

# **APPENDIX F**

## **GEOGRAPHIC INFORMATION SYSTEM DATABASE DEVELOPMENT AND LAND USE METHODOLOGY**

Identifying and evaluating land uses within the airport environs is an important step in the Environmental Impact Statement (EIS) process. This evaluation is necessary to identify existing and planned land uses around the Port Columbus International Airport (CMH or Airport). The land use assessment includes examining land use classifications and zoning patterns, surveying and mapping, local assessments of sound insulation requirements, capital improvement programs, growth risk assessment, and airport environs land use compatibility plans; applying the Federal Aviation Administration (FAA) 14 CFR Part 150 (Part 150) guidelines for land use compatibility, and policies on acquisition, easements, and disclosures; and airport overlay districts. A Geographic Information System (GIS) land use database was also developed to facilitate the identification of land uses that are incompatible with airport operations.

### **F.1 AIRPORT ENVIRONS**

The Airport environs (see Chapter Four, *Affected Environment*) refers to the regional area that may experience the broader effects from the noise of aircraft overflight, as well as social or socioeconomic impacts of the Sponsor's Proposed Project. Consequently, the boundary of the Airport environs was formed by assessing both the location of flight tracks and the general area in which the Sponsor's Proposed Project would have broad effects upon the community. It is in this area that a general analysis of the effects of the Airport was performed. The General Study Area (GSA) was delineated by assessing both the location of flight tracks and the general area where noise levels would exceed 60 Day-Night Average Sound Level (DNL). It is within the GSA that a more detailed analysis of land use and noise compatibility was performed and future land use mitigation measures were considered.

#### **F.1.1 LAND USE MAPPING**

Maps are used to identify existing land use conditions within the GSA compared to areas impacted by noise, thereby enabling decisions to be made that will eliminate or minimize noise impacts upon noise sensitive land uses. This section describes the methodology for collecting and analyzing land use data.

#### **F.1.2 LAND USE CLASSIFICATIONS**

Existing land use data was collected from the counties, municipalities, and townships within the GSA, as well as from reports generated by the Mid-Ohio Regional Planning Commission (MORPC). Land uses in the vicinity of the Airport were categorized in terms of the general land use classifications presented in Part 150, which include residential (single and multi-family), commercial,

public/institutional, and agricultural/recreational/open space. These land uses were identified based on Franklin County's GIS database, previous Part 150 studies, additional land use surveys provided by the Columbus Regional Airport Authority (CRAA) or local jurisdictions, and was supplemented as necessary by field verification. **Table F-1** shows the generalized land use categories and examples of specific land uses that would be grouped into these general land use categories. The existing land use pattern within the Airport environs is shown in Exhibit 4-5, *Existing Land Use* in Chapter Four, *Affected Environment*.

**Table F-1  
GENERALIZED LAND USE CLASSIFICATIONS  
Port Columbus International Airport**

GENERALIZED LAND USE CATEGORY	SPECIFIC LAND USE EXAMPLES
Single-Family Residential	Single-Family Homes
Multi-Family Residential	Multi-Family Homes Apartments
Mobile Home Park	Mobile Home Parks
Commercial / Industrial	Manufacturing Warehousing Mining / Quarry / Excavating Food Service Gas Stations Retail
Public / Institutional	Schools Libraries Churches Hospitals Government Buildings
Open Space	Agricultural / Farming / Nurseries Wooded Parks / Recreation
Exempt/Unclassified	Transportation Facilities Public Utilities Parking

Source: Landrum & Brown, 2007.

### **F.1.2.1 Land Use Data Compilation**

Base mapping information, including roads, county and municipal boundaries, and land use were compiled using ArcMap, version 9.2. ArcMap is an analytical software program that allows manipulation and analysis of spatial data from a variety of sources. Digital road files were obtained from the Franklin County GIS database.

The 2000 U.S. Census data, at the block level, was combined with the GIS land use file to calculate the population and housing incompatibilities within the noise contours. Census data was augmented via field checking to arrive at final housing counts within the GSA and household locations were mapped in a GIS layer file. An estimated ratio of persons per household was determined based using census data and that ratio was applied to each dwelling unit. The housing and population incompatibilities within each of the noise contours were determined by overlaying the noise contour layer with the GIS land use and housing structure layers. The number of residential structures and population within each DNL noise contour level was then determined by an automated count.

#### **F.1.2.2 Noise-Sensitive Public Facilities**

Noise-sensitive public facilities include schools, churches, libraries, hospitals, and nursing homes. The number and location of noise-sensitive public facilities within the airport environs were derived from a number of different sources. Schools, libraries, hospital, nursing homes and churches initially were extracted from the Franklin County Auditor Data. These facilities were then field-checked to verify their locations. Chapter Five, *Environmental Consequences*, Section 5.2, *Compatible Land Use* lists the noise-sensitive public facilities in Table 5.2-2 and graphically depicts their locations on Exhibit 5.2-2, *Existing Noise-Sensitive Public Facilities*.

#### **F.1.2.3 Existing Historic Sites**

Sites of historic significance near CMH are identified through the National Register of Historic Places. "The National Register of Historic Places (NRHP) is the official list of properties recognized by the federal government as worthy of preservation for their local, state, or national significance in American history, architecture, archaeology, engineering, or culture. Although the National Register is a program of the National Park Service, it is administered at the state level by each respective state. In Ohio, the National Register program is administered by the Ohio Historic Preservation Office." A listing of sites in Ohio that are included in the NRHP is accessible online at: <http://dbs.ohiohistory.org/hp/index.cfm>. Historic sites within the GSA are listed in Table 5.8-1 and shown on Exhibit 5.8-3 in Chapter Five, *Environmental Consequences*, Section 5.8, *Historic, Architectural, Archeological, and Cultural Resources*.

#### **F.2.2 PREVENTATIVE LOCAL LAND USE CONTROLS**

The following provides a brief discussion of the types of preventative land use controls available to the local jurisdictions to assist in reducing non-compatible land uses. Ultimately, it is the responsibility of the local jurisdictions to implement these land use controls. However, the CRAA is a willing partner in that effort and continually reaches out to the local jurisdictions to provide assistance.

### **F.2.2.1 Zoning**

Zoning is one of the primary tools available to local communities to ensure land use compatibility. Zoning ordinances and regulations are intended to promote public health, safety, and welfare by regulating the use of the land within a jurisdiction based on factors such as land use compatibility and existing and expected socioeconomic conditions.

### **F.2.2.2 Subdivision Regulations**

Subdivision regulations apply in cases where a parcel of land is proposed to be divided into lots or tracts. They are established to ensure the proper arrangement of streets, adequate and convenient open space, efficient movement of traffic, avoidance of congestion, sufficient and properly-located utilities, access for fire-fighting and rescue vehicles, and the orderly and efficient layout and use of land.

Subdivision regulations can be used to enhance noise-compatible land development by requiring developers to plat and develop land so as to minimize noise impacts or reduce the noise sensitivity of new development. The regulations can also be used to protect the airport proprietor from litigation for noise impacts at a later date. The most common requirement is the dedication of a noise or aviation easement to the local government by the land subdivider as a condition of development approval. The easement authorizes overflights of the property, with the noise levels attendant to such operations. This information is then attached to the property's plat notice.

### **F.2.2.3 Building Codes**

Building codes regulate the construction of buildings, ensuring that they are built to safe standards. Sound insulation may be required in new homes, offices, and institutional buildings to mitigate the effects of high aircraft noise levels. Building code requirements intended for energy efficiency also provide acoustical insulation benefits. Caulking of joints, continuous sheathing, dead air spaces, ceiling and wall insulation, solid core doors, and double-pane windows can attenuate aircraft noise while conserving energy used for home heating and cooling.

Not all sound insulation needs are met by typical energy-conserving building methods. For example, field research has found that some modern and highly energy-efficient storm window designs are less efficient for sound insulation than some older designs that allow for larger dead air spaces. Other sound insulation measures that may not be justifiable for energy efficiency are vent baffling and year-round, closed-window ventilation systems.

Building codes apply to existing buildings only when remodeling or expansion is contemplated. Amendments to building codes do not help to correct noise problems in developed areas. In developed areas, sound insulation must be applied retroactively to existing structures.

#### **F.2.2.4 Capital Improvements Programs**

Capital improvements programs are multi-year plans, typically covering five or six years, which list major capital improvements planned to be undertaken during each year. Most capital improvements have no direct bearing on noise compatibility; few municipal capital improvements are noise-sensitive. The obvious exceptions to this are schools and, in certain circumstances, libraries, medical facilities, and cultural/recreational facilities.

Some capital improvements may have an indirect, but more profound, relationship to noise compatibility, however. For instance, sewer and water facilities may open up large vacant areas for private development of noise-sensitive residential uses. In contrast, the same types of facilities, sized for industrial users, could enable industrial development in a noise-impacted area that might otherwise be attractive for residential development.

#### **F.2.2.5 Growth Risk Assessment**

Before evaluating the impact of aircraft noise within the airport environs, it is important to understand the likelihood for the future development of residential and other noise-sensitive land uses, especially in the planning time frame. Understanding development trends in the airport vicinity is of critical importance in noise compatibility planning, because future residential growth can potentially result in new incompatible land uses if that growth occurs beneath aircraft flight tracks and within areas subject to high noise levels.

The growth risk analysis focuses primarily on undeveloped land which is planned and zoned for residential use. It is recognized that additional development may occur through in-filling and redevelopment of currently developed areas.

The methodology for analyzing potential growth risk is as follows:

- Identify all vacant, unplatted tracts of land zoned for future residential development with the greatest potential for being developed within the next five years.
- Calculate the area of the tracts; apply a factor accounting for development inefficiencies and the platting of streets; multiply by dwelling unit densities specified in the zoning ordinance; and multiply by household size to obtain the population holding capacity of presently vacant, unplatted land.
- Sum the above population holding levels to determine the total population holding capacity of the study area.

The final step in the growth risk analysis is to estimate whether the development is likely to occur before or after the year for which future noise exposure has been calculated. This tends to be quite speculative and should be regarded only as a general indicator of the potential risk of increases in land use incompatibility.

### **F.2.3 CORRECTIVE LAND USE MITIGATION ALTERNATIVES**

The following is a brief discussion of typical corrective or remedial land use mitigation alternatives included in Part 150 and EIS studies.

#### **F.2.3.1 Sound Insulation of Homes**

A program for sound insulation of residences is always voluntary on part of the homeowner and is generally focused on residences located in a 65 DNL to 70 DNL noise contour. Other than the obvious benefit of reducing interior noise levels, a sound insulation program maintains the land use of the area and generally increases the value of the properties. Unfortunately, sound insulation treatments do not reduce the noise outside the residence and as such the benefits of the treatments are reduced when doors and windows are open.

#### **F.2.3.2 Acquisition of Land or Interests in Land**

A program for property acquisition can be either voluntary (participation in the program is voluntary on the part of the property owner), or involve condemnation (local power of eminent domain). Acquisition as mitigation for noise impacts would always be voluntary, where acquisition for development purposes may involve condemnation if a purchase agreement can not be negotiated.

##### Land Acquisition to Change Land Use

If the acquisition of property results in a change in land use, from incompatible to compatible with airport operations (e.g., airport/transportation, commercial, or industrial), the property owner would be eligible for relocation assistance and moving expenses, consistent with the *Uniform Relocation Assistance and Real Property Acquisition Policies Act*. The property would be acquired, residents would be relocated, and the property would be converted to a compatible land use. This would prevent further development of incompatible land uses. The land acquisition program should assure that the subsequent land use is consistent with local land use plans and policies, including compatibility with noise exposure levels in the area. Because the acquisition is to result in a change in land use, the local jurisdiction may decide to apply its power of eminent domain.

##### Land Acquisition without Change to Land Use

The acquisition of incompatible property where no change in land use would result would be a "voluntary" acquisition program, where participation in the program would be voluntary on the part of the property owner. The reason for such a voluntary program is most often due to the owner's inability to sell the property at fair market value. Acquisition procedures would be implemented in accordance with the *Uniform Relocation Assistance and Real Property Acquisition Policies Act* and relocation benefits would not apply.

### **F.2.3.3 Purchase Guarantee**

Purchase guarantee is a program whereby the airport sponsor agrees to purchase a residence for fair market value should the owner be unable to sell the property on the open market because of noise impacts. Participation in this program is voluntary on the part of the property owner and is implemented in areas where the land use is not going to change. In order to protect potential buyers a stipulation of this program requires that the seller disclose to the buyer the airport noise exposure on the property and the intention of the airport sponsor to retain an easement on the property. Acquisition procedures would be implemented in accordance with the *Uniform Relocation Assistance and Real Property Acquisition Policies Act* and relocation benefits would not apply.

### **F.2.3.4 Avigation Easements**

Acquisition of avigation easements should be used to alleviate conflicts if no other land use controls are viable or in some cases, in lieu of outright acquisition of the land. The easement would be noted on the property deed and passed on to any subsequent owners of the property.

Amending local zoning and subdivision regulations to provide for the dedication of an easement to the airport sponsor as a condition of approval for residential rezoning or subdivision plats within the 65 DNL noise contour would alert developers, lenders, and prospective purchasers to the proximity of the airport and to the existence of a potential noise issue. The avigation easement would also protect the airport from future litigation by purchasers of the rezoned or subdivided property.

There is a constitutional issue raised by requiring dedication of an easement as well as imposing more vigorous and expensive standards for construction within the airport environs. Government may not require a person to give up a constitutional right (i.e., a public use) in exchange for a discretionary benefit conferred by the government unless there is a reasonable relationship between a legitimate governmental objective and the condition that is imposed on the developer. Moreover, the exaction demanded by the permit or condition must be in proportion to the impact of the proposed development that is sought to be alleviated. Whether that balance exists requires an individualized determination. If it were determined not to meet these standards, then the legislation would either be unenforceable or its enforcement would constitute a taking requiring the payment of just compensation.

### **F.2.3.5 Fair Disclosure Policy**

A method can be developed insuring that buyers of residential property within the airport environs receive fair disclosure of the location of the property relative to the airport by requiring that sellers of residential property in the airport environs deliver to buyers a purchase disclosure notice consisting of a copy of the Noise Overlay District Ordinance and Map with a statement that the property is located within the Airport Noise Overlay District. It may also require that all advertisements and listings for sale of residentially zoned or improved property in the Noise Overlay

District include a statement about aircraft noise, such as -- "Not recommended for persons who may be easily disturbed by aircraft noise." Finally, solicitation of voluntary inclusion of the notice in Multiple Listing Services by the real estate profession alerts potential buyers of property to the noise conditions.

### **F.3 FAA LAND USE PLANNING INITIATIVES**

In 1999, the FAA announced a package of land-use planning initiatives designed to reduce problems with aviation noise around airports. Those initiatives are based on responses from local communities, aviation interests, and environmental groups. Of particular concern is the loss of noise reductions through the phase out of Stage 2 aircraft by permitting new noise-sensitive uses in areas where the noise contours are shrinking as a result of the phase out.

The purpose of the initiatives is to enable communities and airports to work together to manage the land use areas to be economically productive and protective of the airport's futures. The five packages include communication improvements for conveying FAA noise policies and noise compatibility information to communities near airports and state aviation organizations.

The FAA also issued a notice of final policy in October 1998 regarding Part 150 approval of noise mitigation measures and the effect on the use of Federal grants for noise mitigation projects. The final policy provides new limitation on the use Airport Improvement Program (AIP) funds for corrective/remedial noise mitigation projects.