

CHAPTER 6 NOISE EXPOSURE

FAA requires that the NEM submitted for review represent the aircraft noise exposure for the year of submittal (in this case 2008) and for a future year (2013 for OSUA). However, since the analysis conducted for the OSUA 14 CFR Part 150 Study used data for 2007 (because the Study began prior to the year of submittal), recent operational activity at the Airport was reviewed. This review was made to determine whether the initial year and future year DNL contours analyzed in this Study (2007 and 2012) were significantly different from those that occur in the year of submittal (2008) and in the future year (2013).

As indicated in **Appendix G**, a review of the 2008 forecasted operations indicated that the 2008 operational activity did not significantly change (1.9% more in 2008) from the 2007 operational data. In addition, a review of the projected 2013 operations from the forecast presented in Chapter 2, indicated an increase in operations of 1.9% over the operational numbers for 2012. Both scenarios are well within the 15% change in operations allowance permitted by the FAA to still be considered representative of modeled conditions. Therefore, to be consistent with FAA guidelines, the two OSUA NEMs are considered to be representative of the aircraft noise exposure at the Airport for the years 2008 and 2013.

It should also be noted that the 65, 70, and 75 DNL contours are the only contours required by the FAA for inclusion in the 14 CFR Part 150 Study and for acceptance by them for the two NEMs. The 2013 future NEM DNL contours reflect a condition that would occur without the implementation of the Noise Compatibility Program (NCP). The 2027 DNL contours represent a full build-out of the Airport including the proposed extension of Runway 9L/27R.

6.1 EXISTING NOISE CONDITIONS (2008)

The 2008 DNL contours for OSUA are provided in **Figure 6-1**. As shown in **Figure 6-1**, the 65, 70, and 75 DNL contours are contained completely on Airport property. The 60 DNL contour extends less than one mile beyond the Airport boundaries off of all runway ends. It is important to note that the FAA considers all land used below 65 DNL to be compatible with aircraft noise. Therefore, no mitigation will be possible below 65 DNL. The 60 DNL is being shown to aid in future land use planning decisions for local municipalities and jurisdictions.

The overall shape of the contour is unique and presents a slight bulge to the north of the approach end to Runway 27R. This bulge is due to the primary location of helicopter activity at the Airport. This area serves helicopters for the Ohio Highway Patrol, the Ohio Department of Transportation, and MedFlight.

The overall contour is split due to the distance between the runways and the types of aircraft using each runway. Runway 9L/27R, located to the north, is used primarily for training by the local flight school. Runway 9R/27L is used by the larger aircraft at the Airport including multi-engine piston and corporate jets.

FIGURE 6-1
2008 DNL CONTOURS



6.2 FUTURE NOISE CONDITIONS (2013 AND 2027)

The FAR Part 150 guidelines require two years of analysis - the existing condition (2008 at OSUA) and a condition projected for a future year of at least five years from the date of submittal. As mentioned previously, the future year for OSUA is 2013. In addition to a change in fleet mix and number of operations for 2013, the data used to develop the future year 2013 condition also included the extension of Runway 9L/27R as presented in the Draft Master Plan Update. The 2013 DNL contours are shown on **Figure 6-2**. A review of the 2013 condition indicates that there is an increase in the size of the contours compared to 2008, as well as a change in the shape due to the future runway extension. With the extension to Runway 9L/27R, most corporate jet activity is expected to use the newly extended runway compared to their existing preferred runway of 9R/27L. In addition, the training activity is anticipated to switch to the southern runway, Runway 9R/27L. For 2013, the 65, 70, and 75 DNL contours remain primarily on Airport property.

In addition to the future noise exposure of 2013, DNL contours were developed to show future noise conditions for 2027. These contours are not part of the NEM and are being provided for informational purposes. The 2027 DNL contours are shown on **Figure 6-3**. As with the 2013 DNL contours, the 2027 DNL contours include an updated forecast for the number of operations and fleet mix when compared to the 2013 DNL contours. Also, as is the case for the 2013 DNL contours, the 2027 DNL contours include the runway extension for Runway 9L/27R.

6.3 EXISTING LAND USE AND DEVELOPMENT PATTERNS

A review was made of the land use controls that are currently in effect within political jurisdictions surrounding and including the Airport property. An understanding of the existing methods of land use controls form the basis for evaluating the relationship of the existing and future DNL contours to existing land uses.

6.3.1 Land Use

In 1994, the City of Columbus established the Columbus Airport Environs Overlay District through the adoption of noise contours established at each of the airports within the City of Columbus including the Port Columbus International Airport, Ohio State University Airport, and Bolton Field. The zones were established to ensure compatible land uses were being developed around airports for public safety, health, and welfare, along with protecting airport operations and investments from encroaching non-compatible uses. Columbus City Code Chapter 3384 *Airport Environs Overlay* within Title 33, *Zoning Code*, defines the Airport Environs Overlay (AEO) District and divides the district into three subdistricts based on the noise exposure level. **Table 6-1** outlines the airport overlay zones subdistricts in section 3384.03 of the City Code.

FIGURE 6-2
2013 DNL CONTOURS



FIGURE 6-3
2027 DNL CONTOURS

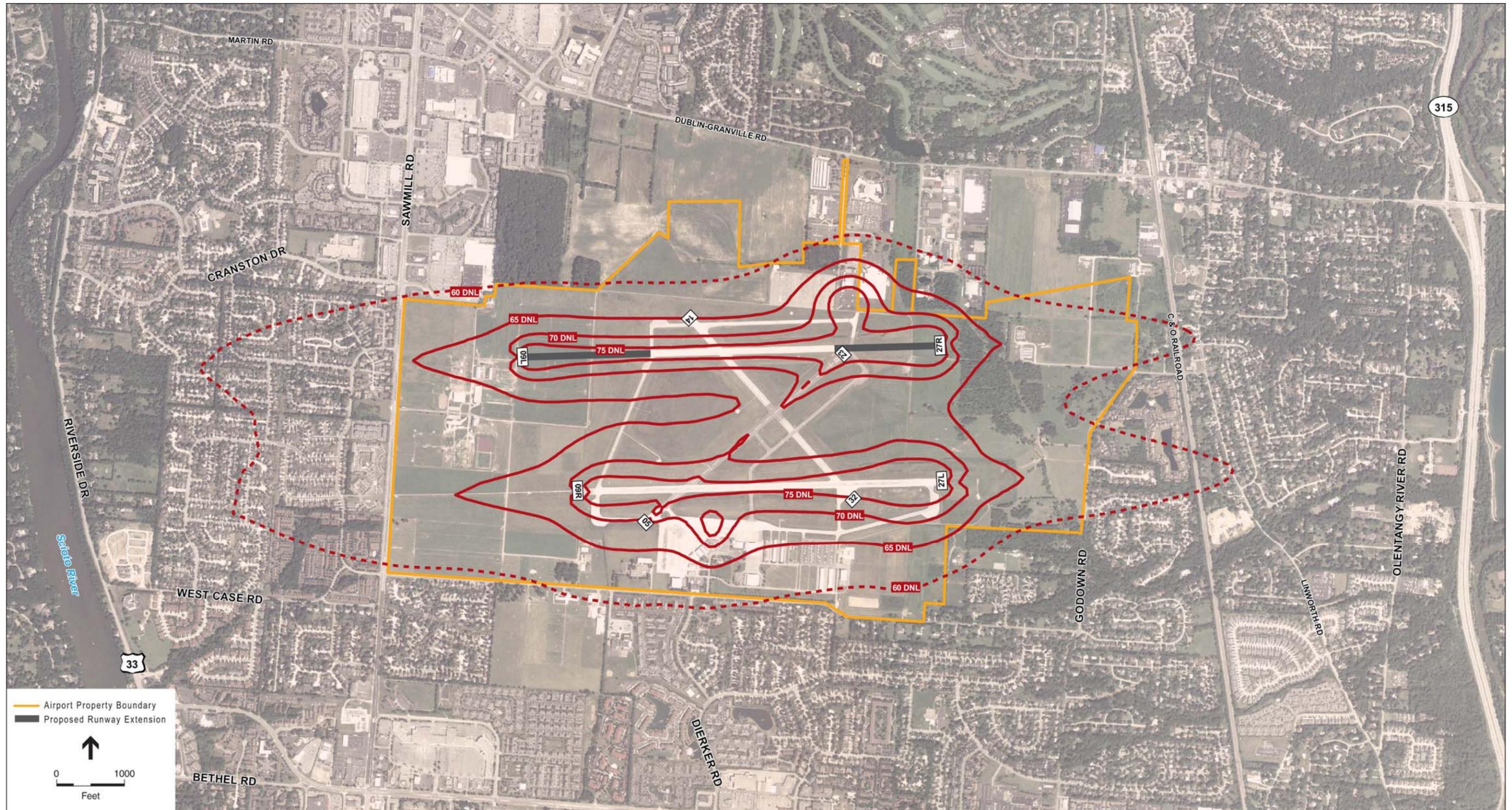


TABLE 6-1
CITY OF COLUMBUS AIRPORT ENVIRONS OVERLAY DISTRICTS

Subdistrict	Definition
A	Area within the 65 Ldn to the 70 Ldn noise exposure area
B	Area within the 70 Ldn to the 75 Ldn noise exposure area
C	Area within the 75 Ldn and greater noise exposure area

Source: City of Columbus
 Note: Ldn and DNL are equivalent.

The subdistrict overlay zones are based on the noise contour maps from each respective airport's FAR Part 150 NCP. The subdistrict overlay zones are expected to be updated when airports update these studies or their noise contours.

According to Table 1: Land Use Compatible Standards (Title 33, Chapter 3384.12), which is shown in **Figure 6-4**, no residential uses are permitted within Subdistricts B and C. In Subdistrict A, residential uses are permitted with the exception of manufactured housing and mobile homes. Airport Staff are designated to review zoning clearance certificate applications per Chapter 3384.10. Development standards have been developed by the City to address interior day-night average noise levels and compliance with noise level reduction standards set forth in Chapter 4191 of the County Code.

Title 41 *Part 1 Building Code*, Chapter 4191 *Airport Environs* of the Columbus City Code describes the standards and criteria set to minimize noise exposure for all areas designated at 65 DNL or greater which includes subdistricts A, B, and C of the AEO Districts. New residential or noise sensitive uses that are proposed within the AEO Districts must meet construction and material criteria set forth in sections 4191.09 through 4191.16. Criteria in this section address general air tightness, exterior walls, windows, doors, roof, ceilings, floors, and ventilation systems. The criteria are applied to any new construction for noise sensitive uses and include reconstruction and remodeling of a structure.

The County Code further addresses development and planning within the AEO Districts within Title 31 *Planning and Platting Code*, Chapter 3123 *Regulations for Land Subdivision*. A plat notice has been recorded for the AEO Districts as a "Noise Warning" which notifies property owners or potential property owners that "this property, either partially or wholly, lies within the noise exposure map area of an airport located in the City of Columbus and is subject to noise that may be objectionable" (Title 31, Chapter 3123.24). Airport Staff are designated to participate in supplemental review of the plat. All subdivision plats must dedicate an avigation easement to OSUA prior to final plat approval. Suggested avigation easement language is included in Chapter 3123.27 of the City Code.

FIGURE 6-4

**TABLE 1: LAND USE COMPATIBILITY STANDARDS
 AEO-AIRPORT ENVIRONS OVERLAY DISTRICT**

LAND USE	Subdistrict A	Subdistrict B	Subdistrict C
	65 DNL	70 DNL	75 DNL
RESIDENTIAL			
Single-, Two-, Three- or Four-Family	Y	N	N
Apartment	Y	N	N
Manufactured Housing, Mobile Homes	N	N	N
Hotels, Motels	Y	Y	N
Church, House of Worship	Y	Y	N
Public Park, Noncommercial Recreation	Y	Y	Y
All Other Residential	Y	Y	N
COMMERCIAL			
Retail	Y	Y	Y
Business Services	Y	Y	Y
Personal Services	Y	Y	N
Professional Services	Y	Y	Y
Offices	Y	Y	N
All Other Commercial	Y	Y	Y
MANUFACTURING			
Manufacturing, Warehousing, Distribution	Y	Y	Y
Parking Facilities	Y	Y	Y
All Other Manufacturing	Y	Y	Y
INSTITUTIONAL			
Hospitals, Nursing Homes	Y	Y	N
Other Medical Facilities	Y	Y	Y
Educational Facilities	Y	Y	N
Public Assembly	Y	Y	N
Government Facilities	Y	Y	Y
All Other Public and Semi-Public	Y	Y	Y
INDUSTRIALIZED UNIT	N	N	N
ALL OTHER USES	Y	Y	Y

Source: City of Columbus

KEY: Y - Land use is permitted. N - Land use is prohibited.

The City of Columbus, being located in Franklin County, has incorporated the AEO Districts on the county level through the Franklin County Zoning Resolution (2004). The Zoning Resolution defines the AEO Districts as Special Districts under Section 7.60. Section 660 Airport Environs (Noise) Overlay District of the Zoning Resolution includes basically the same information found within the

City of Columbus Zoning Code Title 33, Chapter 3384 including the definition of subdistricts A, B, and C, the table of Land Use Compatible Standards, language on development standards, aviation easements, and notice to purchasers requirements. Even though it is an abbreviated version of the City Code section on AEO, the basic information found in the County's Zoning Resolution is consistent with the intent of the City Code.

6.3.2 Zoning

The City of Columbus has the authority to zone property within the City limits. The Airport is in the general zoning district of manufacturing under the classification of M2. OSUA also falls within the Height District H-35. The parcels of land that comprise the Airport also fall within the noise level zones of "Don Scott 75, 70, and 65."

6.3.3 Development Patterns within the Airport Overlay Zone

As noted in this chapter, the City has taken proactive measures to minimize non-compatible land uses within the AEO Districts. Currently the AEO Districts are contained within the Airport property boundaries. According to the City of Columbus Zoning Code, residential uses are permissible in Subdistrict A and limited in Subdistrict B as long as they meet noise reduction construction codes. Beyond the AEO Districts, land uses to the west, east, and south of the Airport are primarily residential which may become a driving force to pressure undeveloped lands surrounding OSUA to become residential or at a minimum, be compatible with residential uses.

6.3.4 Airport Land Use in Relation to Land Use Documents

Table 6-2 lists the land use documents that were reviewed to determine if elements or components of the documents referenced OSUA and future planning efforts.

OSUA current and future land use for OSUA property at the Airport and the surrounding areas are discussed in the draft version of The Northwest Plan (September, 2007) prepared by the City of Columbus, Department of Development, Planning Division. The Plan specifically identifies two targeted infill areas south of OSUA on West Case Road. Recommendations for these areas include supporting new development of both residential and non-aviation uses that are compatible to both the Airport and surrounding, existing residential areas. Development considerations highlight the need for any development in the area to "maintain a clear flight path to OSU Airport Runway 5." Another element of the plan that deals directly with land uses on or near the Airport property is the recommendation for the creation of a multi-use path around the perimeter of the OSU airport and OSU-owned land.

TABLE 6-2
LOCAL JURISDICTIONS DOCUMENTS RELATED TO AIRCRAFT NOISE

Local Jurisdiction	Title of the Document	Document Date	Noise related issues
City of Columbus	The Northwest Plan (draft)	9/2007	Yes
City of Dublin	City of Dublin Community Plan (draft)	2007	No
City of Worthington	Comprehensive Plan Update & 2005 Strategic Plan for Worthington	2005	Yes
City of Upper Arlington	Master Plan for the City of Upper Arlington	2001	No

Source: ESA Airports

The City of Worthington is located northeast of OSUA and currently does not fall within the AEO Districts. However, their land use document, City of Worthington, Ohio Comprehensive Plan Update & 2005 Strategic Plan for Worthington (adopted December 5, 2005) addresses noise issues related to aircraft operations at OSUA. Within the recommendations section of the document, the plan calls for the City to address existing noise issues by implementing a noise complaint program and the recognition of a grassroots organization called WOOSE intended to "...study this issue and oppose any airport expansion" (Worthington, 2005). The City recommends that support of any expansion to the Airport facility would be contingent on reviewing the results of ongoing and future environmental and noise studies.

6.4 AIRCRAFT NOISE-RELATED LAND USE IMPACTS

The FAA has developed land use guidelines that relate the compatibility of aircraft activity to areas surrounding an Airport. These guidelines, provided in **Figure 6-5**, identify land use activities that are acceptable within the 65, 70 and 75 DNL contours. FAA guidance indicates that virtually all land uses below the 65 DNL are considered to be compatible with the effects of aircraft noise and therefore will not fund mitigation programs below 65 DNL. It is important to note that the FAA does allow local land use planning agencies to adopt a lower compatibility level that may be more stringent than FAA guidelines.

Attention is focused on areas within the 65 DNL because the FAA considers aircraft noise exposure levels of 65 DNL and greater to be incompatible with noise sensitive uses. The 65 DNL contour also identifies the limits the FAA considers the most crucial for eligibility of funding of noise abatement measures. The 65 DNL contour was chosen by the FAA to represent the point of compatibility versus non-compatibility based on two factors: the Schultz Curve and being able to fund noise mitigation programs within a reasonable level. When developing FAR Part 150 regulations, the FAA had to strike a balance between aircraft noise levels where annoyance was minimal and the ability of the federal government to provide funding for noise mitigation programs within a defined area around each airport in the country. The Schultz Curve is based on scientific analysis of noise levels and people’s associated annoyance level. The funding factor related to the

**FIGURE 6-5
FAR PART 150 STUDY GUIDELINES**

Land Use	Yearly Day-Night Noise Level (DNL) in decibels					
	Below 65	65-70	70-75	75-80	80-85	Over 85
Residential						
Residential, other than mobile homes and transient lodgings	Y	N(1)	N(1)	N	N	N
Mobile home parks	Y	N	N	N	N	N
Transient lodgings	Y	N(1)	N(1)	N(1)	N	N
Public Use						
Schools	Y	N(1)1	N(1)	N	N	N
Hospitals and nursing homes	Y	25	30	N	N	N
Churches, auditoriums and concert halls	Y	25	30	N	N	N
Governmental services	Y	Y	25	30	N	N
Transportation	Y	Y	Y(2)	Y(3)	Y(4)	Y(4)
Parking	Y	Y	Y(2)	Y(3)	Y(4)	N
Commercial Use						
Offices, business and professional	Y	Y	25	30	N	N
Wholesale and retail-building materials, hardware and farm equipment	Y	Y	Y(2)	Y(3)	Y(4)	N
Retail trade-general	Y	Y	25	30	N	N
Utilities	Y	Y	Y(2)	Y(3)	Y(4)	N
Communication	Y	Y	25	30	N	N
Manufacturing and Production						
Manufacturing, general	Y	Y	Y(2)	Y(3)	Y(4)	N
Photographic and optical	Y	Y	25	30	N	N
Agriculture (except livestock) and forestry	Y	Y(6)	Y(7)	Y(8)	Y(8)	Y(8)
Livestock farming and breeding	Y	Y(6)	Y(7)	N	N	N
Mining and fishing resource production and extraction	Y	Y	Y	Y	Y	Y
Recreational						
Outdoor sports arenas and spectator sports	Y	Y(5)	Y(5)	N	N	N
Outdoor music shells, amphitheaters	Y	N	N	N	N	N
Nature exhibits and zoos	Y	Y	N	N	N	N
Amusements, parks, resorts and camps	Y	Y	Y	N	N	N
Golf courses, riding stables and water recreation	Y	Y	25	30	N	N

Numbers in parentheses refer to notes.

* The designations contained in this table do not constitute a Federal determination that any use of land covered by the program is acceptable or unacceptable under Federal, State or local law. The responsibility for determining the acceptable and permissible land uses and the relationship between specific properties and specific noise contours rests with the local authorities. FAA determinations under Part 150 are not intended to substitute federally determined land uses for those determined to be appropriate by local authorities in response to locally determined needs and values in achieving noise compatible land uses.

Key to Table 1

SLUCM Standard Land Use Coding Manual.
Y(Yes) Land Use and related structures compatible without restrictions.
N(No) Land Use and related structures are not compatible and should be prohibited.
NLR Noise Level Reduction (outdoor to indoor) to be achieved through incorporation of noise attenuation into the design and construction of the structure.
25, 30 or 35 Land Use and related structures generally compatible; measures to achieve NLR of 25, 30 or 35 dB must be incorporated into design and construction of structure.

Notes

- (1) Where the community determines that residential or school uses must be allowed, measures to achieve outdoor to indoor Noise Level Reduction (NLR) of at least 25 dB to 30 dB should be incorporated into building codes and be considered in individual approvals. Normal residential construction can be expected to provide a NLR of 20 dB, thus, the reduction requirements are often stated as 5, 10 or 15 dB over standard construction and normally assume mechanical ventilation and closed windows year round. However, the use of NLR criteria will not eliminate outdoor noise problems.
- (2) Measures to achieve NLR of 25 dB must be incorporated into the design and construction of portions of these buildings where the public is received, office areas, noise sensitive areas or where the normal noise level is low.
- (3) Measures to achieve NLR of 30 dB must be incorporated into the design and construction of portions of these buildings where the public is received, office areas, noise sensitive areas or where the normal noise level is low.
- (4) Measures to achieve NLR of 35 dB must be incorporated into the design and construction of portions of these buildings where the public is received, office areas, noise sensitive areas or where the normal noise level is low.
- (5) Land use compatible provided that special sound reinforcement systems are installed.
- (6) Residential buildings require an NLR of 25.
- (7) Residential buildings require an NLR of 30.
- (8) Residential buildings not permitted.

thousands of homes and noise sensitive sites across the country that would potentially be mitigated using federal funds. The balance was reached by selecting the 65 DNL.

Based on the Schultz Curve, approximately 14% of people are “highly annoyed” at 65 DNL. The 65 DNL contour provided a boundary where the annoyance level was reasonably low and the potential noise sensitive locations located within that contour level across the country was at a manageable level from a federal funding viewpoint.

The FAA recognizes, however, that noise does not stop at 65 DNL and is heard by people located in close proximity to approach, departure, and training corridors. The Airport sponsor can address noise concerns with possible modifications to flight procedures that are beyond the limits of the 65 DNL. These programs are evaluated in the noise compatibility portions of this Study.

6.4.1 Existing Land Use

Figures 6-1 and **6-2**, presented previously in this section, show the DNL contours for the 2008 and 2013 conditions respectively. The base map, for both **Figures 6-1** and **6-2**, uses recent aerial photography that depicts the existing land uses in the vicinity of OSUA. As can be seen, densely developed residential land use occurs to the east, south, and west of the Airport. The residential land use in these areas consists of both single family and multi-family residences. To the immediate north of the Airport is commercial land use, with single-family residential beyond that. The area around the Airport is mature from a development standpoint with little vacant space available for future non-compatible land use development.

6.4.2 DNL Contour Relationships to Existing Land Use Maps

Figure 6-6 shows the 2008 DNL contours over an existing land use base. The land use base was compiled from mapping provided by the Mid-Ohio Regional Planning Commission (MORPC). It should be noted that **Figure 6-6** is a generalized map showing the predominant land uses within the study area and is not intended to represent land uses at the parcel level of detail.

With the exception of a small area of the 65 DNL contour near the approach end of Runway 27L, **Figure 6-6** indicates that the 65 DNL, 70 DNL, and 75 DNL contours are contained entirely on Airport property. The 60 DNL contour, which is provided for informational purposes, extends beyond the Airport property boundary and encompasses pockets of primarily single-family and multi-family residential land uses. The FAA considers aircraft noise exposure levels of 60 DNL to be compatible with residential uses.

6.4.3 DNL Contour Relationships to Future Land Use Maps

Figure 6-7 shows the 2013 DNL contours over a future land use base. The land use base was compiled from mapping provided by MORPC. It should be noted that **Figure 6-7** is a generalized map showing the predominant land uses within the study area and is not intended to represent land uses at the parcel level of detail.

Figure 6-7 indicates that the 65 DNL, 70 DNL, and 75 DNL contours are primarily on Airport property. A small portion of the 65 DNL contour near the approach end of Runway 27L goes slightly beyond the Airport property boundary. The 60 DNL contour extends beyond the Airport property boundary and encompasses pockets of primarily single-family and multi-family residential

FIGURE 6-6
2008 DNL CONTOURS OVER EXISTING LAND USE

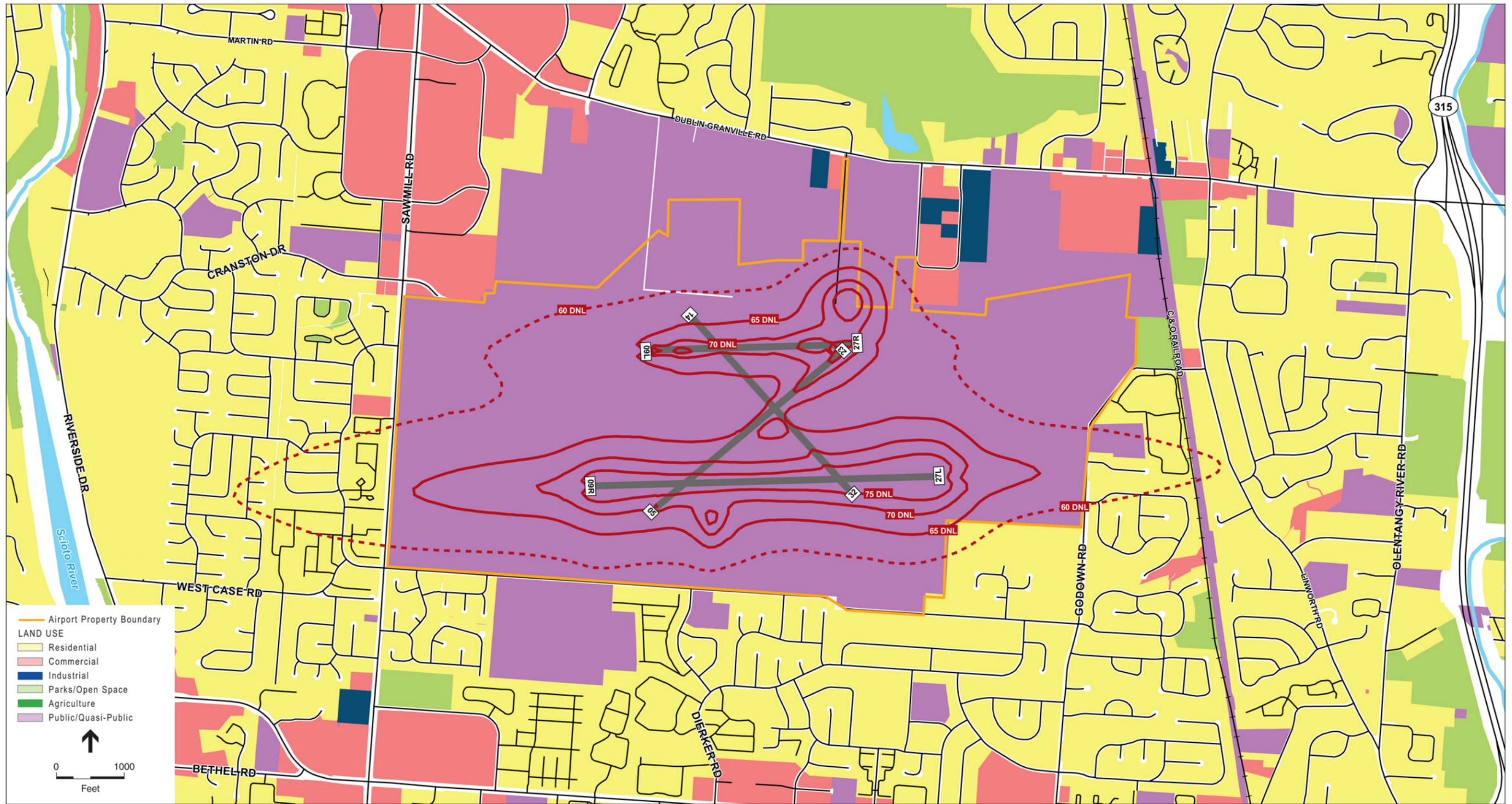
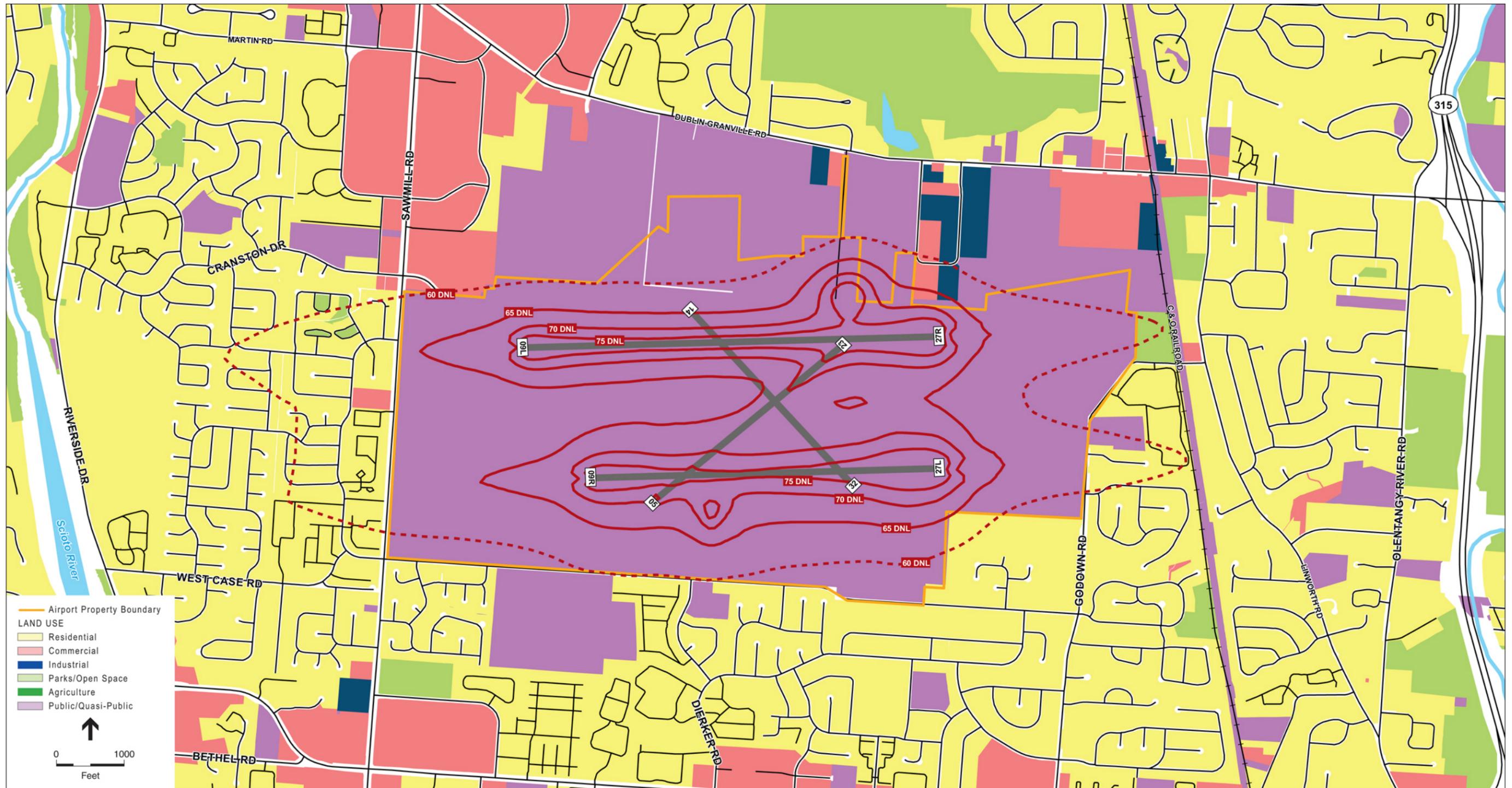


FIGURE 6-7
2013 DNL CONTOURS OVER FUTURE LAND USE



land uses to the east and west of the Airport. The FAA considers aircraft noise exposure levels of 60 DNL to be compatible with residential uses.

6.4.4 Existing Population Within DNL Contour Areas

Figure 6-8 presents a depiction of the population density around the Airport based on 2007 census data estimates. Population within various DNL contour ranges was estimated through use of this census data and review of aerial photography.

Figure 6-1, presented previously in this section, shows homes located in the general vicinity of the 2008 DNL contours. A review of **Figure 6-1** indicates that there are no housing units within the 65 DNL and higher contours. To determine the estimated population within the 60 DNL contour, the population density for the census blocks affected by the 60 DNL contour were multiplied by the total square miles that the 60 DNL contour covered. Within the 2008 60 DNL contour, there were estimated to be 201 housing units and an estimated population of 1,089 people. This information is being provided for land use planning purposes only. The FAA considers residential land uses to be compatible with contours of 64 DNL and lower. As shown in **Figure 6-2**, presented previously in this section, by 2013 the DNL contours are projected to increase in size. No housing units are located within the 65 DNL contour and higher for 2013. Within the 60 DNL contour, there were estimated to be 381 housing units and an estimated population of 1,959 people. **Table 6-3** and **Table 6-4** provide a summary of the housing units and population located within the existing and future contours.

TABLE 6-3
2008 DNL CONTOUR POPULATION SUMMARY

Contour Range	Housing Units	Population
60-64 DNL	201	1,089
65-69 DNL	0	0
70-74 DNL	0	0
75+ DNL	0	0

TABLE 6-4
2013 DNL CONTOUR POPULATION SUMMARY

Contour Range	Housing Units	Population
60-64 DNL	381	1,959
65-69 DNL	0	0
70-74 DNL	0	0
75+ DNL	0	0

6.5 NOISE SENSITIVE SITES

The FAA defines noise sensitive sites as uses within the 65 DNL contour that would be incompatible with aircraft noise. In addition to residential, such sites would include schools, places of worship, hospitals, passive parks and other uses that could be adversely affected by aircraft noise. **Figures 6-9** and **6-10** depict the noise sensitive uses, other than residential, on a map showing the 65 DNL and higher contours for 2008 and 2013, respectively. Both figures indicate that there are no noise sensitive land uses within the 65 DNL and higher contours.

FIGURE 6-8
POPULATION DENSITY IN AIRPORT ENVIRONS

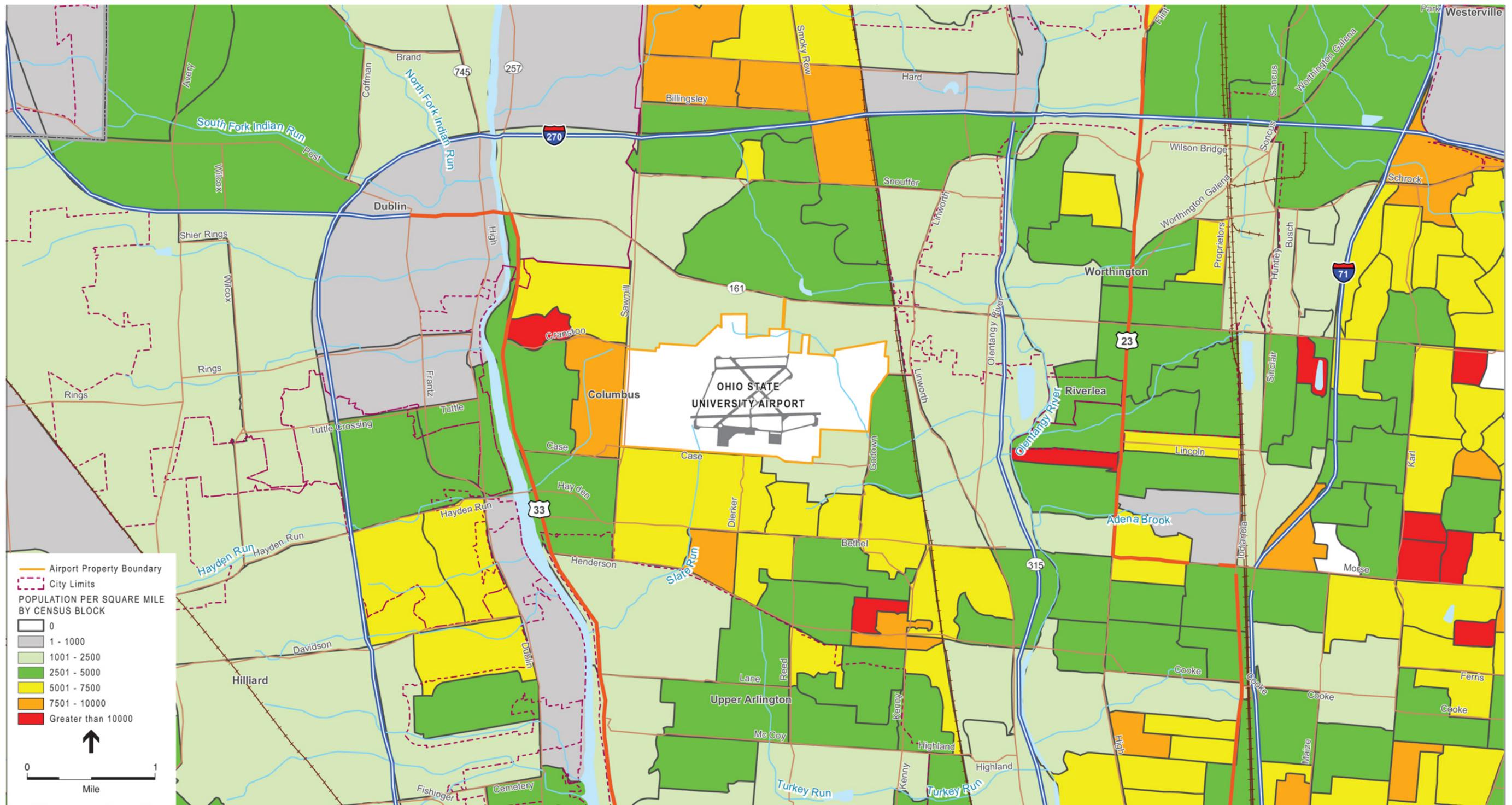


FIGURE 6-9
NOISE SENSITIVE SITES WITHIN THE EXISTING (2008) DNL CONTOURS

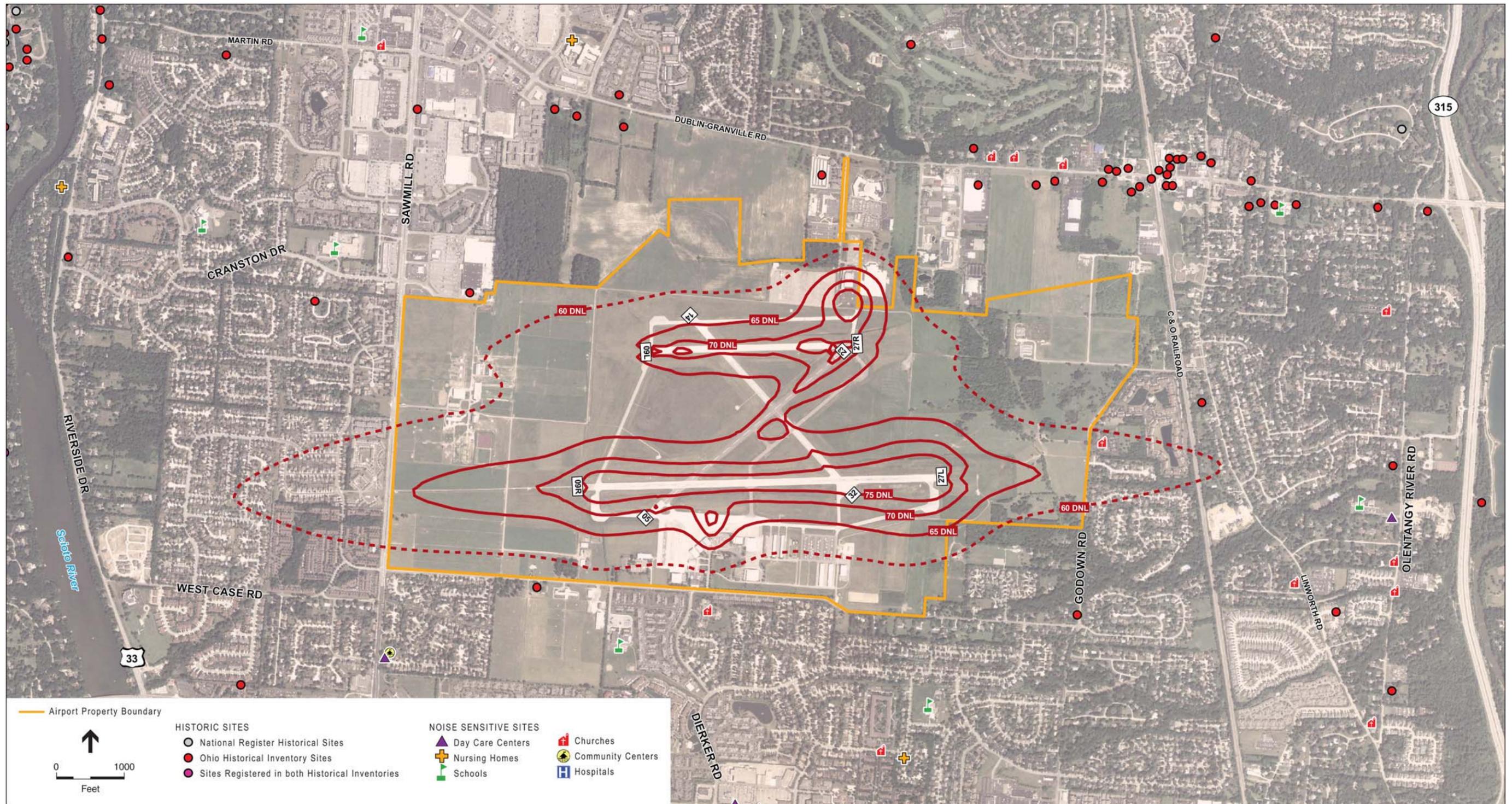


FIGURE 6-10
NOISE SENSITIVE SITES WITHIN THE FUTURE (2013) DNL CONTOURS

