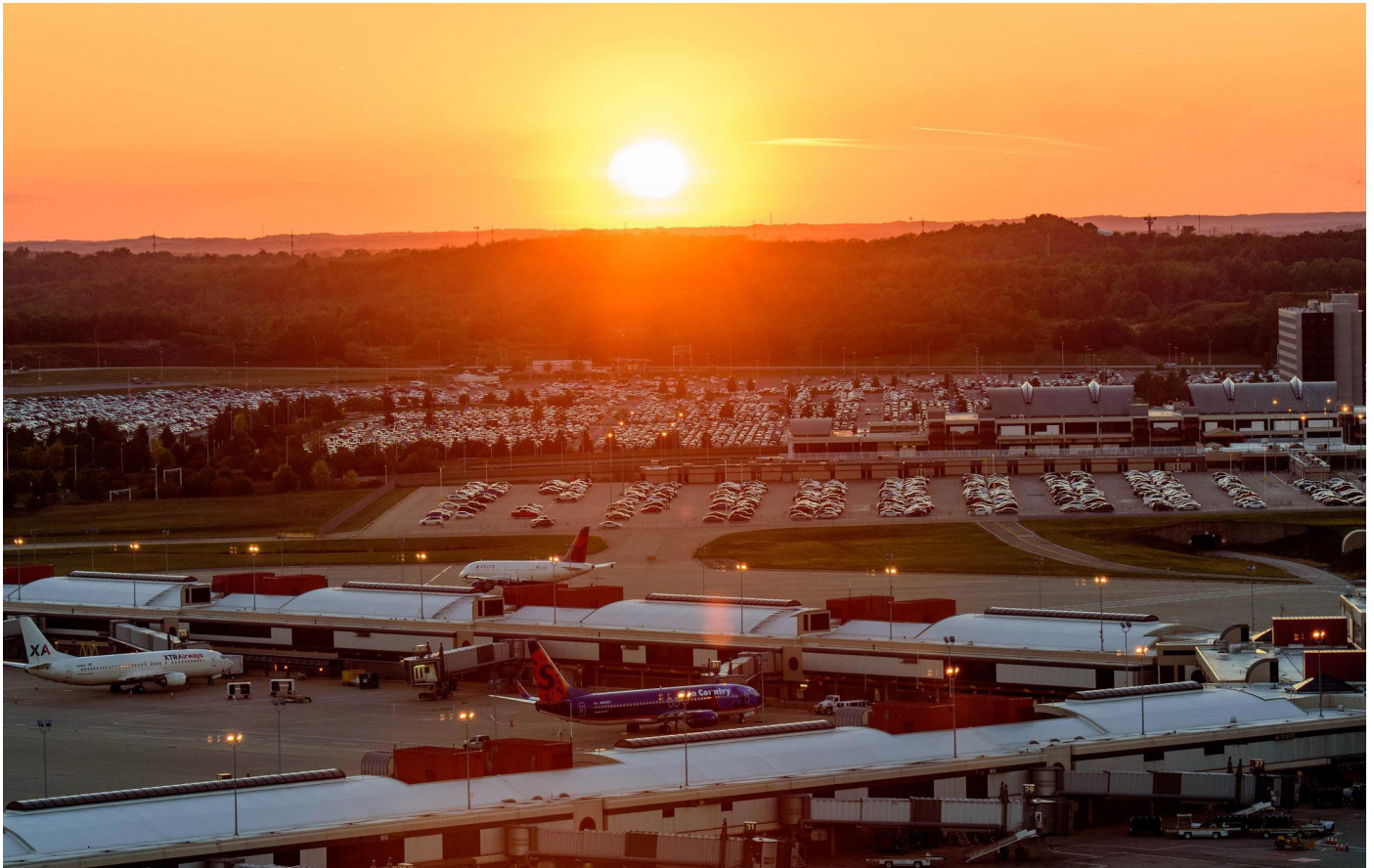




PITTSBURGH  
INTERNATIONAL AIRPORT

NOISE EXPOSURE  
MAPS UPDATE



## INTRODUCTION

The Allegheny County Airport Authority (ACAA) recently reassessed the impact of aircraft noise on communities in the vicinity of Pittsburgh International Airport (PIT or the Airport). New noise contours were generated to estimate aircraft noise impacts in 2015 and to forecast impacts for 2021.

The updated contours are being submitted to the Federal Aviation Administration (FAA) as a formal request to update the Noise Exposure Maps (NEMs) that were previously generated in 2006 and approved in 2007 under the provisions of Federal Aviation Regulations (FAR) 14 of the Code of Federal Regulations (CFR) Part 150, Airport Noise Compatibility Planning. The NEMs that were approved in 2007 estimated conditions in 2005 (Existing Case) and 2010 (Recommended Future). As further described in this informational handout, major changes have occurred in the type and amount of aircraft activity at PIT since that time and warrant an update of the Airport's NEMs.

In 1993, the FAA approved a Noise Compatibility Program (NCP) for PIT that established measures for reducing the impact of the Airport's operation on surrounding communities. These measures remain in place today and have continued to be very effective in minimizing the noise impact of aircraft operations. Consequently, there is no need to update PIT's NCP at this time. Noise mitigation measures from PIT's NCP are summarized in this informational handout.

# PIT'S CHANGING AIRCRAFT ACTIVITY

Aircraft noise contours associated with activity at PIT have reduced in size since the last FAA-approved NEMs were generated in 2006. The reduction is primarily due to the drop in total amount of aircraft activity since 2006 with some reduction caused by the transition to a quieter fleet.

TABLE 1: AVERAGE ANNUAL DAILY OPERATIONS <sup>1/</sup>				
CATEGORY	2007 FAA-APPROVED NEMs		UPDATED NEMs	
	EXISTING 2005	FUTURE 2010	EXISTING 2015	FUTURE 2021
Air Carrier/Commuter	772	646	231	305
Cargo	20	20	12 <sup>2/</sup>	13
General Aviation/Air Taxi	70	70	128	56
Military	19	28	17	22
<b>Total</b>	<b>881</b>	<b>764</b>	<b>388</b>	<b>396</b>

**NOTES:**

1/ An operation is defined as one landing or one takeoff.  
 2/ Cargo operations for 2015 are estimated.

**SOURCE:** Allegheny County Airport Authority, Pittsburgh International Airport Noise Exposure Maps Update, June 2006 (2007 FAA-Approved NEMs); Allegheny County Airport Authority, 14 CFR Part 150 Noise Exposure Maps Update, September 2016 (Updated NEMs).

**PREPARED BY:** Ricondo & Associates, Inc., November 2016.

Aircraft noise analyses are conducted for an average annual day of activity. Typically, a 12-month period of data is analyzed and then averaged, dividing by 365, to arrive at an “average annual day”. **Table 1** lists the activity assumptions for an average annual day in the previously approved NEMs and in the current NEM analysis. A significant reduction in operations is evident, especially for the larger air carrier aircraft. Since 2006, PIT’s dominant carrier converted its operations

at PIT to a higher proportion of quieter regional jet aircraft and then reduced overall activity at PIT. Total aircraft operations (take-off and landings) estimated for 2021 are approximately 50 percent less than those estimated for 2010 in the previous FAA-approved NEMs.

Consistent with the requirements of FAR Part 150, the updated noise contours for PIT were developed using the FAA’s Integrated Noise Model (INM). The INM is a computer model developed by the FAA after many years of research and testing. Aircraft activity and airfield operational data specific to PIT were inputs to the INM. Using this information and the model’s internal database, the INM calculated noise exposure levels and produced Day/Night Average Sound Level (DNL) noise contours for PIT.



The DNL metric is a measurement of community noise exposure and was introduced by the Environmental Protection Agency as a method for predicting the effects of the average long-term exposure of environmental noise on the population. The Federal Department of Housing and Urban Development’s regulations also include DNL as the standard for measuring outdoor noise environments. The DNL is the 24-hour average sound level and takes into account the times when an airport is busy and the times when it is not busy. The metric adds a 10-decibel penalty to aircraft events occurring between 10 p.m. and 7 a.m.

DNL relates to land use compatibility guidelines as illustrated in **Table 2**. All land uses in areas of less than DNL 65 dBA are generally considered by the FAA as compatible with airport operations. Noise attenuation should be included in the design and construction of residential and other noise-sensitive facilities in areas greater than DNL 65 dBA. It is the FAA’s policy to fund noise mitigation programs such as sound insulation in areas of DNL 65 dBA or greater

**TABLE 2: LAND USE GUIDELINES**

LAND USE CATEGORY	< DNL	DNL	DNL	> DNL
	65 dBA	65-70 dBA	70-75 dBA	75 dBA
RESIDENTIAL (e.g. Single Family, Apartments, Mobile Homes)	Acceptable	Normally Acceptable <sup>1/</sup>	Normally Acceptable <sup>1/</sup>	Not Acceptable
PUBLIC / SEMI-PUBLIC (e.g. Schools, Hospitals, Churches)	Acceptable	Acceptable <sup>1/</sup>	Acceptable <sup>1/</sup>	Not Acceptable
COMMERICAL (e.g. Office, Wholesale/Retail Trade)	Acceptable	Acceptable	Acceptable <sup>1/</sup>	Acceptable <sup>1/</sup>
MANUFACTURING AND PRODUCTION (e.g. Manufacturing, Agriculture, Mining)	Acceptable	Acceptable	Acceptable <sup>1/</sup>	Acceptable <sup>1/</sup>
RECREATIONAL AND OPEN SPACE (e.g. Parks, Amusement Centers, Golf Courses)	Acceptable	Acceptable <sup>2/</sup>	Acceptable <sup>2/</sup>	Not Acceptable

**NOTES:**

1/ Can be acceptable if appropriate sound-level reduction measures are taken.

2/ Certain uses are excluded.

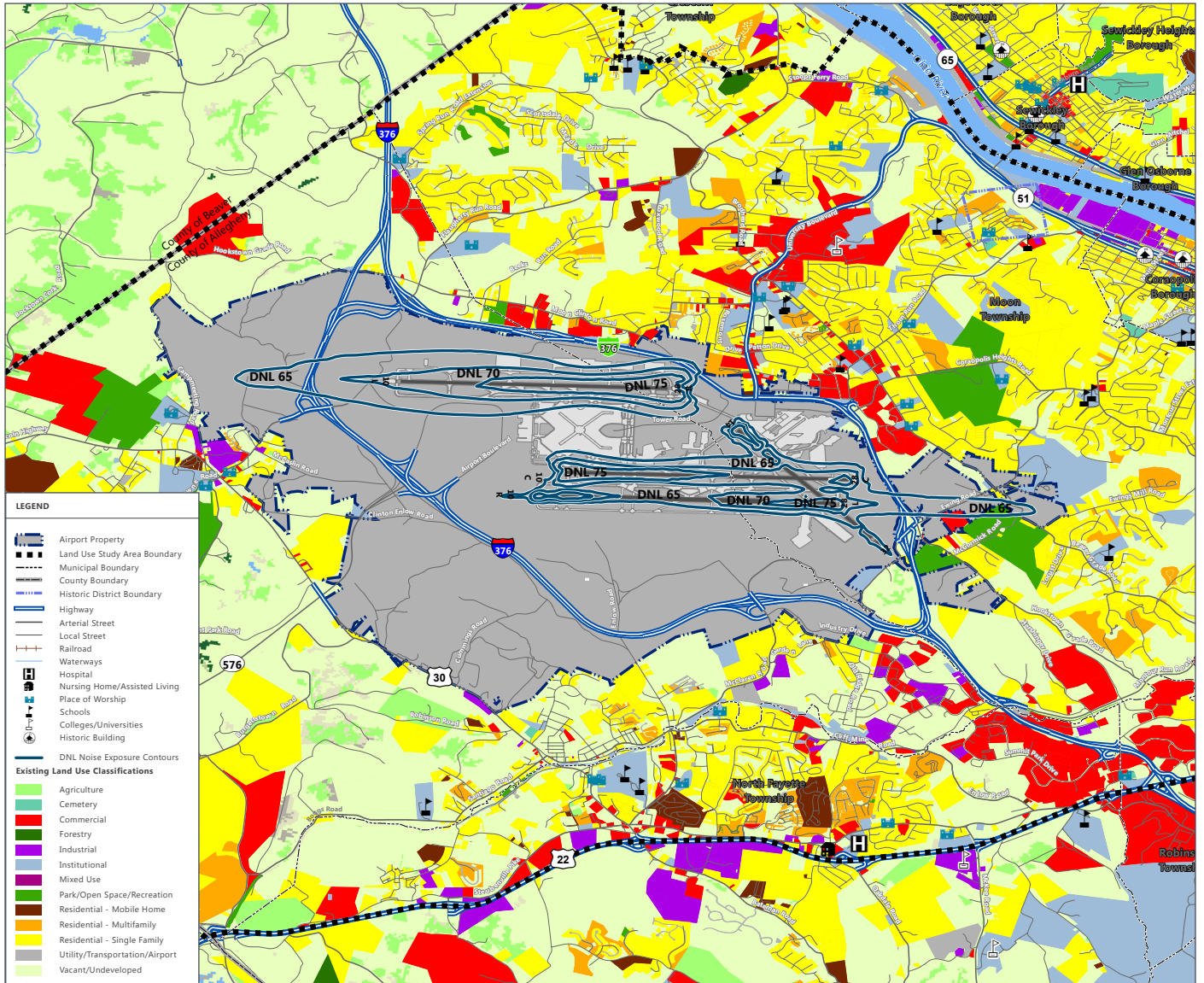
**SOURCE:** Adapted from Federal Aviation Regulations 14 CFR Part 150, Airport Noise Compatibility Planning, September 2004

**PREPARED BY:** Ricondo and Associates, Inc., November 2016.

**Figures 1 and 2**, on Pages 4 and 5, depict contours for 2015 conditions and for a forecasted condition in 2021. The 2015 contours are based on a 12-month period of analyses of activity at PIT from January 2015 through December 2015. The 2021 contours are based on the current Airport Master Plan Update, Aviation Activity Forecast, which was approved by the FAA in February 2015. The forecast was developed through an analysis of the historical relationship between aviation activity and regional and national socioeconomics. Published fleet plans were used to develop the passenger and cargo airline operations and fleet mix forecast. The operations forecasts were then refined based on expectations of future service by the airlines serving the Airport. The 2015 daily schedule was used as the basis for developing the 2021 schedule. As can be seen between Figures 1 and 2, there is practically no change in the noise contours between the 2015 and 2021.



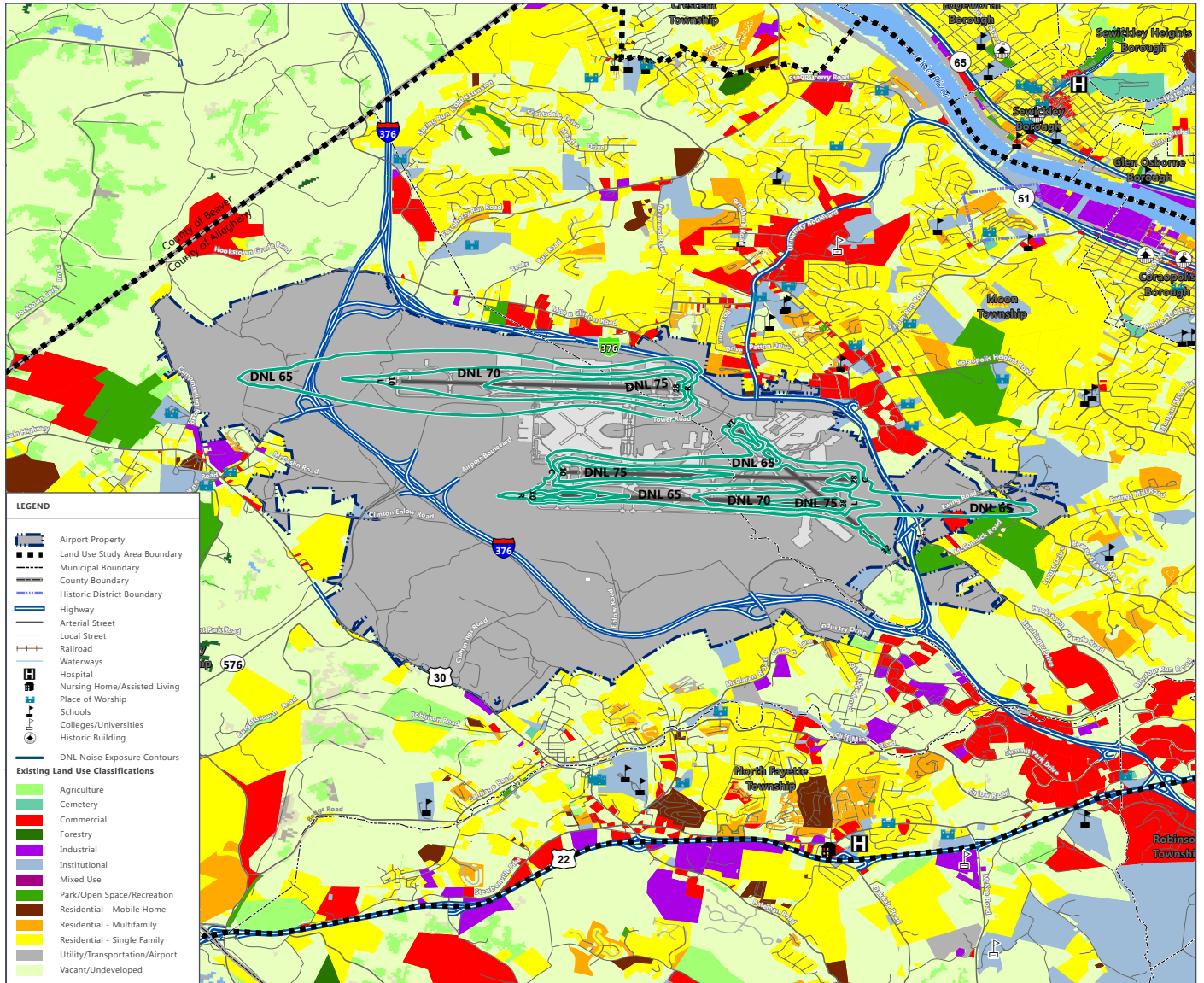
**FIGURE 1: 2015 NOISE EXPOSURE**



**SOURCES:** Allegheny County Airport Authority, Pittsburgh International Airport Layout Plan, 2015 (airfield and airport property boundary); Pennsylvania Spatial Data Access, 2015 (County of Allegheny parcel boundaries, Pennsylvania Department of Transportation roads, water bodies); South western Pennsylvania Commission, 2015 (schools, municipal boundaries); U.S. Geological Survey, National Land Cover Database, 2011 (existing land use); Western Pennsylvania Regional Data Center, Allegheny County Property Assessments, October 2015 (existing land use); Ricondo and Associates, Inc., March 2016 (2015 DNL contours).

**PREPARED BY:** Ricondo & Associates, Inc., March 2016.

**FIGURE 2: 2021 FORECAST NOISE EXPOSURE**



**SOURCES:** Allegheny County Airport Authority, Pittsburgh International Airport Layout Plan, 2015 (airfield and airport property boundary); Pennsylvania Spatial Data Access, 2015 (County of Allegheny parcel boundaries, Pennsylvania Department of Transportation roads, water bodies); South western Pennsylvania Commission, 2015 (schools, municipal boundaries); U.S. Geological Survey, National Land Cover Database, 2011 (existing land use); Western Pennsylvania Regional Data Center, Allegheny County Property Assessments, October 2015 (existing land use); Ricondo and Associates, Inc., March 2016 (2021 DNL contours).

**PREPARED BY:** Ricondo & Associates, Inc., March 2016.

As shown in **Table 3**, the NEMs approved by the FAA in 2007 showed 18 residents in areas of DNL 65 dBA or greater. Since 2007, the noise contours have reduced in size and the recent NEM study has determined that the number of residents residing in levels of DNL 65 or greater in 2015 was zero and the number in 2021 will remain at zero.

TABLE 3: AFFECTED POPULATION				
LEVEL	2007 FAA-APPROVED NEMs		UPDATED NEMs	
	Existing 2005	Future 2010	Existing 2015	Future 2021
DNL 75 dBA+	0	0	0	0
DNL 70-75 dBA	0	0	0	0
DNL 65-70 dBA	18	18	0	0
<b>Total</b>	<b>18</b>	<b>18</b>	<b>0</b>	<b>0</b>

**SOURCE:** Allegheny County Airport Authority, Pittsburgh International Airport Noise Exposure Maps Update, June 2006 (2007 FAA-Approved NEMs); Allegheny County Airport Authority, 14 CFR Part 150 Noise Exposure Maps Update, September 2016 (Updated NEMs).

**PREPARED BY:** Ricondo & Associates, Inc., November 2016.

## MEASURES IN PLACE TO MINIMIZE AIRCRAFT NOISE IMPACTS

Since 1980, Allegheny County has been actively involved in a program to minimize aircraft noise impacts to residents near the Airport. The success of these programs depends upon the continued cooperation of FAA Air Traffic Control (ATC) personnel, airlines, pilots, and township planners and officials.

Three types of measures have been implemented to reduce aircraft noise to communities in the vicinity of the Airport:

- Operational measures to direct aircraft noise away from populated areas;
- Remedial measures, such as sound insulation and land acquisition, to alleviate impacts to existing, noise-sensitive uses located within areas where noise levels were considered to be significant; and
- Land use measures taken by townships to discourage further development of noise-sensitive uses in areas affected by aircraft noise.

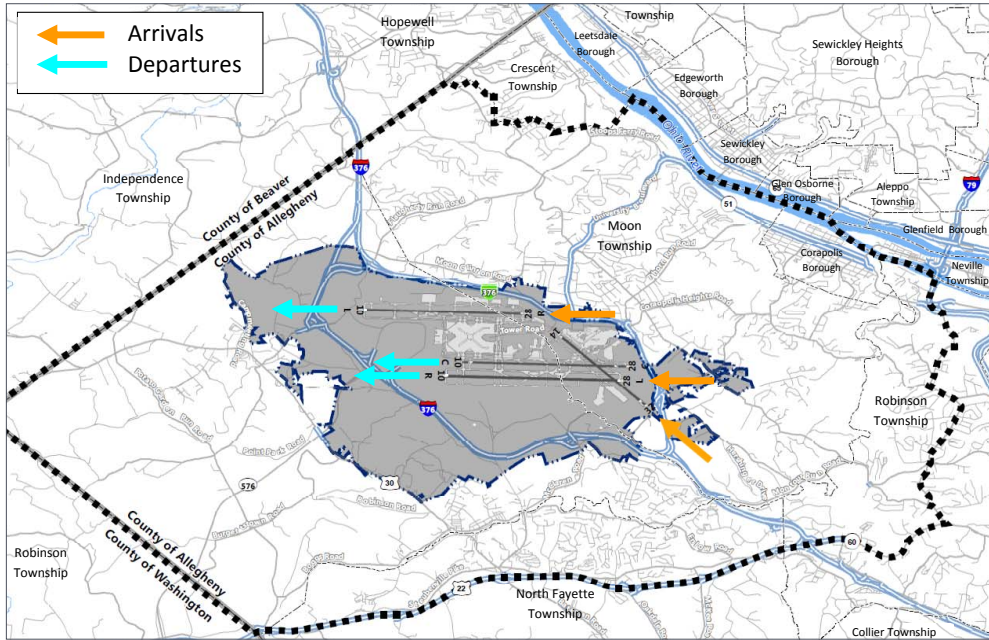
This approach has been so successful that today there are no incompatible land uses in the vicinity of PIT that are affected by significant levels of aircraft noise.

### OPERATIONAL MEASURES

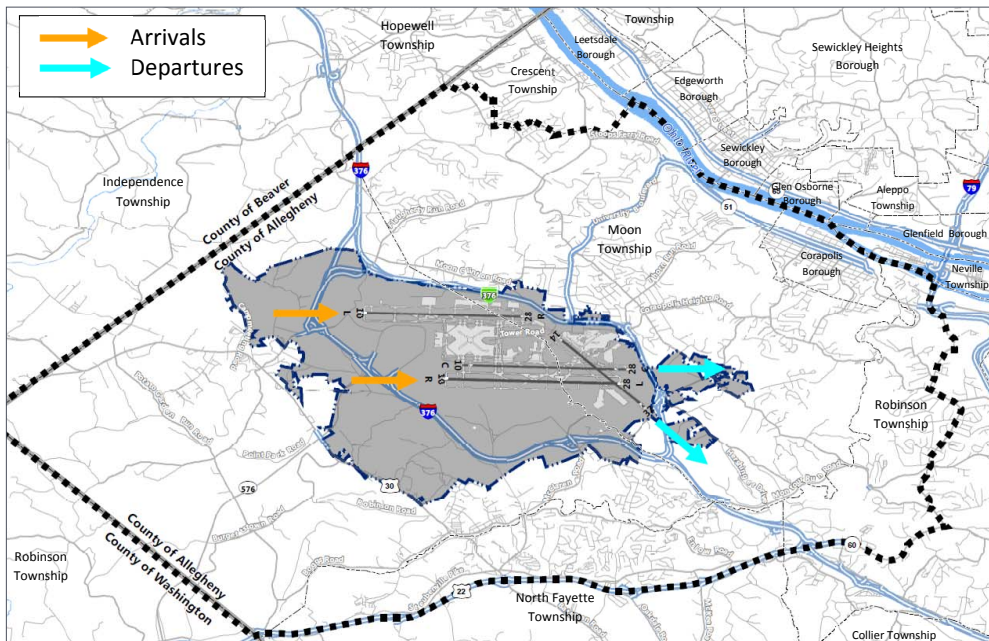
Operational measures pertain to those actions that can be taken to operate the airfield or for the pilots to use when arriving or departing from an airport. Operational strategies have been in place at PIT since the early 1980s and are still effective today. These strategies apply to jet aircraft only and are to be used when wind, weather, safety, and capacity conditions permit. Also the measures do not apply when PIT’s runways or taxiways are under construction. The strategies are detailed on Pages 7, 8, and 9.



**FIGURE 3: PREFERENTIAL DAYTIME RUNWAY USE - WESTERLY FLOW**

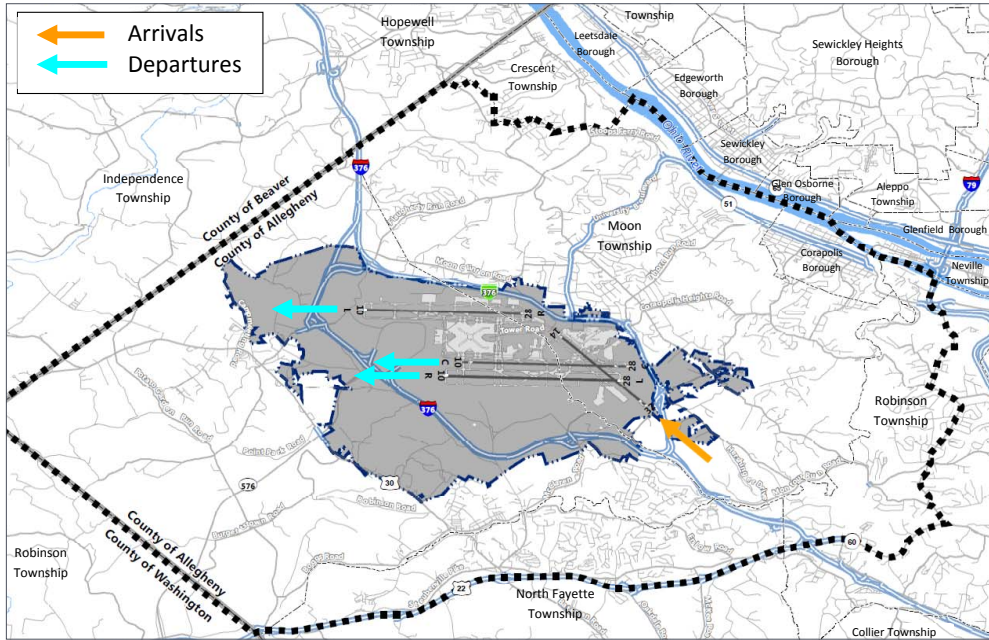


**FIGURE 4: DAYTIME RUNWAY USE - EASTERLY FLOW**

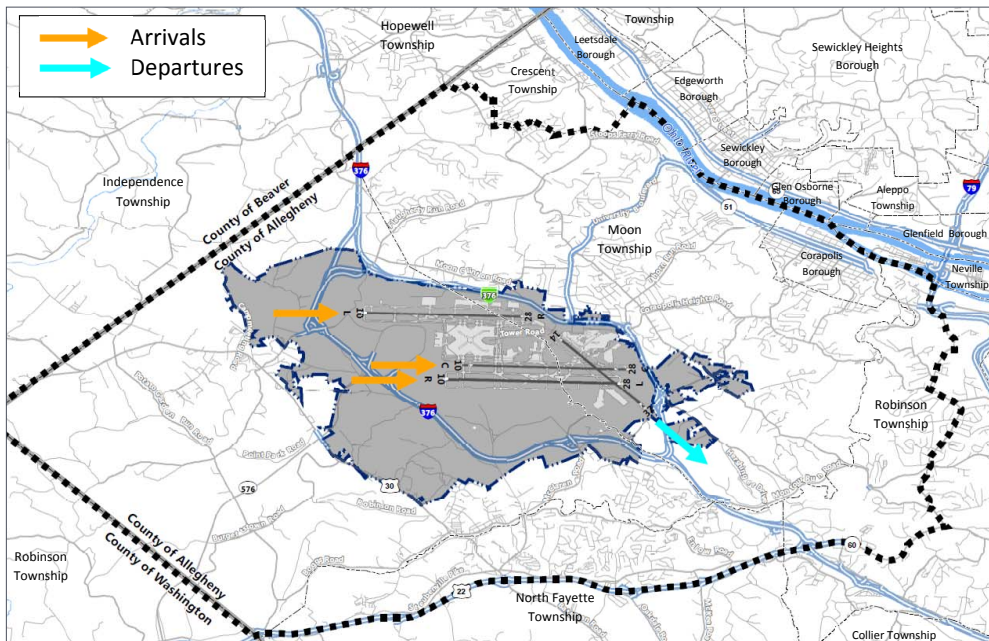


**Preferential Daytime Runway Use:** The operational flow of PIT's airfield is dictated by prevailing wind conditions. The airfield can be operated in a westerly flow approximately 80 percent of the year, taking advantage of the period when winds are calm as well as when the winds dictate a westerly flow (Figure 3). By maximizing a westerly flow, departures (which usually generate more noise than arrivals) occur more frequently over areas west of the Airport. These areas are less densely populated than those areas to the east. During the 20 percent of the year when departures occur to the east, jet departures are not permitted on Runway 10L (Figure 4).

**FIGURE 5: PREFERENTIAL NIGHTTIME RUNWAY USE - WESTERLY FLOW**



**FIGURE 6: REFERENTIAL NIGHTTIME RUNWAY USE - EASTERLY FLOW**

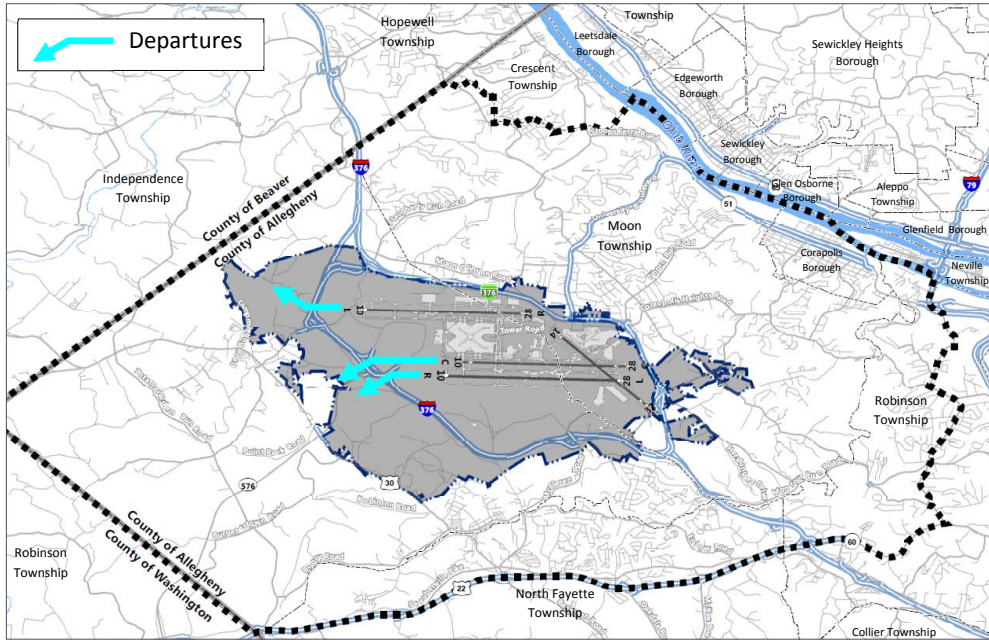


**Preferential Nighttime Runway Use:** Nighttime refers to the period of 10 p.m. to 7 a.m. During these hours, arriving aircraft are assigned to Runway 32 or to Runways 10L (preferred), 10R and 10C, depending on whether the airfield is being operated in a west flow or an east flow.

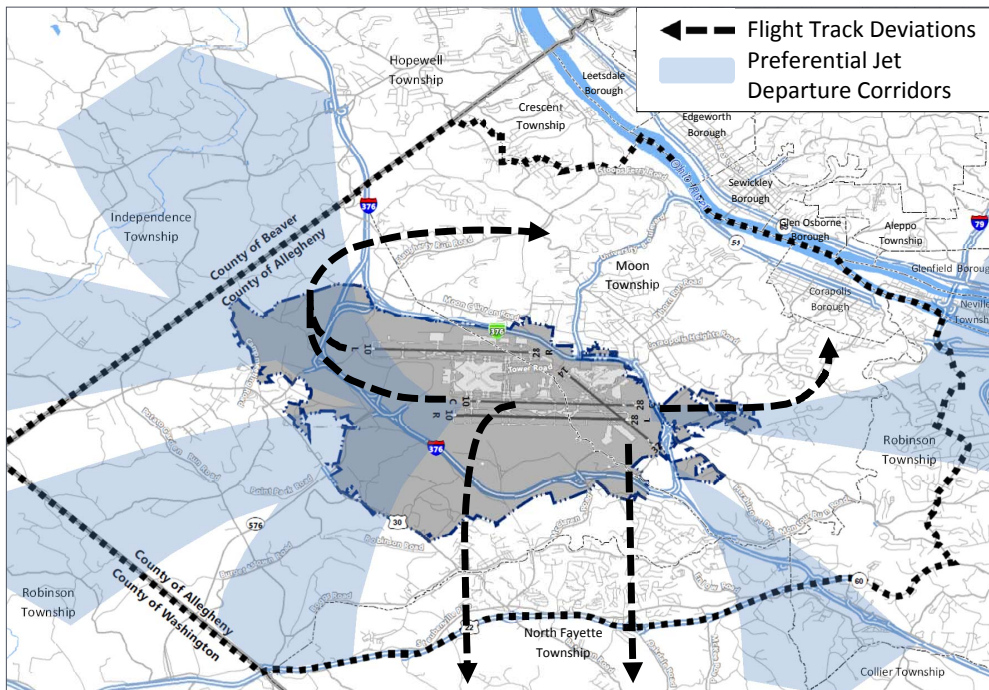
Departures are assigned to Runway 14 in an easterly flow and to Runways 28R (preferred), 28L, and 28C in a west flow (Figures 5 and 6). This noise mitigation measure places aircraft over more compatible land uses (i.e., commercial land uses in Robinson Township) toward the southeast and less populated areas west of PIT during noise-sensitive nighttime hours.



**FIGURE 7: DESTINATION ASSIGNMENT FOR WESTERLY DEPARTURES**



**FIGURE 8: PREFERENTIAL DEPARTURE CORRIDORS**



north of PIT.

**Preferential Engine Maintenance Run-up Locations:** Procedures have also been developed by the ACAA to mitigate the impact of aircraft engine run-ups that are conducted for maintenance purposes. The procedures specify the location at which run-ups can be performed. Run-ups are not permitted during nighttime hours unless prior approval has been obtained from ACAA Airport Operations.

**Destination Assignment for Westerly Departures:**

Departure procedures have been implemented to minimize overflights of Clinton. This community is located directly west of PIT between the extended centerlines of Runways 10L-28R and 10R-28L. To the maximum extent possible, ATC assigns north and eastbound aircraft to Runway 28R with south and westbound aircraft assigned to Runways 28C or 28L (Figure 7). This noise mitigation strategy turns most aircraft to the north or south before flying directly over the Clinton community.

**Preferential Departure Corridors:**

Preferential departure corridors are used to the extent possible to deter aircraft overflights of noise-sensitive residential areas to the north, east, and south of PIT. As illustrated in Figure 8, the preferential departure corridors are intended to avoid overflights of: Imperial, Wyndham Farms, and Westbury to the south; Londonbury to the east; and residential areas of Moon Township directly

## REMEDIAL MEASURES

Allegheny County began acquiring incompatible land uses for the purposes of mitigating aircraft noise in the late 1970s and acquisition continued throughout the 1980s. Much of the acquisition was associated with the opening of Runway 10R-28L in April 1980. The acquisition program focused on single-family homes located within noise levels of DNL 75 dBA, based upon noise contours that were appropriate at that point in time.

In 1990, Allegheny County started a residential sound insulation program (RSIP) for the purposes of mitigating noise impacts in residential areas where noise levels were considered to be significant, but not severe enough to warrant acquisition. Since 1993, the DNL 65 dBA contour on the Recommended Future (1996) NEM has been used to determine whether or not noise levels were considered as being significant. All owner-occupants of single-family residences within this level were offered the opportunity to have their home treated to reduce interior noise levels under the provisions of the RSIP. Participating homeowners granted an aerial easement, i.e. permission for aircraft overflights, in exchange for having their homes treated.

In 1997, PIT's NCP was amended to enable the ACAA to compensate homeowners monetarily in exchange for an aerial easement. This option was provided to qualifying homeowners that did not wish to receive sound insulation and preferred to be compensated for granting the right for aircraft to fly over their home. Many homeowners took advantage of the sound insulation program or compensated aerial easement options that were offered by PIT's NCP. Although the RSIP program is now completed, approximately 500 homes received treatment under the program or as a result of noise litigation.

## LAND USE MEASURES

Land use management measures have been adopted by Findlay and Moon Townships to promote the development of compatible land uses in areas that experience aircraft noise levels. A significant portion of Findlay's 2004 Comprehensive Plan addresses the issue of establishing compatibility between the Airport's operation and land development. Compatibility is addressed from the standpoint of aircraft noise as well as protecting the safety of PIT's airspace from height obstructions. In addition, Findlay Township has an Airport Noise Exposure Overlay District in its zoning ordinance. The overlay district uses a previous DNL 65 dBA contour for establishing the boundary of the district.

The Moon Township Comprehensive Plan (2000) recognizes the influence of the Airport on the Township's development patterns and approximates an Airport Impact Area. Planned land uses in noise impact areas include commerce and business parks. Much of the Plan's residential neighborhood area that is beneath PIT's flight paths has already been developed by residential uses. Many of these homes received sound insulation from ACAA-sponsored and FAA-funded programs.



# WHAT'S NEXT FOR PIT'S NOISE COMPATIBILITY PROGRAM?

2016 marks the 36th year since the Allegheny County Department of Aviation and its successor, the ACAA, began in earnest to chart a course for achieving compatibility between PIT and its communities. Working together with the FAA, Pittsburgh ATC, the airlines and the military serving PIT, pilots, and township planners and officials, the ACAA has achieved the once, long-term objective of establishing PIT's compatibility with its surroundings.

Operational measures in place today have been beneficial in directing aircraft noise away from populated areas. Township planners and officials have taken steps to promote compatible development in areas significantly impacted by aircraft noise. Noise-sensitive, incompatible land uses have been acquired or have been treated to enhance their compatibility with aircraft noise levels of DNL 65 dBA. No additional steps are necessary at this time.

