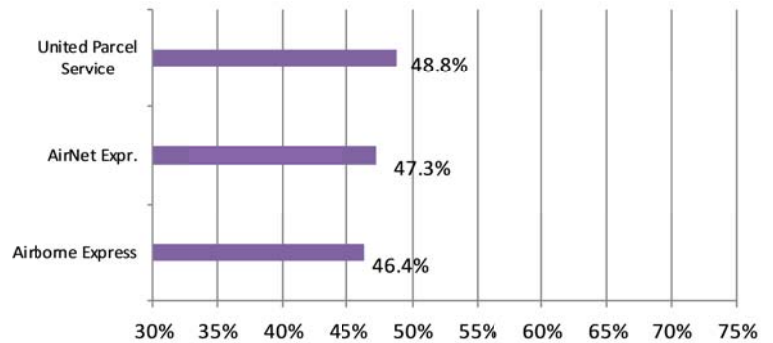




Top All Cargo Carriers

Among the larger, all cargo carriers UPS had on average best compliance with the Tempe Corridor during 2013. The top three cargo airlines have failed to reach 50% or higher corridor compliance since 2008.

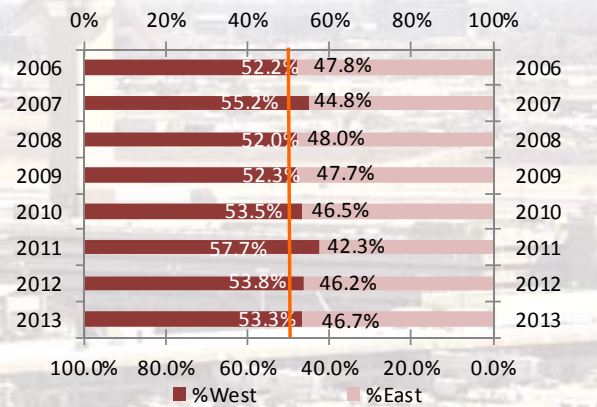
All Cargo Airline Compliance w. Tempe Corridor 2012



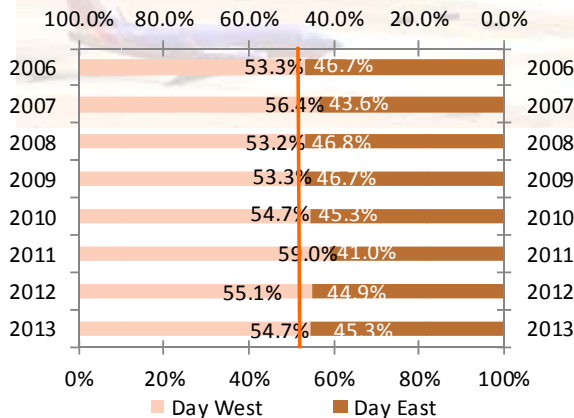
3. East/West Departure Split

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 day- and 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)

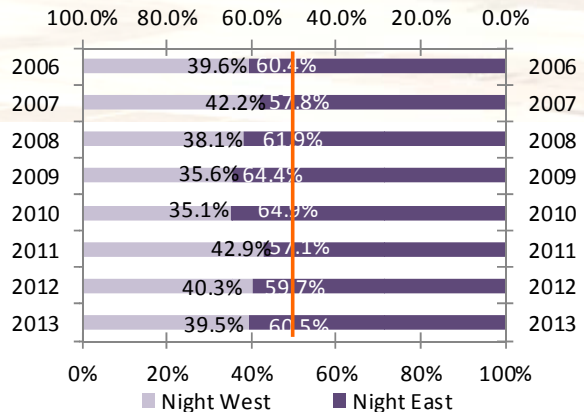


Day Equalization



Day = 7: 00 a.m. to 10:00 p.m. local time

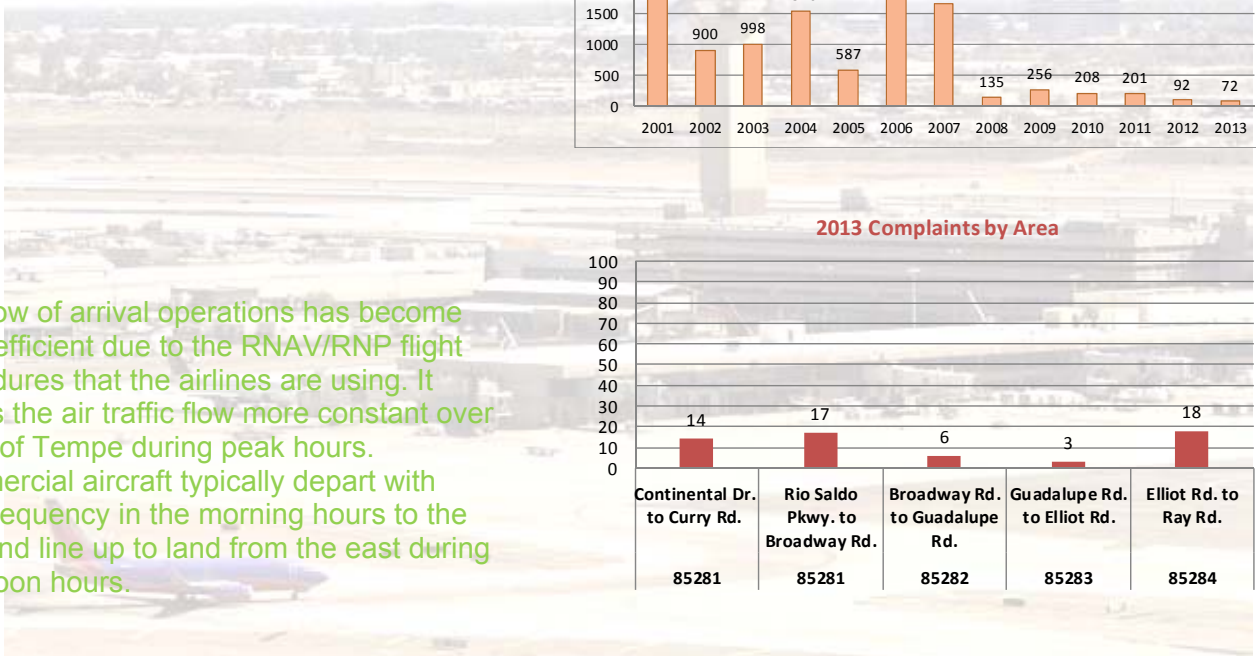
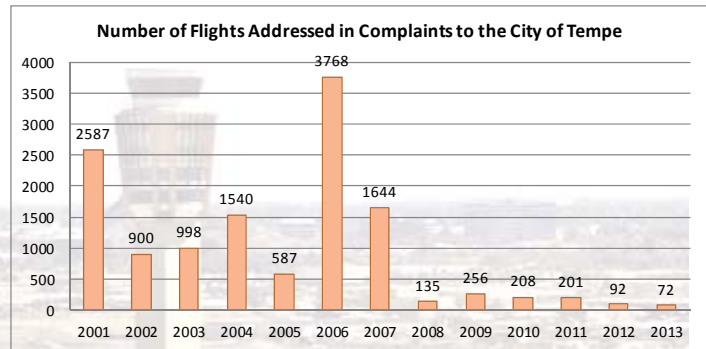
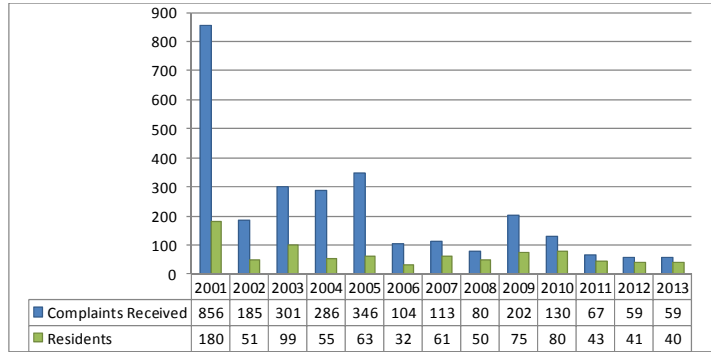
Night Equalization



Night = 10:00 p.m. to 7:00 a.m.

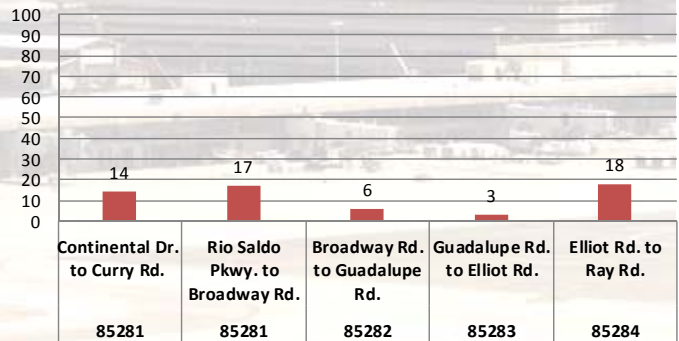
### 4. Complaints

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 living in north Tempe neighborhoods where aircraft are at lower altitudes.

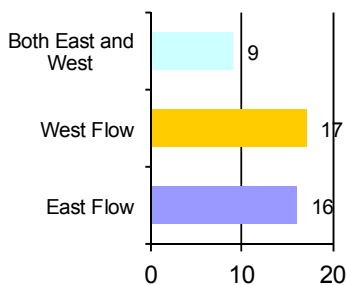


The flow of arrival operations has become more efficient due to the RNAV/RNP flight procedures that the airlines are using. It makes the air traffic flow more constant over areas of Tempe during peak hours. Commercial aircraft typically depart with high frequency in the morning hours to the east and line up to land from the east during afternoon hours.

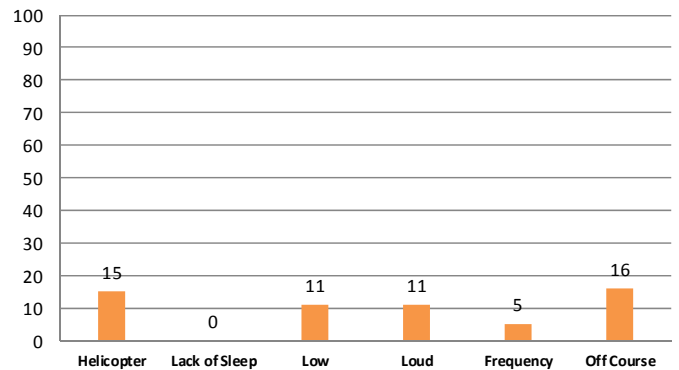
2013 Complaints by Area



Reported Overflights by PHX Traffic Flow



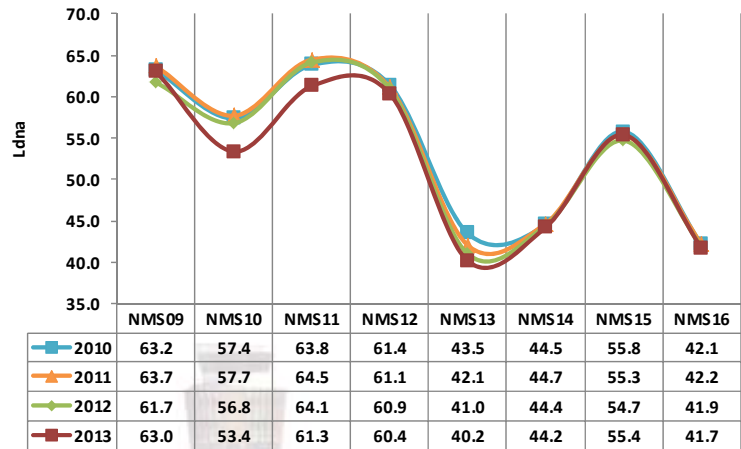
2013 Complaints by Disturbance



## 5. Averaged Noise Levels

Annual (Day-Night) average sound level, Ldn (A), registered at fixed monitoring sites operated by the City of Phoenix, decreased somewhat during 2013, except at monitors located the farthest away from the riverbed.

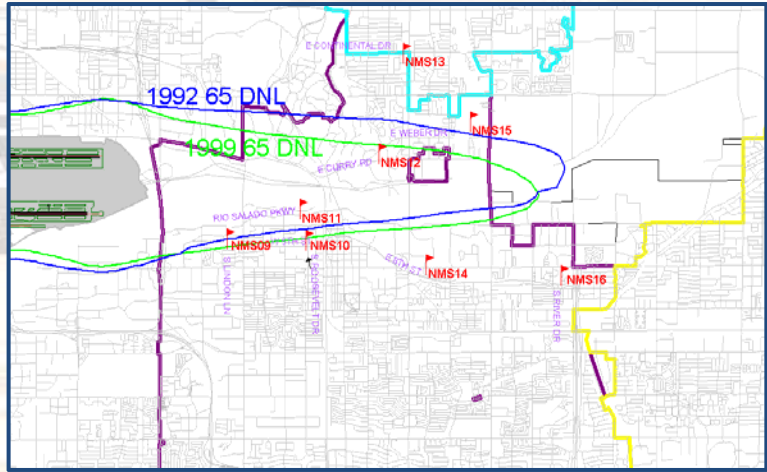
LDNA Annual Energy Average



Noise Monitoring Sites



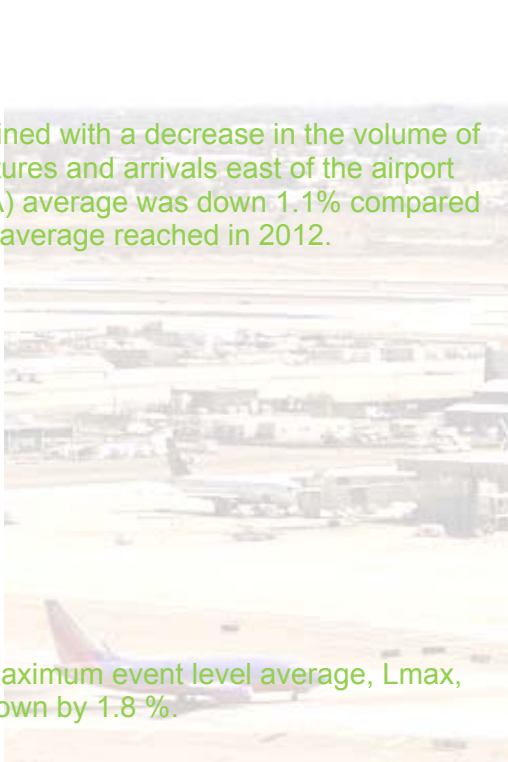
Eight noise monitoring sites are located in Tempe north and south of the Salt River riverbed in neighborhoods close to the main flight paths for the Phoenix Sky Harbor International Airport.



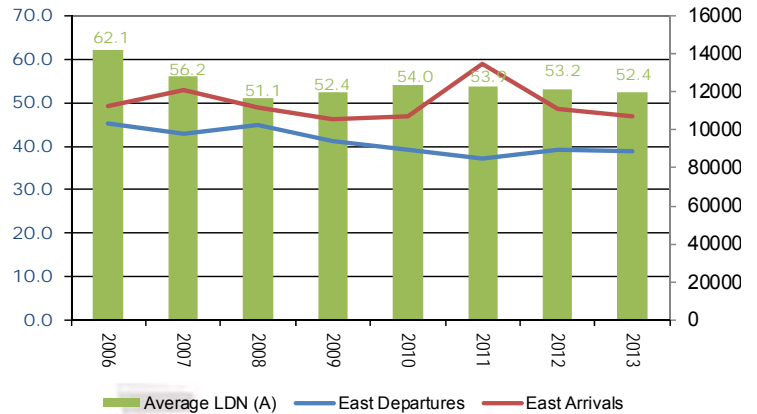
The overall number of large aircraft operations over Tempe decreased in 2013 compared to 2012, which included decreases in nighttime operations. The way Ldn (A-weighted) sound level is calculated makes it sensitive to any changes in the number of nighttime operations.

Combined with a decrease in the volume of departures and arrivals east of the airport Ldn (A) average was down 1.1% compared to the average reached in 2012.

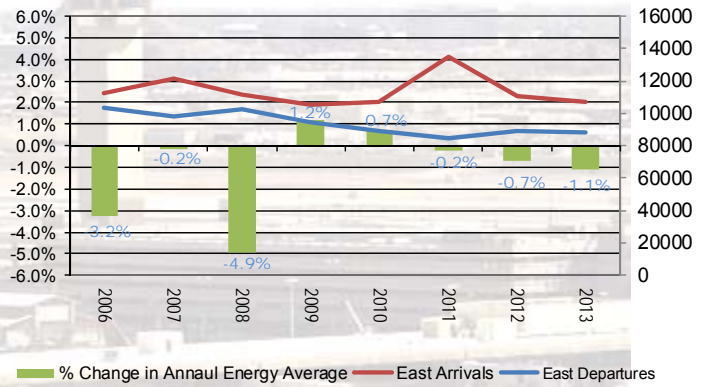
The maximum event level average, Lmax, was down by 1.8%.



Aircraft Noise Development  
Change in Average Ldn A



Aircraft Noise Development  
Percent Change in Average Leq A



Aircraft Noise Development  
Percent Change in Average LMax

