

Pennsylvania Airport Land Use Compatibility Guidelines

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Prepared by

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INTRODUCTION

Pennsylvania's air transportation system is vital to the Commonwealth's ability to maintain an effective network of interstate commerce. The airports themselves are also major centers of employment within the Commonwealth. Jobs associated with on-airport aviation-related tenants and with visitors who arrive in Pennsylvania via both commercial and general aviation aircraft total over 228,900. Many employers in the Commonwealth beyond the airport boundaries rely on the airports to allow them to conduct business on a daily basis. It is estimated that there are over 496,000 additional jobs in Pennsylvania that are in some way tied to the operation of the airport system.

Many businesses seek development opportunities on airports and in the airport environs. The Pennsylvania Department of Transportation Bureau of Aviation has cataloged development opportunities for 85 airports in the Commonwealth that have paved runways of 2,500 feet or greater. Most types of commercial and industrial development are highly compatible with airport operations, and many commercial activities actually benefit from being in proximity to the airport.

Unfortunately, many prime development areas in the airport environs are actually being lost to development which ultimately is not compatible with the Commonwealth's airports, their operations, and/or their potential expansion needs. In general, land uses which are noise sensitive or that lead to large congregations of people in the airports' operational envelope prove to be less than ideal. Incompatible land use can threaten the long-term viability of an airport. It can also result in lost economic development opportunities.

Pennsylvania's airport system must be protected as both an important transportation and an important economic resource. To achieve this objective, the Pennsylvania Department of Transportation Bureau of Aviation has developed guidelines aimed specifically at identifying land uses and activities that are considered compatible around an airport. These Land Use Compatibility Guidelines are presented in this document.

Information provided in this document can be used by the municipalities, counties and airports through the Commonwealth to strengthen the long-term viability of the airport system. The Pennsylvania Department of Transportation Bureau of Aviation highly recommends the adoption of the guidelines presented in this document by all impacted municipalities. While recommendations contained in these Guidelines are often related to standards published

by the Federal Aviation Administration (FAA), it should be noted that these Land Use Compatibility guidelines are not FAA mandated; they are specific to the Commonwealth of Pennsylvania. Appendix A to this document provides a reference for determining which municipalities are responsible for compatible land use actions within the environs of each Pennsylvania airport. By taking steps to adopt the Guidelines outlined in this document, each affected party will be taking a significant step toward protecting both their transportation and their economic resources for the future.

Further information on compatible activities in the airport environs can be obtained from the following:

The Pennsylvania Department of Transportation
Bureau of Aviation (717) 705-1260

The Federal Aviation Administration
Harrisburg Airports District Office
(717) 730-2830

WHAT IS THE FOCUS OF THIS DOCUMENT?

Safety is of paramount concern when considering the operation of an airport. Safety relates not only to pilots and aircraft, but also to persons and property in each airport's environs. In 1984, the Pennsylvania legislature passed ACT 164, Pennsylvania Laws Relating to Aviation of which Chapter 59, Subchapter B, is entitled the "Airport Zoning Act." The Airport Zoning Act states as its general rule:

"In order to prevent the creating or establishment of airports hazards, every municipality having an airport hazard area within its territorial limits shall adopt, administer and enforce, under the police power and in the manner and upon the conditions prescribed in this subchapter and in applicable zoning laws unless clearly inconsistent with this subchapter, airport zoning regulations for such airport hazard area"¹

Act 164 places the responsibility of enacting airport zoning ordinances with the municipality in which the hazard area occurs. "Airport hazard areas, as described in Act 164, are based on Federal Aviation Regulation (FAR), Part 77. Part

¹ It is important to note that the FAA and the Commonwealth define "hazard" differently. Hazard, as used in this document, reflects the Commonwealth definition.

77 provides a mechanism whereby FAA evaluates objects to determine if they are hazards to air navigation. Part 77 establishes thresholds (imaginary surfaces and others) above which notification to the FAA of proposed construction and existing objects is required. While Part 77 will be more fully described within subsequent portions of this document, all Pennsylvania municipalities falling within the outermost reaches of an airport's Part 77 surfaces (defined by the conical surface) are defined as being in the airport hazard area. Hence, these municipalities are subject to Act 164 compliance to regulate the height of objects around airports in accordance with guidelines established in FAR Part 77.

To encourage municipalities to comply with Airport Hazard Zoning, PennDOT participated in several positive, informative-type exercises which included:

- * July, 1983 - all County Commissioners were advised of the airport zoning law by correspondence sent by the Department. Enclosed with that letter was a copy of the FAA Advisory Circular containing a model airport zoning ordinance.
- * 1984 - Communications regarding Airport hazard Zoning was exchanged with the Pennsylvania State Association of County commissioners.
- * 1985 - PennDOT worked with the Department of Community Affairs, Bureau of Community Planning, in contacting all planning agencies in the Commonwealth to advise them of the airport zoning law.
- * 1986 - Airport Hazard Zoning was a conference agenda item at the Pennsylvania Aviation Conference.
- * Post-1986 - PennDOT met with local governments at their request to discuss the zoning issue.
- * 1989 - Research Project 87-29 was undertaken and completed by the Pennsylvania Department of Transportation, Bureau of Aviation. The Airport Hazard Zoning Study (Research Project 87-29) identified and contacted all affected municipalities within each airport's Part 77 conical surface. The Airport Hazard Zoning Study informed the municipalities of their responsibilities as outlined in State law and provided them with a specific model zoning ordinance and zoning map so that each municipality could be compliant with Act 164.

Act 164 addresses compatibility in the environs of each airport only as it relates to height. For Pennsylvania's aviation system to be truly protected as a transportation and economic resource, however, further efforts are needed to

Control the use of land within the Part 77 surfaces. Experience has shown that height regulation within the airport hazard area (Part 77) must be supported by compatible land use for areas encompassed by portions of the Part 77 surfaces.

This document builds upon the Airport Hazard Zoning Study by preparing and presenting for each airport and affected municipality throughout the Commonwealth recommended Land Use Guidelines for areas falling within portions of the Part 77 surfaces.

Through continuing emphasis on educations, it is the goal of the Pennsylvania Department of Transportation, Bureau of Aviation to provide further protection to the Commonwealth's aviation resources. When adopted and enforced in tandem, Act 164 and these Land Use Compatibility Guidelines can provide both height and land use compatibility within the environs of Pennsylvania's airports.

WHY IS COMPATIBLE LAND USE PLANNING AROUND PENNSYLVANIA'S AIRPORTS IMPORTANT?

Incompatible land use around airports is a major concern facing aviation today. Off-airport land use incompatibility threatens the usefulness of many airports. There are many benefits of an airport to the community it serves. In the Commonwealth of Pennsylvania, aviation provides time-saving access to and from different parts of the Commonwealth, the country, and the world. Proximity to airports increases business opportunities by providing Pennsylvania's business community with access to worldwide markets. Airports also provide a gateway to Pennsylvania for out-of-state tourists and business travelers. Another benefit of airports in the Commonwealth of Pennsylvania is that they serve as a means by which emergency and health services are provided. Communities benefit economically whether they are served by an airport which has regularly scheduled commercial flights or by a general aviation airport. It extends to hotels, rental cars, manufacturing, real estate, and a wide variety of other industries whose success depends on air travel as an efficient mode of transportation for both people and goods.

To measure the value of its airport system to the Commonwealth, the Pennsylvania Bureau of Aviation recently updated (November 1995) its Statewide Aviation Economic Impact Study; a similar study had been conducted by the Bureau of Aviation in 1988. The update showed that the economic benefits of aviation in Pennsylvania are increasing. In 1988, the Commonwealth's airport system contributed statewide in some way to supporting approximately 153,375 airport tenant and aviation visitor-related jobs.

By 1994, this number of jobs had increased to 228,969; annual payroll associated with these jobs was \$4.4 billion. According to the most recent study, airport tenants, aviation users, and air travelers to Pennsylvania spend an estimated \$10.7 billion annually. This figure was up from an estimated \$9.5 billion in statewide spending in 1988. Clearly, Pennsylvania's airport system is an important economic resource which merits preservation and protection through compatible land use planning and height restrictions.

The promotion of compatible land use around an airport must be accomplished at the municipal level, since local governments have the authority to direct land use development. These guidelines provide different approaches that can be taken to promote compatible land use around airports. Jurisdiction over the Commonwealth's airway system in matters of safety is vested in the Pennsylvania Department of Transportation, Bureau of Aviation, and the Federal Aviation Administration (FAA). The Bureau strongly recommends that each municipality that is within an airport hazard area (as defined by the Part 77 conical surface), implement actions described in these Guidelines to preserve their aviation facility and to protect their municipality. When the Bureau of Aviation issues grants for airport improvement projects, the presence of airport zoning is one of the criteria used to determine the priority for funding projects.

The Commonwealth has been actively involved in helping municipalities protect the airspace around their airports. In 1984, the Commonwealth passed the "Airport Zoning Act" or Act 164, setting the framework and guidelines for airport height zoning at the municipal level. Act 14 mirrors Federal Aviation Regulation (FAR) Part 77-Objects Affecting Navigable Airspace. Act 164 is a mandatory requirement for municipalities affected by an airport hazard area. The Bureau of Aviation encourages municipalities to adopt Act 164 by providing educational assistance.

WHY IS THE AIRPORT SPONSOR COMMITTED TO COMPATIBLE LAND USE PLANNING?

Airports are an important element in Pennsylvania's multimodal transportation system, and they need to be protected through the administration of effective controls on surrounding land use. As development occurs in the airport environs, the impact of land use incompatibility faces many of Pennsylvania's airports. Recent Federal transportation language requires coordination between transportation modes as airports, highways and rail intersects in their functions.

Congress requires an airport sponsor requesting Federal aid from the FAA under the Airport Improvement Program (AIP) as amended, to document the actions they have taken to restrict the use of land adjacent to, or in the immediate vicinity of the airport, to activities and purposes which are compatible with normal airport operations. In addition, the airport sponsor must specify how this has been accomplished by providing information on any zoning or laws enacted which restrict the use of land adjacent to or in the vicinity of their airport.

The role of the airport sponsor in the land use planning is to interpret the activities and functions of the airport to the public and to the local controlling governmental body or municipality. It is the airport sponsor's responsibility to make sure that all applicable units of government understand its commitment to the assurances the airport makes when receiving money for Federally or State funded projects. Each time an airport sponsor accepts Federal funding for an airport project, several commitments are made to the FAA, including:

- * The airport will remain open to the public for 20 years from the date of the grant
- * The Airport sponsor will prevent the growth or establishment of obstructions in the aerial approaches as defined by FAR Part 77
- * The airport sponsor will assure that the airport's terminal airspace is adequately cleared and protected by removing, lowering, relocating, marking, or lighting or otherwise mitigating existing airport hazards
- * The airport sponsor will, to the extent reasonable, restrict (including the adoption of zoning) the use of land adjacent to or in the immediate vicinity of the airport to activities and purposes compatible with normal airport operations

Failure to fulfill these assurances can result in loss of future Federal funding and possible repayment of Federal funds that have been received by the airport in the past.

If an airport accepts a grant from the Pennsylvania Department of Transportation, it must enter into an agreement with the Department to maintain the property as an airport for at least ten years after accepting State grant money. Not only must the property be maintained as an airport, the facility must maintain its level of service for ten years from the date when the grant is initially received. If the agreement is violated, the owner of the airport is liable for the repayment of the total appropriation for that year, plus a penalty of two times the grant amount.

There are many privately-owned, public-use airports in the Commonwealth that have not received Federal or State grant monies. Even though these airport owners are not under any grant obligations to the FAA or the Bureau of Aviation, these airports need to maintain their FAR Part 77 surfaces to prevent potential obstructions. All airport owners/operators in the Commonwealth should follow the compatible land use recommendations contained in these Guidelines. Obstructions and incompatible land use can limit the future operation and development of any airport.

Airport sponsors, in conjunction with other impacted entities (cities, boroughs, and townships within the airport hazard area or Part 77 surfaces), should consider appropriate land use controls for land near their airport. Adequate safeguards should be incorporated to prevent incompatible land uses or objects which violate Part 77 height restrictions from developing in proximity to their airport. These Guidelines describe and define areas around the airport that should be protected. They also describe both preventive measures and corrective actions that can be adopted to assure that the utility of Pennsylvania's airport system will not be jeopardized by land use or obstruction-related issues.

WHY IS LAND USE INCOMPATIBILITY A PROBLEM FOR MANY AIRPORTS?

Land use problems associated with airports have emerged over many years. When most airports were first built, they were located away from developed areas. Initially, most airport sites were surrounded by agricultural or undeveloped land. For many airports however, this luxury of being unencroached by surrounding development did not last. Various types of development, both compatible and incompatible, were attracted to the airport environs. Development around airports is a natural by-product of our mobile society. Development in an airport's environs becomes a problem when it restricts an airport's growth or its ability to operate. **Exhibit 1** provides an example of development encroachment that has occurred around the Carlisle Airport in Cumberland County.

Many of Pennsylvania's airports are located in one or more municipalities which have no zoning and/or very few land use controls. Approximately 35 percent of the Commonwealth's municipalities have no zoning ordinances. These unzoned municipalities are predominately located in rural and less developed areas. Airports located in these unzoned municipalities have no control over the type of land use that can locate in its environs. Although land use incompatibility may not yet be a problem at a particular airport, now is the time to implement

these Guidelines to insure that the airport operating environment is protected.

WHAT TYPE OF DEVELOPMENT IS COMPATIBLE WITH AN AIRPORT AND ITS OPERATION?

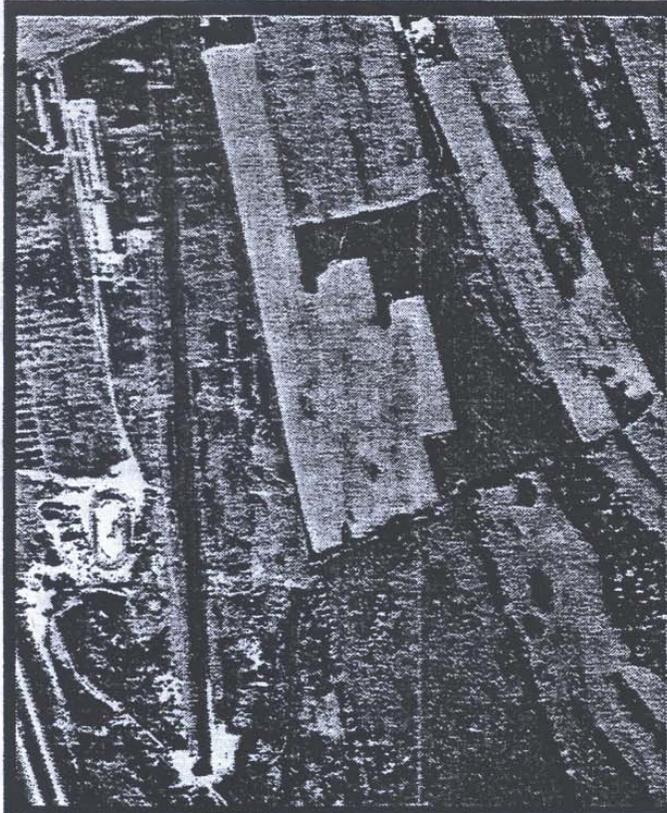
Development in the airport environs should not pose a safety hazard to pilots in the air or to persons on the ground. Nor should development in the airport environs be noise sensitive.

Determining whether a given type of development or land use is compatible with a particular airport depends on things such as the location and size of the airport and the type and volume of aircraft using the facility. The height of development in relation to the airport's Part 77 surfaces is also paramount to this determination. Most commercial-industrial uses are compatible with airports and their operations. Motels, restaurants, warehouses, shipping agencies, aircraft-related industries, as well as industries that benefit from access to an airport, are usually compatible with an airport and lists operations. Buildings and structures on and around an airport should not obstruct aerial approaches, interfere with aircraft radio communications, or affect a pilot's vision due to glare or bright lights. Motels, restaurants, and office buildings that are developed in the airport environs should be soundproofed to make them more compatible. Other land uses which can be compatible with airports are parks, conservatory areas, open spaces, forestry services, landscape services, and golf courses.

Agriculture is another land use that is usually compatible with airport operations. Agricultural land use also permits the owner of property near the airport to make efficient use of the land, while providing an additional benefit to the community in terms of airport protection. While some types of animal husbandry are sensitive to aircraft noise, most agricultural uses are not adversely affected by airport operation. Any agricultural activity in the airport environs should be such that it does not attract birds or other wildlife that could pose a hazard to aircraft operations.

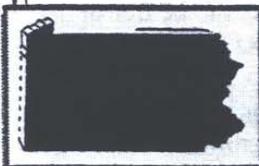
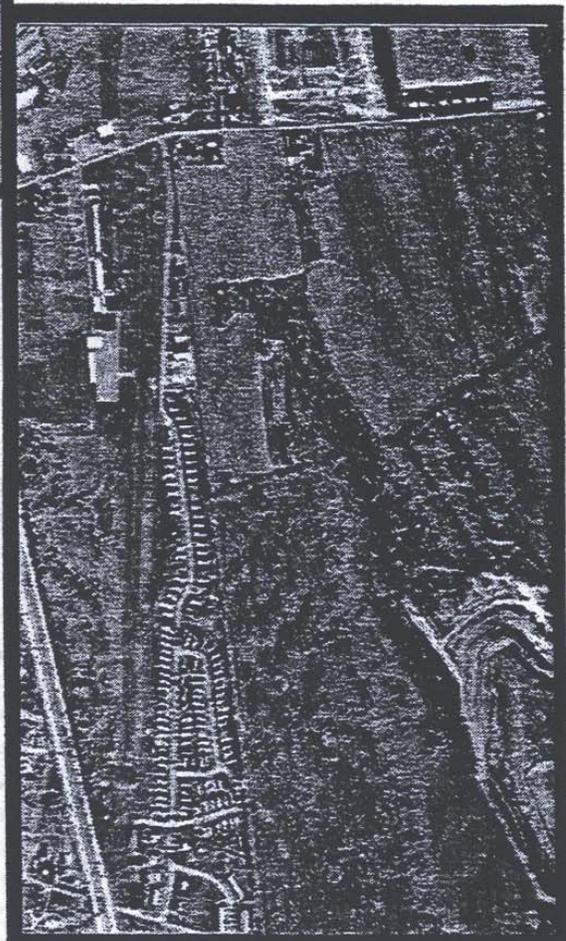
Residential housing is usually incompatible with aircraft operations. As residential use expands into areas around an airport, homeowners inevitably express concerns regarding safety and airport-related noise. Residential growth can restrict an airport by occupying land needed for expansion and by removing an appropriate buffer between the airport and noise sensitive development. This buffer is important because it diminishes the impact of aircraft noise and lessens the possibility of an aircraft incident in a residential neighborhood. With careful planning, there is no reason for

How Land Use has Evolved as a Major Issue Facing Pennsylvania Airports



◀ In 1968, many areas around Carlisle Airport were relatively undeveloped.

▶ By 1994, significant residential development had occurred in the areas around Carlisle Airport. Further residential development is likely in proximity to the airport unless land use controls are adopted.



Pennsylvania Land Use
Compatibility
Guidelines

**EXAMPLE OF
DEVELOPMENT ENCROACHMENT**

Exhibit
1

encroachment on an airport by incompatible land use. Residential neighborhoods, schools, churches, hospitals, and other similar noise sensitive land uses are most susceptible to noise impacts generated by aircraft operations. It is not in the best interest of the airport owner or the municipality to allow noise sensitive land uses to locate where they will be subject to impact from aircraft takeoffs and landings.

The most critical location with regard to the height of objects around an airport is beneath the corridors used to land at and depart from an airport. Tall objects in airport can also adversely affect minimum instrument approach altitudes. The siting of multi-story buildings, power lines, and communication towers should be carefully considered in relation to an airport using airport-specific information published in the previous 1989 Airport Hazard Zoning Study.

Subsequent sections of these Guidelines provide more information on the exact areas around an airport that should be protected from incompatible development. Generally speaking, the following factors should be considered when development in the airport environs is proposed:

- * Lights that shine upward around an airport are potentially hazardous since they can detract from a pilot's ability to identify an airport at night. A pilot may perceive such lights from adjacent land use as part of the airport and/or runway lights.
- * Reflective surfaces can produce a blinding glare, distracting pilots. Other visual difficulties can result from smoke generated by nearby business, industry, or field burning operation. Reflective surfaces and smoke generating activities should be discouraged around airports.
- * Land uses that generate electronic transmissions should not be permitted near airports. Such uses can interfere with aviation navigational signals and radio communications.
- * Land uses such as water impoundments, garbage dumps, sanitary landfills, or sewage treatment plants often attract birds. Increased numbers of birds around airports escalate the possibility of collisions between birds and aircraft. FAA Order 5200.5, Guidance Concerning Sanitary Landfills On or Near Airports, states that sanitary landfills, because of their bird attractant qualities, are considered to be an incompatible land use, if located within specified distances determined by the FAA. As stated in FAA Order 5050.4A, Airport Environmental Handbook, the FAA advises against locating such facilities within 5,000 feet of all runways accommodating or planned to accommodate piston-type aircraft and

within 10,000 feet of all runways accommodating or planned to accommodate turbine (jet) powered aircraft. FAA has in "draft" form Advisory Circular 150/5200-32, "Airport Wildlife Hazard Management," which provides additional information on dealing with wildlife issues in the airport environs.

- * Land uses which promote the assembly of large groups should also be discouraged from locating in proximity to an airport; all noise sensitive land uses should also be discouraged from locating in the airport environs.

These general standards are the basis for specific recommendations contained in these Land Use Compatibility Guidelines.

WHAT AREAS SHOULD I PROTECT AROUND MY AIRPORT?

Protection of Pennsylvania's airports from incompatible encroachment is important for economic reasons. Control of land use and the height of objects around an airport is also mandated by grant assurances that the airport sponsor signs when they accept Federal funding from the FAA. While some types of land use and certain activities are usually compatible in the airport environs, others are not. It is important for each airport sponsor to know what areas they should protect around their airport and also to understand why these areas should be protected.

There are two issues that affect land use planning in the airport environs: safety and noise. Both of these issues must be considered when planning for airport land use compatibility. A primary concern in achieving airport land use compatibility involves safety at and around an airport. All modes of transportation, inherently, pose some safety risk. It is important to identify those safety risks associated with air transportation in order to minimize the potential consequences of an accident. Specific areas near airports are exposed to various levels of accident potential. Identifying and protecting these specific areas around an airport through effective land use control is essential to ensuring the safe and efficient operation of an airport and to protecting the public. Areas around the airport also need to be free of development that can pose a hazard to pilots operating aircraft in the airport environs. Safe access to an airport can be achieved through municipal transportation and land use plans that coordinate airport and community growth.

FAR Part 77 surfaces and FAA Safety Zones described in these Guidelines (see page 11) identify all appropriate areas around an airport that need to be controlled to promote safety. To achieve airport-environs compatibility, minimizing aircraft noise impacts on areas surrounding the airport is important. Noise, very simply, is unwanted sound. Aircraft sounds are perceived differently by different individuals. However, concerns about aircraft noise are often reflections of the degree to which aircraft noise intrudes on existing background noise. In general, where ambient noise is low, aircraft noise is perceived as a problem.

Historically, airports were constructed on the outskirts of municipalities. Aircraft noise was not a problem since the airport was located at a significant distance from developed areas. Through the years, development often expanded toward the airport. As communities expanded toward an airport, land uses which are sensitive to noise have developed closer to the airport. Aircraft noise is determined by the type of aircraft operating at an airport, the volume of aircraft operations experienced at an airport, and the time of day (or night) the operations are performed. Inappropriate development near airports increases the perceived impact of aircraft noise.

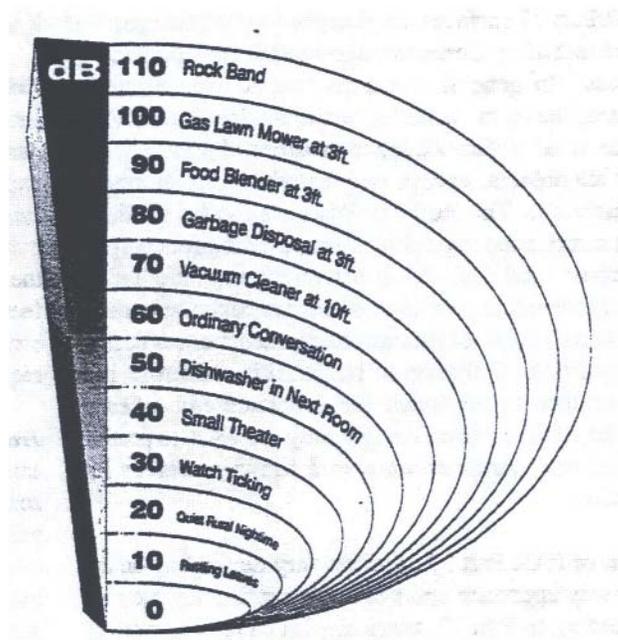
Noise impact areas for an airport are identified by noise contours. The basic methodology employed to define aircraft noise levels involves the use of a mathematical model. The FAA Integrated Noise Model (INM) contains a database which relates noise levels to each specific type of aircraft. Equal noise levels are then indicated by a series of contour lines superimposed on a map of the airport and its environs. The noise contours show the level of noise as measured in decibels (dB) using the A-weighted decibel scale (dBA). These contours show the average noise level over a 24 hour period with a 10 dB penalty applied to noise events occurring between the night-time hours of 10:00 p.m. to 7:00 a.m., local time. The 10-decibel penalty applied to noise events occurring at night represents the difference in the perception of sound levels between day and night. This measurement is called the day-night average sound level (DNL).

The FAA uses 65 DNL as the lower threshold or minimal level of noise exposure for defining land use which is incompatible from a noise standpoint. In general, areas which fall outside the 65 DNL contour are suitable for most types of development, at least from a noise perspective. The responsibility for determining acceptable and permissible land uses and the relationship between specific properties and specific noise contours rests with the local authorities. FAA determinations in FAR Part 150 are not intended to substitute those land uses determined to be appropriate by local authorities in response to local needs and values in achieving noise compatible land uses.

Noise sensitive land uses should definitely be discouraged in areas subject to noise impacts of 65 DNL or higher. As shown in **Exhibit 2**, many common noise events exceed the 65 dB threshold. Within FAR Part 150, the FAA also provides guidance for land falling within the 70, 75, and 80 DNL contours. For many airports in the Commonwealth, the 65 DNL contour falls on property controlled by the airport. Only at the Commonwealth's largest and busiest airports where operations by turbojet aircraft occur on a regular and frequent basis does the 65 DNL contour usually extend beyond airport property. From a planning perspective, if airport owners and operators take steps to adopt the Land Use Guidelines outlined in this document, areas subject to adverse noise impacts will in almost all cases be addressed. Larger airports, especially the scheduled service airports in the Commonwealth should, however, periodically have their own noise contours generated by the most recent version of INM.

WHAT AREAS DOES THE FAA RECOMMEND AN AIRPORT SHOULD PROTECT?

Specific areas to be secured at and around an airport are defined by two major Federal Aviation Administration criteria; the first is Federal Aviation Regulation (FAR) Part 77 - Objects Affecting Navigable Airspace and the second is



dB - Sound level in decibel units
Exhibit 2 Common Sounds and their Noise Levels

FAA Safety Zones (as defined by FAA airport design standards). As noted, noise impacted areas within the airport environs often fall within the same areas covered by the Part 77 and Safety Zones. The FAA cannot stop construction of an obstacle that violates critical Part 77 surface if this development is not on dedicated airport property on a Federally obligated airport. However, FAA response to the Federal Communications Commission (FCC) licensing of towers can be helpful to deterring the establishment of tall towers near airports. FAR Part 77 establishes standards for determining which structures pose potential obstructions, from a height perspective, to safe air navigation. Part 77 does this through defining specific airspace areas around an airport that should not contain any protruding objects. These airspace areas referred to as "imaginary surfaces." Objects affected include existing or proposed objects of natural growth; terrain; or permanent or temporary construction, including equipment which is permanent or temporary in character. An FAA airspace study may determine that objects can in fact penetrate some imaginary surfaces, but they may need to be lighted and marked. Other noted obstructions, after FAA study, may require no treatment at all or objects may need to be removed. The imaginary surfaces outlines in FAR Part 77 include:

- * Primary Surface
- * Transitional Surface
- * Horizontal Surface
- * Conical Surface
- * Approach Surface

While FAR Part 77 surfaces are designed to protect specific airspace areas, Safety Zones are designed to protect specific ground areas. In general, the term "surface" refers to an airspace area; the term "zone" refers to the land underlying the airspace area. Safety Zones are required by the FAA to be free of all objects, except objects whose locations are fixed by function. The Runway Protection Zone (RPZ) is the critical safety zone to protect when planning for compatible off-airport land use. Each active runway end has an RPZ; actual dimensions for these zones are described subsequently in this section. Most aircraft accidents occur during the landing or takeoff portion of flight. It is therefore, important to protect the approach and departure ends of each runway. The RPZ has been designed by the FAA to protect the approach and departure ends of a runway, thereby increasing safety.

Dimensions of FAR Part 77 surfaces vary depending on the type of runway approach and type of aircraft using the runway. According to Part 77, there are three types of runway approaches; visual, non-precision, and precision. These approaches are defined in the following paragraphs.

A visual approach runway is one with either no instrument approach capabilities or where the existing or planned instrument approach is circling, rather than a straight-in approach. A circling approach required the pilot to have visual contact with the runway while aligning the aircraft with the runway for landing.

A nonprecision instrument runway has one or more devices capable of providing horizontal guidance to aircraft, aligning them with the runway for straight-in approaches.

A precision instrument runway has approaches using an Instrument Landing System (ILS), a Precision approach Radar (PAR), or a Microwave Landing System (MLS). These approach systems provide both vertical and horizontal alignment of aircraft to a particular runway. Airports with scheduled commercial passenger traffic and heavily-used general aviation airports normally have existing or planned precision approaches.

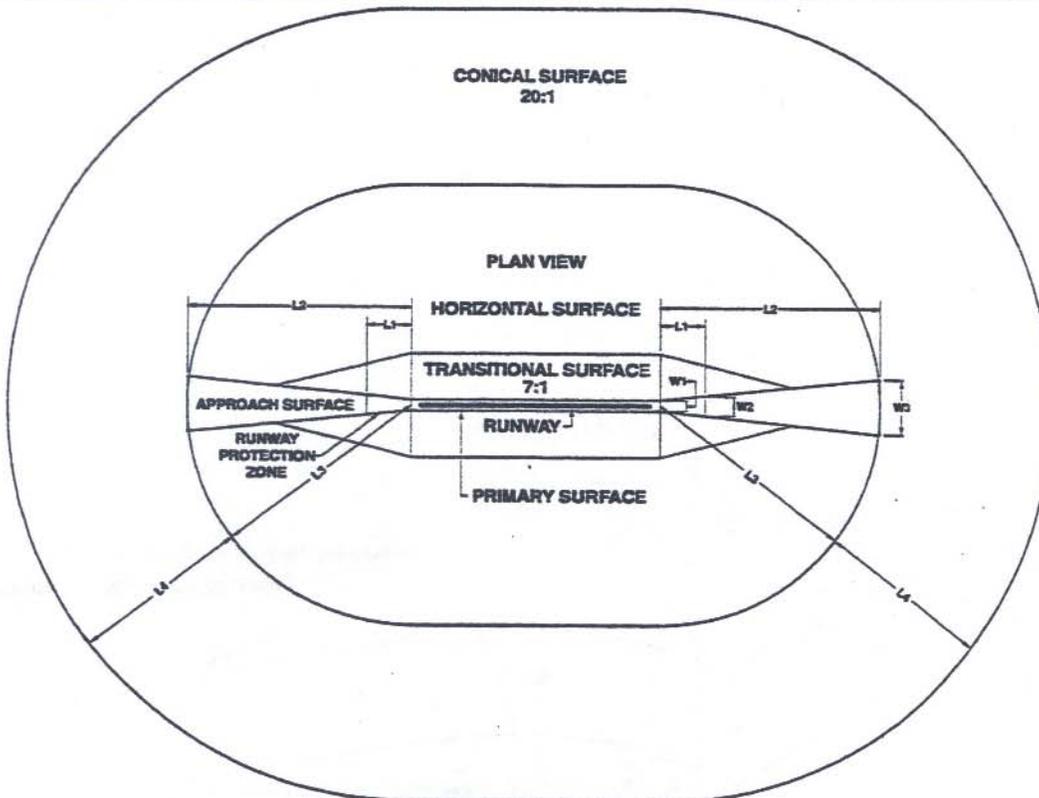
The dimensions of an airport's Runway Protection Zones (RPZs) are based on the approach speed of the most demanding aircraft using the runway and on approach visibility minimums. Approach visibility minimums are separated into three categories. These categories include visual or not lower than one mile, between three-quarters and lower than one mile, and lower than three-quarters of a mile.

Definitions for the FAR Part 77 surfaces and the FAA Safety Zones are as follows:

FAR PART 77 SURFACES

Primary Surface: (Exhibit 3 - W1) the primary surface is longitudinally centered on the runway. When the runway has a specially prepared hard surface, the primary surface extends 200 feet beyond each end of the runway. When the runway has no specially prepared hard surface, or planned hard surface, the primary surface terminates at each end of the runway. The width of a primary surface ranges from 250 feet to 1,000 feet depending on the existing or planned approach and runway type. Exhibit 3 depicts the dimensional requirements of the primary surface.

Transitional Surface: (see Exhibit 4) Transitional surfaces extend outward and upward at a slope of seven (7) feet horizontally for each foot vertically (7:1) from the sides of the primary and approach surfaces. The transitional surfaces extend to where they intercept the horizontal surface at a height of 150 feet above the runway elevation. For precision approach surfaces, which project through and beyond the limits of the conical surface, the transitional surface also extends a distance of 5,000 feet measured horizontally from the edge of the approach surface and at right angles to the



FAR PART 77 "IMAGINARY SURFACES" DIMENSION REQUIREMENTS

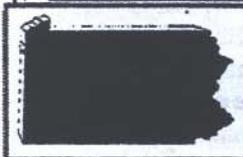
Runway Type	Runway End		Conical Surface (L4)	Horizontal Surface (L3)	Approach Surface			Approach Slope	Primary Surface Width	Transitional Surface
	Approach	Other			Length (L2)	Inner Width (W1)	Other Width (W3)			
Small Airplanes ²	V	V	4,000	5,000	5,000	250	1,250	20:1	250	7:1
		NP	4,000	5,000	5,000	500	1,250	20:1	500	7:1
		NP 3/4	4,000	5,000	5,000	1,000	1,250	20:1	1,000	7:1
		P	4,000	5,000	5,000	1,000	1,250	20:1	1,000	7:1
	NP	V	4,000	5,000	5,000	500	2,000	20:1	500	7:1
		NP	4,000	5,000	5,000	500	2,000	20:1	500	7:1
		NP 3/4	4,000	5,000	5,000	1,000	2,000	20:1	1,000	7:1
		P	4,000	5,000	5,000	1,000	2,000	20:1	1,000	7:1
Large Airplanes ³	V	V	4,000	5,000	5,000	500	1,500	20:1	500	7:1
		NP	4,000	10,000	5,000	500	1,500	20:1	500	7:1
		NP 3/4	4,000	10,000	5,000	1,000	1,500	20:1	1,000	7:1
		P	4,000	10,000	5,000	1,000	1,500	20:1	1,000	7:1
	NP	V	4,000	10,000	10,000	500	3,500	34:1	500	7:1
		NP	4,000	10,000	10,000	500	3,500	34:1	500	7:1
		NP 3/4	4,000	10,000	10,000	1,000	3,500	34:1	1,000	7:1
		P	4,000	10,000	10,000	1,000	3,500	34:1	1,000	7:1
Large and Small Airplanes	NP 3/4	V	4,000	10,000	10,000	1,000	4,000	34:1	1,000	7:1
		NP	4,000	10,000	10,000	1,000	4,000	34:1	1,000	7:1
		NP 3/4	4,000	10,000	10,000	1,000	4,000	34:1	1,000	7:1
		P	4,000	10,000	10,000	1,000	4,000	34:1	1,000	7:1
	P	V	4,000	10,000	10,000/40,000	1,000	4,000/16,000	50:1/40:1	1,000	7:1
		NP	4,000	10,000	10,000/40,000	1,000	4,000/16,000	50:1/40:1	1,000	7:1
		NP 3/4	4,000	10,000	10,000/40,000	1,000	4,000/16,000	50:1/40:1	1,000	7:1
		P	4,000	10,000	10,000/40,000	1,000	4,000/16,000	50:1/40:1	1,000	7:1

1 - In Feet
 2 - Less than 12,500 lbs maximum certified takeoff weight
 3 - Greater than 12,500 lbs maximum certified takeoff weight

V = Visual approach 20:1
 NP = Nonprecision approach 34:1
 NP 3/4 = Nonprecision approach with visibility minimums as low as 3/4 statute miles 34:1
 P = Precision approach 50:1

Note: L1 is the length of the RPZ and W2 is the outer width of the RPZ as defined by approach visibility minimums

Source: Federal Aviation Administration



Pennsylvania Land Use
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**FAR PART 77 SURFACES
AND DIMENSION REQUIREMENTS**

Exhibit
3

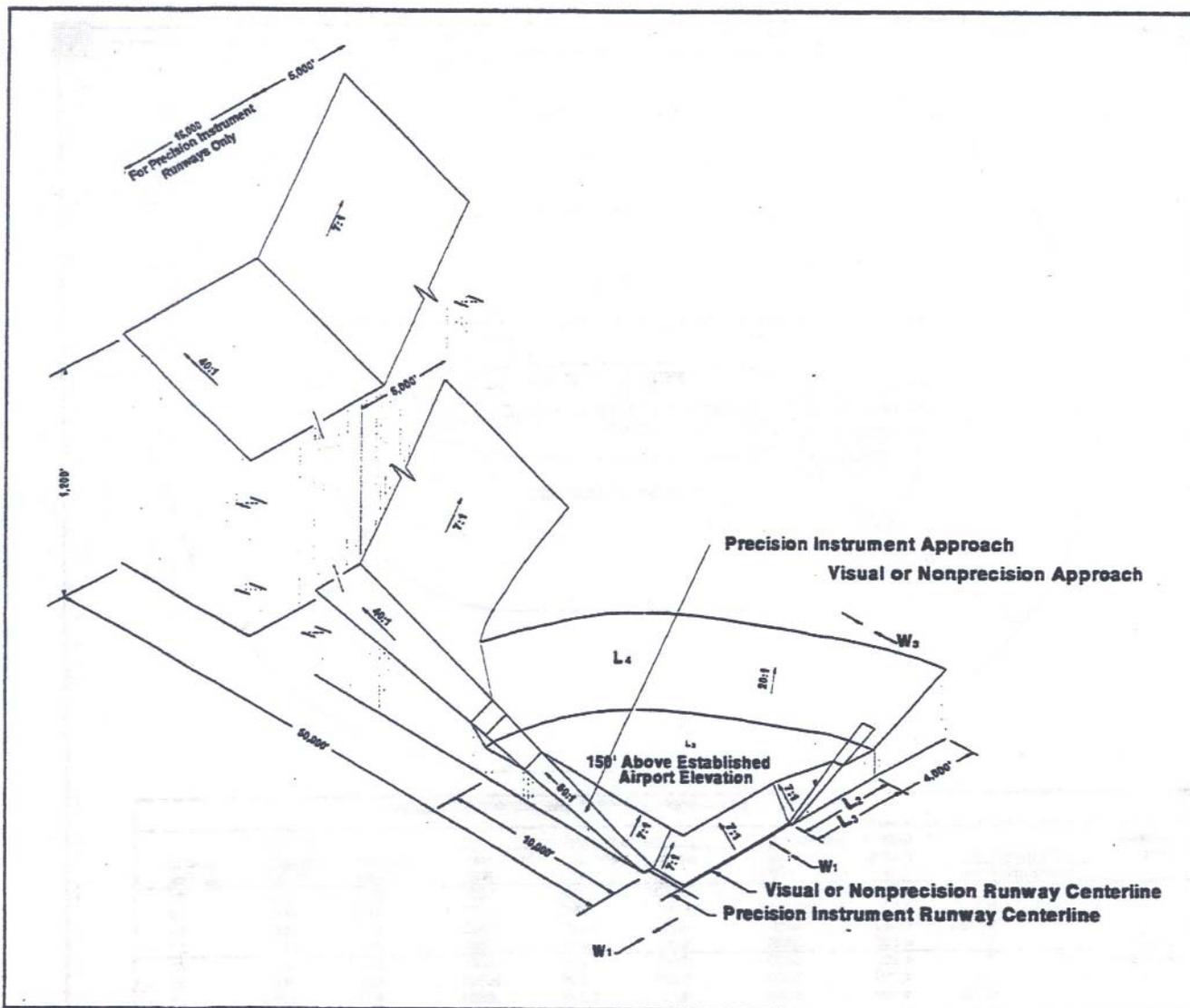


Exhibit 4 Part 77 Surfaces

runway centerline. Exhibit 3 depicts the dimensional requirements of the transitional surface.

Horizontal Surface: (Exhibit 3 - L3) The horizontal surface is a horizontal plane located 150 feet above the established airport elevation, covering an area from the transitional surface to the conical surface. The perimeter is constructed by swinging arcs from the center of each end of the primary surface and connecting the adjacent arcs by lines tangent to those areas. The radius of each arc is either 5,000 feet for all runway ends designated as utility or visual or 10,000 feet for all other runway ends. Exhibit 3 depicts the dimensional requirements of the horizontal surface.

Conical Surface: (Exhibit 3 - L4) The conical surface is a surface extending upward and outward from the periphery of the horizontal surface at a slope of one foot for every 20 feet (20:1) for a horizontal distance of 4,000 feet.

Approach Surface: (Exhibit 3 - L2, W1, and W3) longitudinally centered on the extended runway centerline, the approach surface extends outward and upward from the end of the primary surface. An approach surface is applied to each end of each runway based upon the type of approach the approach slope of a runway is either 20:1, 34:1, or 50:1. The length of the approach surface varies, ranging from 5,000 feet to 50,000 feet. The inner edge of the approach surface is the same width as the primary surface, and it expands uniformly to a width ranging from 1,250 feet to 16,000 feet,

depending on the type of runway and approach. Exhibit 3 depicts the dimensional requirements of the approach surface.

Exhibit 3 graphically illustrates the FAR Part 77 "Imaginary Surfaces" in plan view and Exhibit 4 provides profile view representations; the dimensional requirements for each of the FAR part 77 surfaces are also presented.

Although the FAA can determine which structures are obstructions to air navigation, the FAA is not authorized to regulate tall structures. The FAA can only study structures that it is notified about. The FAA has the authority to determine which structures should be lighted or marked. Airport owners need to help identify possible obstructions. Under FAR Part 77, an aeronautical study can be undertaken by the FAA to determine whether the structure in question would be a hazard to air navigation. However, there is no specific authorization in any statute that permits FAA to limit structure heights. The FAA acknowledges that state or local authorities have control over the appropriate use of property beneath an airport's airspace.

FAA SAFETY ZONES

Safety Zones are defined by FAA airport design criteria standards to allow for the safe and efficient operation of an airport. These Safety Zones include the Runway Protection Zone (RPZ), the Runway Safety Area (RSA), the Runway Object Free Area (OFA), and the Object Free Zone (OFZ). Each of these zones is discussed in the following sections. Safety Zone dimensions vary depending on approach visibility minimums and the type of aircraft using a runway. The FAA uses the Airport Reference Code (ARC) to relate airport design criteria to the operational and physical characteristics of the airplanes operating at each specific airport. The ARC has two components which relate an airport's design to its "critical" aircraft. The critical aircraft is defined as the most demanding aircraft that uses an airport on a regular basis (500 operations per year). The first component of the ARC, depicted by a letter, is the aircraft approach category as determined by the approach speed of the critical aircraft. The second component, depicted by a Roman numeral, is the airplane design group as determined by the wingspan of the critical aircraft. **Table 1** presents examples of typical aircraft classifications for each approach Category and Airplane Design Group.

Runway Protection Zone: Runway Protection Zones (RPZs), formerly clear zones, were originally established to define land areas underneath aircraft approach

paths in which control by the airport operator is highly desirable to prevent the creation of airport hazards or the development of

incompatible land use. The RPZ functions to protect people and property on the ground.

A Runway Protection Zone (RPZ) is an area that begins at a point 200 feet beyond the end of a paved runway or at the end of the runway for turf runways. The length of the RPZ extends 1,000, 1,700, or 2,500 feet depending on the category of runway and approach. The inner width of a RPZ is located closest to the runway end. Opposite this end is the outer width, which is the wider end. The inner width of a RPZ varies from 250 feet to 1,000 feet. The outer width of a RPZ varies from 450 feet to 1,750 feet. As with the length of the RPZ, the inner and outer widths of a RPZ are dependent on the runway category and approach. Exhibit 5 depicts a schematic of the RPZ and presents its required dimensions by runway category and runway approach type.

TABLE 1		
FAA AIRCRAFT CLASSIFICATIONS		
FAA AIRCRAFT APPROACH CATEGORY CLASSIFICATION		
<u>Approach Category</u>	<u>Approach Speed in Knots</u>	
A	Less than 91	
B	91 but less than 121	
C	121 but less than 141	
D	141 but less than 165	
E	165 or greater	
FAA AIRPLANE DESIGN GROUP CLASSIFICATION		
<u>Airplane Design Group</u>	<u>Wing span (feet)</u>	<u>Typical Aircraft</u>
I	Less than 49	Cessna 172, Piper Navajo, Learjet 24, Rockwell Sabre 75A
II	49 but less than 79	Citation V, Super King Air, Rockwell Sabre 80
III	79 but less than 118	B-727, B-737, BAC-111, DC-9, Convair 580
IV	118 but less than 171	A-300, A-310, B-707, DC-8, B-757, B-767, L1011, DC10, C-130
V	171 but less than 197	B-747
VI	197 but less than 262	Future
Source: FAA Advisory Circular 150/5300-13, "Airport Design."		

Runway Safety Area: The RSA is a critical two-dimensional safety area surrounding the runway. RSAs should be cleared and graded and free of potentially hazardous surface variations. The RSA should be properly drained and capable of supporting snow removal, aircraft rescue and firefighting (ARFF) equipment, or an aircraft without causing damage to the aircraft. The size of the RSA is dependent upon the runway design category and approach. The runway design criteria is established by the critical or most demanding aircraft that operates on the runway on a regular basis. Taxiways also have similar safety area requirements. These areas should not be cultivated, since a turf surface is needed to support aircraft and emergency vehicles.

Runway Objects Free Area: the runway OFA is a two-dimensional ground area surrounding the runway. FAA standards prohibit parked aircraft and objects from locating within the OFA. The runway OFA extends beyond the runway end at lengths that vary from 240 feet to 1,000 feet, depending on the runway design category and the approach type. There are also taxiway OFAs.

Obstacle Free Zone (OFZ): The OFZ clearance standard precludes taxiing and parked aircraft and object penetrations, except for frangible visual NAVAIDS that need to be located in the OFZ because of their function. The runway OFZ, when applicable; the inner-approach OFZ; and the inner-transitional OFZ comprise the obstacle free zone (OFZ).

The runway OFZ is a defined volume of airspace centered above the runway centerline. The runway OFZ is the airspace surface whose elevation at any point is the same as the elevation of the nearest point on the runway centerline. The runway OFZ extends 200 feet beyond each end of the runway. Its width varies from 120 feet to 400 feet, depending on whether the runway is designed for small or large airplanes.

The inner-approach OFZ is a defined volume of airspace centered on the approach area. It applies only to runways with an approach lighting system. The inner-approach OFZ begins 200 feet from the runway threshold, at the same elevation as the runway threshold, and extends 200 feet beyond the last light unit in the approach lighting system. Its width is the same as the runway OFZ, and it rises at a slope of 50 feet (horizontal) to 1 foot (vertical) from its beginning.

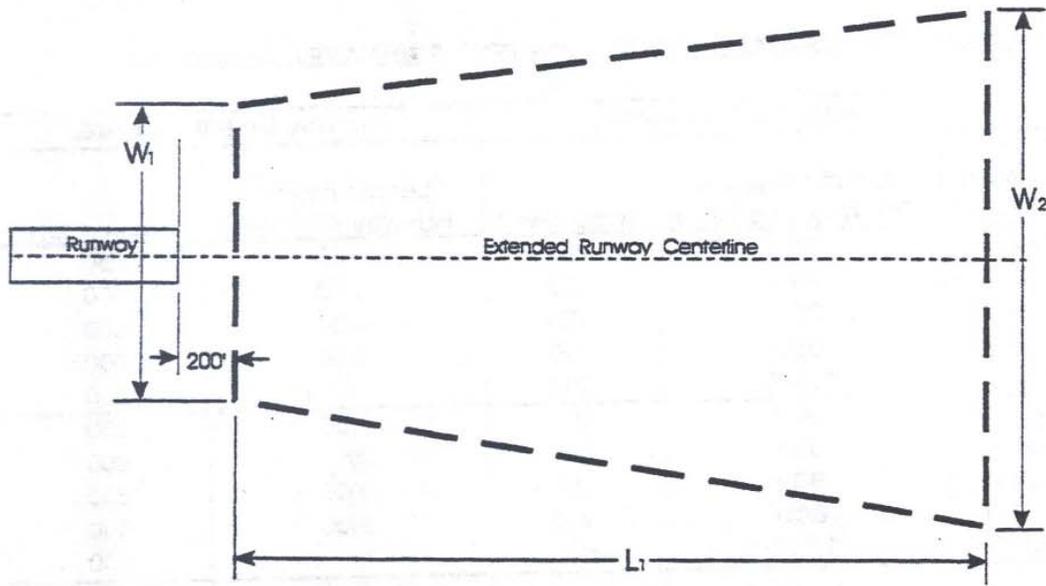
The inner-transitional OFZ is a defined volume of airspace along the sides of the runway OFZ and the inner-approach OFZ. It applies only to runways with lower than three-quarter statute mile approach visibility minimums. Table 2 (page 14) shows the dimensions of the RSA and the OFA. There are numerous RSAs and OFAs at Pennsylvania

airports that are Federally funded that do not meet specified FAA standards. In many instances, off-airport land acquisition is needed to bring airports into full compliance with the RSA and OFA standards. It is a major FAA objective to fund the outright ownership of the RFA, the OFA, and the extended runway safety area at all airports contained in the National Plan of Integrated Airport Systems (NPIAS). The FAA, as part of any runway enhancement project, strongly encourages airports to acquire in fee simple sufficient property interests to make the extended runway safety area and the OFA standard. Acquisition to provide the sponsor control over the RPZ is also recommended.

WHY IS IT IMPORTANT TO MONITOR DEVELOPMENT IN THE AIRPORT ENVIRONS?

Complex safety issues are major factors which affect pilots, airports, and surrounding airport land use. Part 77 surfaces and FAA Safety Zones provides specific standards for identifying which areas around an airport should be protected. The Part 77 surfaces and Safety Zones are important because they serve as a basis for the height zoning guidelines establishing Part 77 and Safety zone criteria, the FAA has used data to identify those areas around an airport which should be protected to reduce aircraft incidents. These data include the phase of operation during which aircraft accidents most often occur, the cause of these accidents, and the location of these accidents relative to the airport. Data have been collected by the FAA from the National Transportation Safety Board (NSB) regarding these factors.

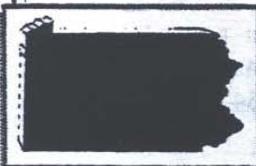
The NTSB maintains data on air carrier and general aviation accidents and their causes. **Table 3** shows the number of commercial and general aviation aircraft accidents that occurred during each portion of flight in 1990 (this is the most recent year for which such data are available). From an off-airport land use planning perspective, the characteristics of accidents near airports are of the greatest concern. The statistics presented in Table 3 show that, in 1990, 60 percent (28.0 and 32.0) of all commercial aircraft accidents and 64.1 percent (40.0 and 24.1) of all general aviation aircraft accidents occurred during the landing or takeoff portions of flight. The conclusion that most of the risk involved with air transportation is associated with the takeoff and landing portions of flight is supported by these statistics. The critical areas at an airport that need to be secured and protected from a land use compatibility standpoint include the approach and departure paths of the runways. It is best to maintain obstruction-free airport airspace and a reasonable amount of vacant land at both ends of each runway.



RUNWAY PROTECTION ZONE DIMENSION ¹ REQUIREMENTS					
Approach Visibility Minimums	Facilities Expected To Serve	Dimensions			
		Length (L_1) feet	Inner Width (W_1) feet	Outer Width (W_2) feet	Area (acres)
Visual or No lower than 1-mile	Small Aircraft Exclusively	1,000	250	450	8.035
	Aircraft Approach Categories A & B	1,000	500	700	13.770
	Aircraft Approach Categories C & D	1,700	500	1,010	29.465
Between 3/4 mile and 1 mile	All Aircraft	1,700	1,000	1,510	48.978
Less Than 3/4 mile	All Aircraft	2,500	1,000	1,750	78.914

1- In Feet

Source: Advisory Circular 150/5300-13, CHG 4, "Design Standards," Safety Zones.



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RPZ SCHEMATIC

**Exhibit
5**

TABLE 2

RUNWAY SAFETY AREA AND RUNWAY OBJECT FREE AREA REQUIREMENTS

Approach Visibility Minimums	Aircraft Approach Categories	Runway Safety Area		Runway Object Free Area	
		Length Beyond Runway End (feet)	Width (feet)	Length Beyond Runway End (feet)	Width (feet)
Visual or No Lower Than 3/4 Mile	A&B I ¹	240	120	240	250
	A&B I	240	120	240	400
	A&B II	300	150	300	500
	A&B III	600	300	600	800
	A&B IV	1,000	500	1,000	800
Less Than 3/4 of a Mile	A&B I ¹	600	300	600	800
	A&B I	600	300	600	800
	A&B II	600	300	600	800
	A&B III	800	400	800	800
	A&B IV	1,000	500	1,000	800
All Minimums	C&D	1,000	500	1,000	800

¹ These dimensional standards pertain to facilities for small aircraft exclusively.

Source: Advisory Circular 150/5300-13, CHG 4, "Design Standards," Safety Zones.

TABLE 3

NUMBER OF ACCIDENTS BY PHASE OF AIRCRAFT OPERATION IN 1990

Phase of Operation	Number of Accidents in 1990			
		Commercial		General Aviation
Approach/Descent/Landing	7	28.0%	897	40.0%
Takeoff/Climb	8	32.0%	540	24.1%
Cruise	4	16.0%	369	16.5%
Taxi	4	16.0%	61	2.7%
Static	2	8.0%	23	1.2%
Maneuvering	0	0.0%	303	13.5%
Other/Not Reported	0	0.0%	47	2.0%
	25	100.0%	2,240	100.0%

Source: National Transportation Safety Board

In addition to knowing the phase of operation during which aircraft accidents are most likely to occur, the most frequent cause of aircraft accidents should be identified. Table 4 identifies the cause of the aircraft accidents that occurred in 1990. In some cases, more than one factor contributed to an accident. Data presented in Table 4 indicate that commercial aviation aircraft accidents are most often attributed to pilot error. General Aviation aircraft accidents, however, are often related to terrain and obstructions surrounding an airport. In 1990, terrain ranked as the fourth leading factor associated with general aviation aircraft accidents.

Conflicts with objects, such as trees and wires, ranked as the fifth leading factor associated with general aviation accidents. A pilot's preoccupation with the terrain and structures immediately surrounding an airport can contribute to accidents. Structures in the approach path of a runway also contribute to aircraft accidents. Clearly, for the safety of both air travelers and the general public, it is best to maintain obstruction-free airspace around an airport. Adoption of Airport Hazard Zoning set forth in Act 164 can help to accomplish this objective.

TABLE 4

CAUSE OR FACTORS ASSOCIATED WITH AIRCRAFT ACCIDENTS IN 1990

<u>Cause/Factor</u>	<u>Number of Related Accidents</u>	
	<u>Commercial</u>	<u>General Aviation</u>
Pilot	10	1800
Terrain	0	454
Weather	7	485
Propulsion System/Controls	2	486
Object (tree, wires, etc.)	1	187
Other Person (not aboard)	7	176
Light Conditions	1	127
Landing Gear	1	68
Systems/Equipment/Instruments	2	83
Airframe	0	37
Flight Control System	0	43
Airport/Airways Facilities, NAVAIDS	2	14
Other Person (Aboard)	4	16

Source: National Transportation Safety Board

Perhaps the most critical factor in establishing Part 77 and Safety Zone criteria that form the basis for recommendations in the document is knowing where aircraft accidents occur. Data compiled by the NTSB indicate that the largest number of aircraft accidents occur on airport property. Specific data regarding the location of general aviation aircraft accidents, relative to the airport's location, are also available from the NTSB. With regard to general aviation aircraft accidents, data from the NTSB indicate that roughly 45 percent of all aircraft accidents occurred on airport property, 15 percent occurred within one mile of the airport, and 40 percent occurred beyond one mile of the airport. It is important to note that occurrence of these incidents is random; they do not coincide with the runway centerline. This indicates that 60 percent of all accidents occur within one mile of the airport. Considering the general aviation aircraft accidents that occurred within one mile of the airport, 33 percent of these occurred within one-quarter mile of the airport; 29 percent occurred in the airport traffic pattern; and the remaining 38 percent occurred within one-half mile to one mile of the airport. These data suggest that land use within one-half mile of an airport in all directions should be controlled, in addition to the land off the approach ends of the runways.

This information is further substantiated by **Exhibit 6** which is taken from FAA Advisory Circular 150/5300-13. As shown, 90 percent of all aircraft which undershoot or overshoot the runway and do so within 1,000 feet of the runway end; close to 98 percent of the aircraft do so within

1,600 feet of the runway end. The RPZ lengths are geared specifically to increase safety related to the data depicted in Exhibit 6.

A typical airport traffic pattern is depicted in Exhibit 7. All areas within an airport's traffic pattern should be considered for either land use planning or height zoning. If municipalities plan for compatible land use and/or adopt height zoning within the primary, approach, transitional, and horizontal surfaces as defined by Part 77, then the areas that fall under a typical traffic pattern will also be generally protected.

WHAT DOES THE BUREAU OF AVIATION RECOMMEND FOR COMPATIBLE LAND USE IN THE AIRPORT ENVIRONS?

In 1989, the Bureau of Aviation developed Part 77 surfaces for each of the public-use airports in the Commonwealth. Model zoning ordinances and maps were developed for each airport to reflect the height requirements established in the part 77 surfaces. Each municipality in the Commonwealth affected by a part 77 surface was mailed a copy of a map showing the Part 77 surfaces in relation to the affected municipality. The municipality was also mailed a copy of an example airport zoning ordinance that could be adopted in order to make the municipality compliant with Act 164.

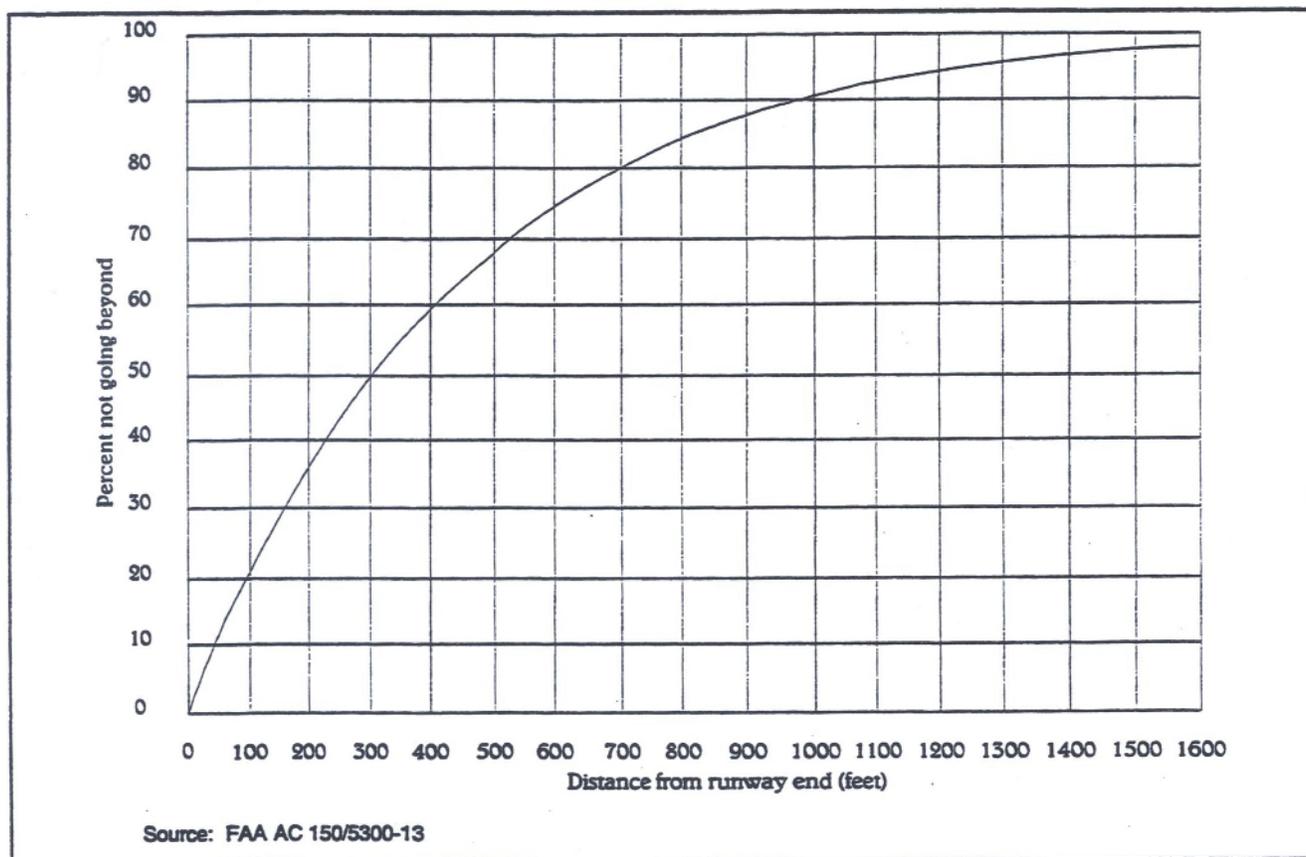


Exhibit 6 Approximate Distance Airplanes Undershoot & Overrun the Runway End

Since 1989, the bureau has undergone an extensive educational effort to help municipalities adopt height zoning regulations in relation to Act 164. Although many municipalities are now in compliance with Act 164, the Bureau recognizes the need to move beyond the height zoning regulations of Act 164 and to define appropriate land uses for surfaces in the airport environs. The Bureau of Aviation wants to continue to be an educational resource for municipalities affected by Act 164 and the Land use Compatibility Guidelines defined in this document.

To aid in the educational process, the Bureau has established these Land use Compatibility Guidelines for each of the public-use airports in the Commonwealth. These Land Use Compatibility guidelines use the Pat 77 surfaces as a basis to recommend underlying land uses. Municipalities should consider adopting these Guidelines as an overlay zone to existing municipal zoning districts. Areas recommended for control as part of the Land Use Compatibility Guidelines are defined in the following sections.

Land Use Guidelines

The Land Use Compatibility Guidelines for Pennsylvania are divided into four areas. Exhibit 8 shows the designation

for each area. The following land uses should be restricted in all areas.

- * Land uses with lights that shine upward around an airport and distract a pilot's vision.
- * Land uses that produce a glare or smoke that may distract a pilot.
- * Land uses generating electronic transmissions that may interfere with the aviation navigational signals and radio communications.
- * Land uses such as water impoundments, garbage dumps, sanitary landfills, or sewage treatment plants.
- * Land uses which attract large congregations of people or those that are noise sensitive.

1. *Area 1*

Area 1 consists of the land beneath the primary surface for each runway at the airport. The dimensions of this zone vary based on the length and width of the runway and the existing

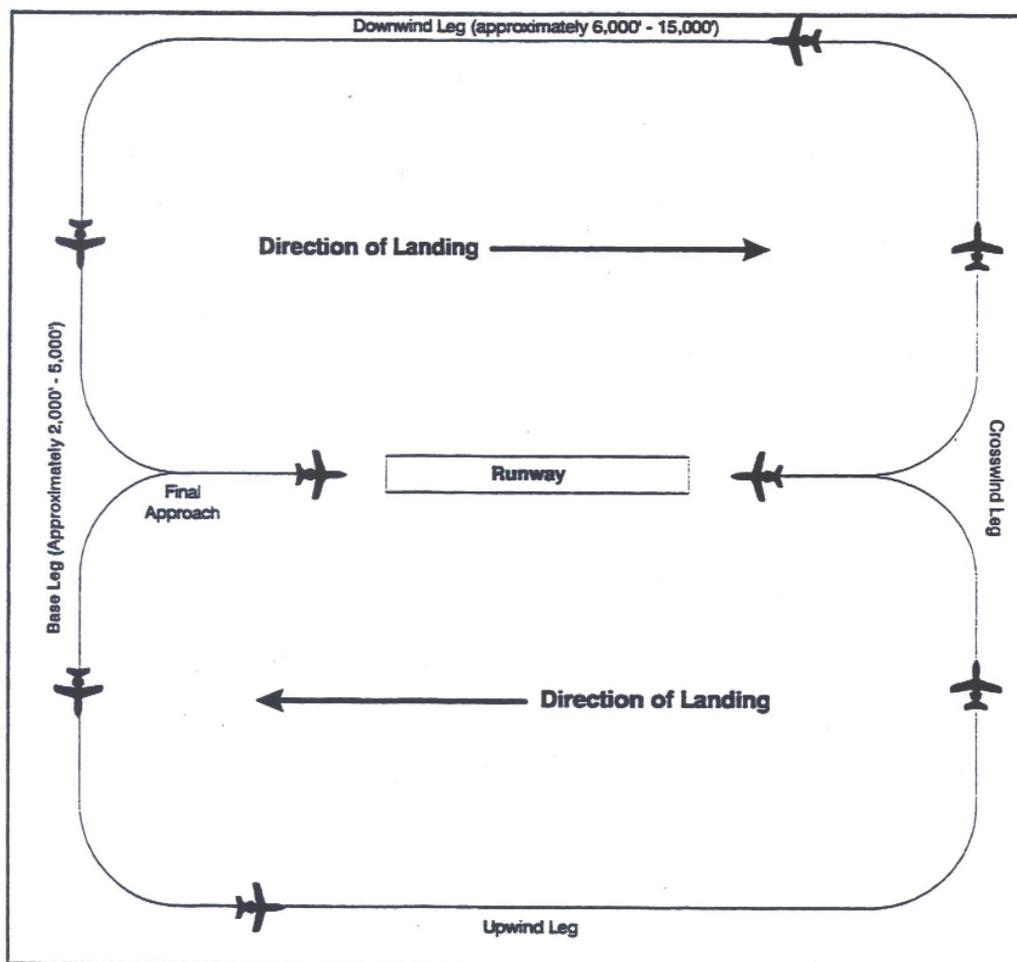


Exhibit 7 Typical Airport Traffic Pattern

or planned approach. Land in Area 1 should be owned by the Airport to insure control over land use. The following are permitted uses in Area 1 and are subject to the height requirements established by FAR Part 77.

- * Runway and taxiway system
- * Frangible navigational aids

2. **Area 2**

Area 2 consists of the land beneath the approach surface for each runway end extended 2,500 feet from the edge of the primary surface. This distance corresponds to the most demanding length for the RPZ. The primary surface begins at the end of a turf runway and 200 feet from the end of a paved runway. The land area closer to the runway end is also subject to the requirements found in the FAA Advisory Circular 150/5300-13, CHG4. "Design Standards". Safety Zones. Accordingly, fuel handling should not be permitted

In the RPZ nor should auto parking along the extended runway centerline with the RPZ.

The following are permitted uses in Area 2 and are subject to the height requirements established in FAR Part 77.

- * Agriculture
- * Passive Recreation (non-spectator)
- * Cemeteries
- * Automobile Parking
- * Transportation uses such as Railway and Street Right-of-Ways
- * Utilities

3. **Area 3**

Area 3 consists of the land beneath the transitional surface and the land beneath the approach surface from the end of Area 2 to the approach surface's intersection with the horizontal surface. The following are permitted uses in Area 3

and are subject to the height requirements established in FAR Part 77.

- * Agriculture
- * Passive Recreation (non-spectator)
- * Forestry
- * Resource Extraction - Mining
- * Manufacturing
- * Transportation uses such as Railway and Street Right-of-Ways
- * Utilities
- * Wholesale and Retail Trade such as; building materials, hardware, and general merchandise
- * Services excluding hospitals, nursing homes, educational, other medical facilities, and others noise sensitive uses

It is important to note that these land use recommendations for the approach and transitional surfaces are not based specifically on any established FAA criteria.

4. Area 4

Area 4 consists of the land beneath the horizontal surface. All land uses are permitted in Area 4 and are subject to the height requirements established in FAR Part 77.

Exhibit 9 identifies land uses which are generally compatible or incompatible within airport safety zones and Part 77 surfaces. There are specific types of development that are usually compatible with an airport. In general, these include agriculture, commercial, and industrial land uses. Other types of development, such as noise sensitive activities and places of public assembly are typically considered to be incompatible with an airport.

The information shown in Exhibit 9 corresponds to the land uses discussed in the previous subsections. For clarity purposes, Area 1 contains the primary surface. Area 2 contains the runway protection zone and the first 2,500 feet of the approach surface. Area 3 contains the transitional surface and the approach surface from the end of Area 2 to the approach surface's intersection with the horizontal surface. Area 4 contains the horizontal surface. Land use recommendations for the conical surface are consistent with height controls described in

FAR Part 77.

HOW CAN THE LAND USE COMPATIBILITY GUIDELINES BE IMPLEMENTED?

For those concerned with compatible land use in the airport environs, it is best to take steps to protect an airport before incompatible land use occurs or before obstructions are developed. Planners have a number of measures which they can consider when adopting land use controls for a particular airport. These measures can generally be grouped within three categories: planning, zoning, and acquisition. Whose controls can help prevent the encroachment of incompatible activities into areas around airports which should be protected.

Planning

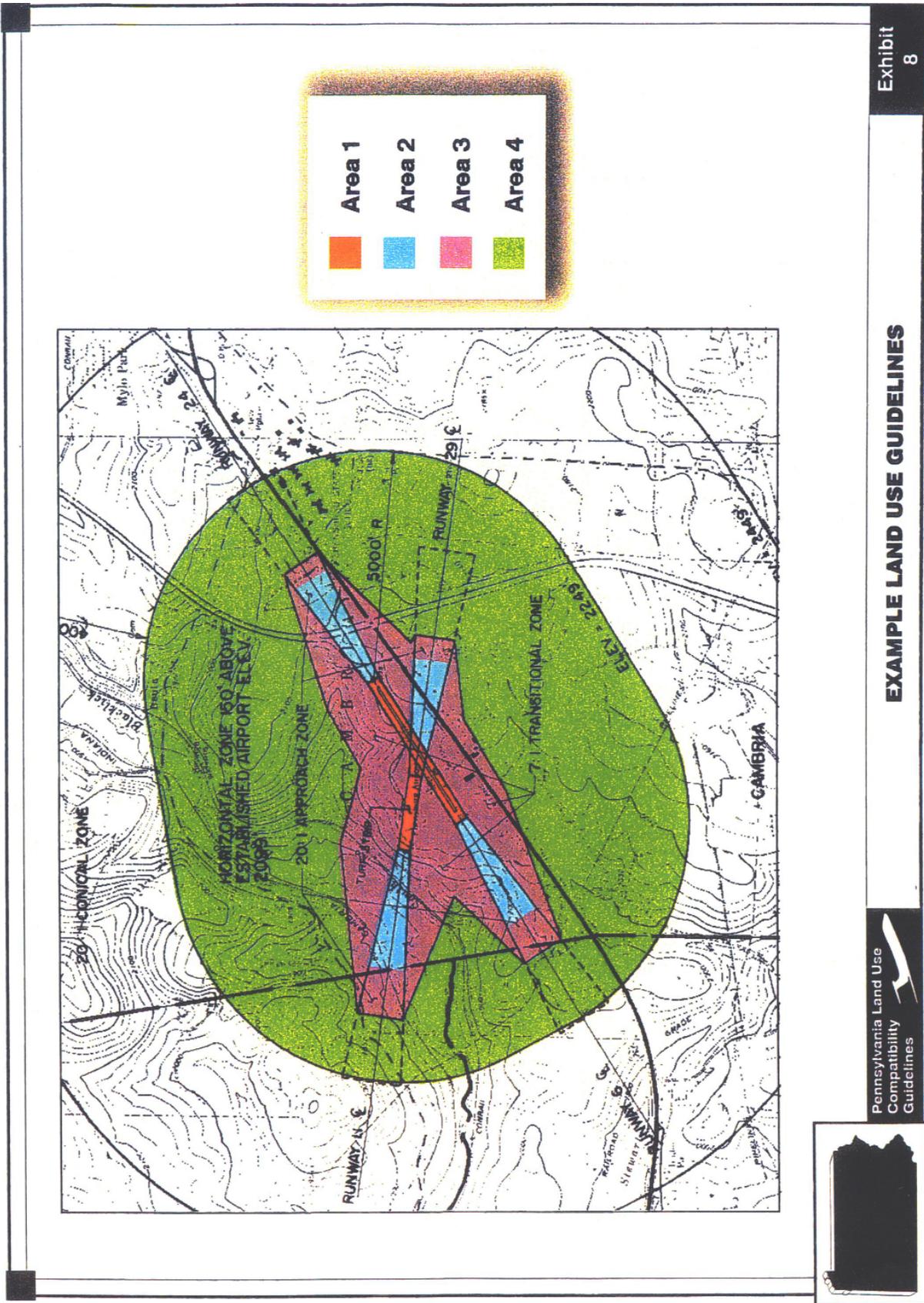
It is always best to take actions that will prevent incompatible land use, as opposed to taking action to correct such activities after the fact. The first step in implementing compatible land use for an airport is to incorporate these Guidelines as part of a municipal comprehensive plan and the airport's land use plan and map. Both of these tools are discussed in the following sections.

1. Comprehensive Plans

The Commonwealth of Pennsylvania does not require, but strongly recommends, its municipalities to prepare or adopt a comprehensive plan. Such plans are useful in establishing land use policies for the development and improvement of a community. Approximately 50 percent of the municipalities in the Commonwealth have comprehensive plans. The comprehensive plan is an especially useful tool to support compatible land uses in the airport environs. Comprehensive plans can also be used to develop criteria for reviewing future development proposals to ensure that overall goals and policies of the plans are maintained, while allowing flexibility to respond to changing circumstances.

Comprehensive plans exist at both the municipal and the county level in the Commonwealth. Generally speaking, the municipal comprehensive plan is more land use specific than the county comprehensive plan. Municipalities affected by the areas specified in these Guidelines should adopt these land use recommendations as part of their comprehensive plan. The county comprehensive plan should also identify compatible land use for the environs of all public-use-airports in that particular county.

Although the county comprehensive plan is a useful tool to direct development and growth on larger scale, the municipal comprehensive plan has more importance in establishing zoning policy. Since the FAR Part 77 surfaces overlap



LAND USES	Commonwealth of Pennsylvania Compatible Land Use Recommendations				
	Primary Surface	Transitional Surface	Horizontal Surface	Approach Surface	Runway Protection Zone
	Area 1	Area 3	Area 4	Area 2,3	Area 2
RESIDENTIAL					
Residential - other than mobile homes, transient lodgings	NC	NC	C	NC	NC
Mobile home parks/mobile homes	NC	NC	C	NC	NC
Transient lodgings	NC	NC	C	NC	NC
PUBLIC USE					
Places of public assembly (nursing homes, schools, hospitals, churches, auditoriums)	NC	NC	C	NC	NC
Governmental Buildings	NC	NC	C	NC	NC
Transportation (parking, highways, bus and rail terminals, aviation terminals)	NC	C	C	C ¹	* ¹
COMMERCIAL					
Offices - business and professional	NC	C	C	NC	NC
Wholesale/retail - materials, hardware and farm equipment	NC	C	C	NC	NC
Retail trade - general	NC	C	C	NC	NC
Utilities	NC	C	C	C ¹	* ¹
Communications (telephone exchange stations, relay towers, transmission stations)	NC	*	C	NC	NC
MANUFACTURING					
Manufacturing-general	NC	*	C	NC	NC
Agriculture (except livestock)	NC	C	C	C ¹	* ¹
Livestock farming and breeding	NC	C	C	C ¹	NC
Resource extraction (mining)	NC	NC	C	NC	NC
Forestry	NC	C	C	NC	NC
RECREATIONAL					
Outdoor sports arenas, amphitheaters	NC	NC	C	NC	NC
Nature exhibits, zoos	NC	NC	C	NC	NC
Amusement parks, resorts, camps	NC	NC	C	NC	NC
Golf courses	NC	C	C	C ¹	C ¹
Parks	NC	C	C	C ¹	C ¹

Note: These land uses do not reflect an FAA standard or guideline; compatible planning areas are based on FAR Part 77 and FAA Safety Zones.

¹These activities should be excluded from the OFA and RSA at all airports

KEY
 C - Generally compatible land use
 NC - Incompatible land use
 * - Not clearly compatible or incompatible, requires specific study

CRITERIA FOR COMPATIBILITY
 1. Does not exceed height standards.
 2. Does not attract large concentrations of people.
 3. Does not create a bird attractant.
 4. Does not cause a distracting light/glare.
 5. Does not cause a source of smoke.
 6. Does not cause an electrical interference.
 7. Does meet compatible DNL sound levels.

Pennsylvania Land Use
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**COMPATIBLE LAND USE
RECOMMENDATIONS**

EXHIBIT
9

municipal boundaries for most airports in the Commonwealth, it is important for the County Planning Commission to coordinate the adoption of these Land Use Compatibility Guidelines among all affected municipalities. Land Use Compatibility Guidelines presented in this document correspond to portions of the Part 77 surfaces for each airport, as previously defined in the Commonwealth's Airport Hazard Zoning Study. If coordinated planning does not occur, then land use incompatibilities will almost inevitably occur.

2. Adoption of an Airport Land Use Plan and Map

One strategy that can be used to assure airport land use compatibility is to adopt and implement an airport master plan, an airport land use plan and map may be done independently. An airport land use plan should address existing conditions, existing and future land use compatibility, actions to be taken, and the jurisdiction responsible for implementing the recommended actions. The airport land use plan should reflect the recommendations found in these Land use Compatibility Guidelines.

To implement this strategy, the airport land use plan must be incorporated into the local comprehensive plan or zoning ordinances, if they exist. This can be done through references in the comprehensive plan's goals or policies and by integrating the necessary considerations of airport conditions into the comprehensive land use plan. An airport land use plan can assist a municipality in outlining what areas need to be addressed by any future land use actions.

Zoning

Zoning is the most commonly used form of land use control. The purpose of zoning is to designate those areas of the municipality most suitable for particular land uses. The desired distribution of land uses in a comprehensive plan can become the basis for a zoning scheme. Land use zones, called districts, are shown on a map which is a required part of the zoning ordinance. The uses permitted in each district must be stated in the ordinance. Some permitted uses may be conditional, requiring a special permit.

A zoning ordinance can be adopted without a municipal comprehensive plan, but the comprehensive plan strengthens the zoning ordinance's validity. The primary advantage of zoning is that it can promote compatibility while leaving the land in question in private ownership, on the tax rolls, and in a mode to produce economically. At the same time, zoning is subject to change and must be periodically evaluated if it is to remain a viable land use compatibility tool. Used within its limitations, zoning is the pre-

ferred method for controlling land use to achieve airport-environs compatibility both for height and land use control.

Zoning controls need careful tailoring in order to satisfy both the characteristics of the airport and the special conditions affecting the municipality. It is important for on-airport property and off-airport property to be appropriately zones so that required airport development can occur. The land Use Compatibility guidelines described in this document can be adopted as an overlay zone and incorporated in a municipal zoning ordinance. The advantage of the overlay zone is that it maintains the existing zoning designation and places additional conditions on the activities and uses that can occur in the area beneath the overlay zone.

It is very important that zoning officers become familiar with the FAA's notification of proposed construction requirements found in FAR Part 77.13 and 77.15. These provisions outline the standards for review of development that may be an obstruction according to Part 77. The lack of enforcement of these standards can cause obstructions to navigation. If the zoning officer has questions about these provisions, they should contact the Airport District Office of the FAA for clarification.

Acquisition

Acquisition strategies for land use control and compatibility are most effective is they are used in the preventative mode. As a preventative strategy, acquisition techniques are generally less controversial and costly to implement. It is important to note, however, that acquisition strategies can also be employed as 'corrective' actions when incompatibilities already exist. Airport sponsors should consider acquisition strategies in this section as both preventative and corrective actions.

1. Land Purchase

Land purchase in fee simple by an airport is the most positive of all forms of land use control, but is it usually the most expensive. It is recommended by the FAA that airport proprietors own the property under the runway approach and departure areas, at least to the limits of their RPZs. (This area generally corresponds to Area 2 in these Guidelines.) Purchase of land within RPZs is eligible for funding through the FAA, if the airport is included in the National Plan of Integrated Airport Systems (NPIAS), or through the State matching grant option. It is preferable that local officials try to protect other land in the airport environs through comprehensive planning and zoning first, before outright purchasing, since the positive control method is less costly. On the other hand, variations of this method include land purchase with either resale for compatible use (land banking with restrictive covenants)

or use for a compatible public purpose. Under this scenario, costs may be effectively reduced.

2. Easements

An easement is a right of another to part of the total benefit of ownership of real property. Easements may be used as an effective and permanent form of land use control. Easements are permanent, with title held by the purchaser until sold or released, and work equally well in zoned municipalities or unzoned municipalities. Short of purchasing fee simple easements, property can be acquired by negotiation or condemnation. Easements permit the purchaser the use of another's property and property rights for the special purposes stated in the easement agreement. Avigation and hazard easements are those which grant:

- * The right of flight over the land in question

- * The right to remove existing obstructions
- * A restriction against the establishment of future obstruction
- * Compensation to the owner for the side effects of aircraft operations over the owner's property. This compensation can be used for home insulation, air conditioning, trees, and plants to help reduce overflight impacts.

The FAA defines four avigation and hazard easements. **Table 5** describes the rights acquired under each type of avigation and hazard easement. One major advantage of easements is that they can be permanent, whereas zoning can be changed. Additionally, easements often may be acquired for a fraction of the total value associated with the simple purchase of the land and are, thus, less expensive. Easements can be an effective strategy for assuring compatible development around airports. In the context of airport

TABLE 5	
BASIC TYPES OF AVIGATION AND HAZARD EASEMENTS	
Type of Avigation/Hazard Easement	Rights Acquired
Model Avigation and Hazard Easement	<ol style="list-style-type: none"> 1. Right-of-flight at any altitude above the approach surface. 2. Prevents any obstruction above approach surface. 3. Right to cause noise, vibrations, fumes, dust, and fuel particles. 4. Prohibits creation of electrical interference or unusual lighting. 5. Grants right-of-entry to remove trees, buildings, etc., above approach surface.
Limited Avigation Easement	<ol style="list-style-type: none"> 1. Right-of-flight above approach slope surface (20:1, 34:1, 50:1). 2. Prohibits any obstruction above approach slope surface. 3. Right-of-entry to remove any structure or growth above approach slope surface.
Clearance Easement	<ol style="list-style-type: none"> 1. Prohibits any structures, growths or obstructions above approach slope surface (20:1, 34:1, or 50:1). 2. Right-of-entry to remove, mark, or light any structures or growths above approach slope surface.
Runway Protection Zone Easement	<ol style="list-style-type: none"> 1. Prohibition of residences. 2. Prohibition of places of public assembly (churches, schools, hospitals, office buildings, shopping centers, and other similar activities).
Source: Federal Aviation Administration	

compatibility planning, easements may take several forms, such as a positive easement which allows the right of aviation and the right to make noise over someone's property, or a negative easement which prevents the creation or continuation of incompatible land uses on the property. **Exhibit 10** graphically depicts an aviation easement.

Acquisition of easements does not by and of itself change incompatible land use to compatible use or reduce the impact that airport operations have on the property, but the easement acquisition price can and should be dedicated to making the necessary change in use or providing soundproofing measures to achieve compatibility with the airport. Easements can be obtained in a number of ways including purchase, condemnation, and dedication (either voluntary or required at time of subdivision).

3. Transfer of Development Rights

Transfer of Development Rights (TDR) involves separate ownerships and the use of various "rights" associated with a parcel of land. Under the TDR concept, some of the property's development rights are transferred to an alternate location where they may be used to intensify allowable development. For example, land identified within the critical corridor of an extended runway approach could be kept in open space or agricultural use and its development rights for residential use transferred to locations outside the corridor. Landowners could be compensated for the transferred rights by selling the development rights at the new

location.

In order to be a viable option, the TDR approach must be fully coordinated with an overall planning and zoning process; this is best achieved through the use of planned zoning.

WHAT HAPPENS IF LAND USE INCOMPATIBILITIES ALREADY EXIST?

As noted, it is best to take preventative measures described so that incompatible land use does not become an issue in the airport environs. If, however, development has already occurred, there are corrective actions which can be taken by planners to resolve or at least mitigate the impact of incompatible land use on the airport's long-term operational efficiency. Corrective actions that can be considered fall into three general categories: Noise Mitigation, Operational Procedures, and Acquisition. It is important to note that acquisition strategies discussed in the previous section can be considered as corrective actions in applicable situations.

Noise Mitigation

Minimizing aircraft noise impacts on area around an airport once it has become developed is one corrective action that can be considered to achieve airport land use compatibility.

- * Noise Barriers
- * Soundproofing

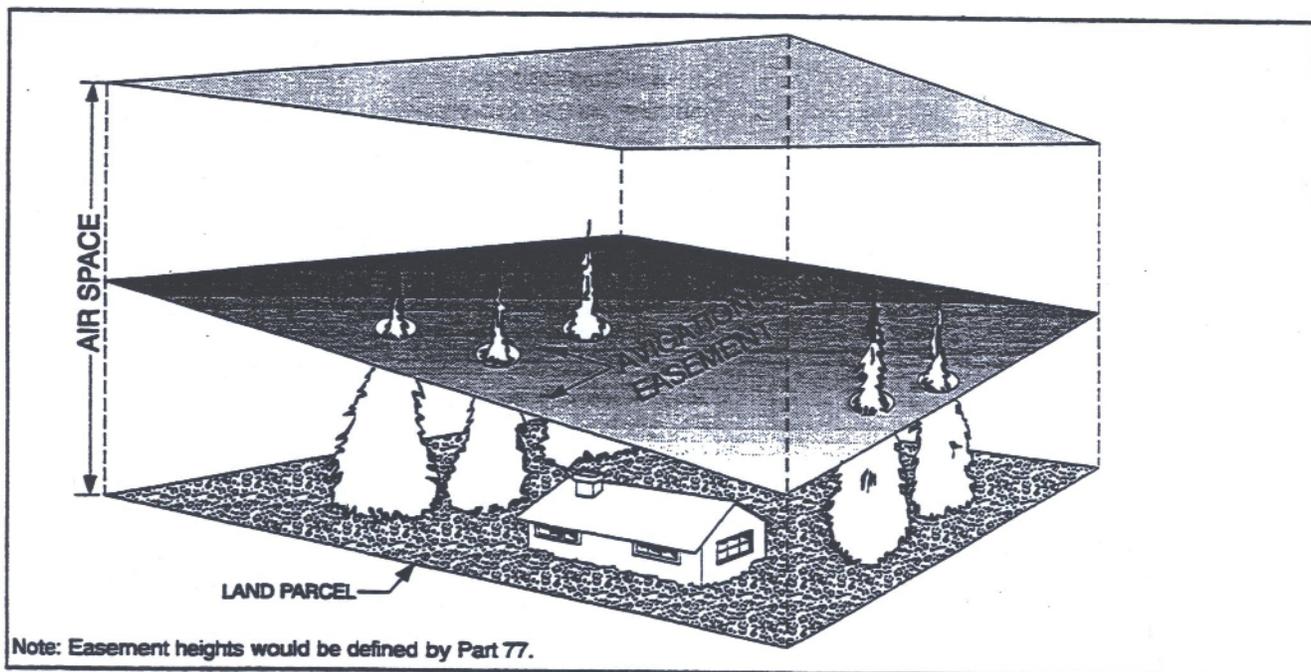


Exhibit 10 Area Controlled Under Aviation Easement

1. Noise Barriers

Noise barriers, or shielding, can reduce ground-level generated aircraft noise. Ground level noise sources at an airport include aircraft engine run-up areas, aircraft maintenance areas, and taxiways. The impact of ground level generated noise is usually confined to those areas immediately adjacent to the source. Noise barriers can be constructed through the strategic placement of new hangars, terminal structures, buildings, or tree and vegetative screens.

2. Soundproofing

Soundproofing is another control used to lessen noise within an airport's noise impact area. Although it is not an "exact science", eliminating noise through use of soundproofing can reduce interior noise between 10 and 30 decibels. Sound-proofing and insulation techniques may include double-glazed windows, acoustical doors, gasketing or enclosure doors, staggering or structural members ("isolated double membrane" building construction), and ceiling and wall insulation. Although soundproofing does not completely eliminate exterior noise effects within the home, it does reduce it to a more tolerable range.

While soundproofing is both a feasible and practical means of alleviating the impact of airport operation, particularly aircraft noise impact of airport operations, particularly aircraft noise impacts, the analysis of its usefulness (benefits vs. costs) should be made on a case-by-case basis giving careful consideration of the condition and age of the existing structure.

Operational Procedures

If development has already occurred in the airport environs, restricting aircraft operational procedures is another action that can be considered to minimize noise exposure patterns around an airport. Examples of possible operational procedures targeted to effect noise control may include, but are not limited to, the following:

- * Restrict ground movement of aircraft
- * Use preferential runway ends during calm winds
- * Restrict engine runups or use of ground equipment (identifying times of day and limiting locations)
- * Raise glide slope angle or intercept on PAPI or VASIs
- * Manage power and flap settings through pilot signage
- * Limit use of reverse thrust

- * Change traffic pattern altitudes or existing traffic legs in AFO materials

However, due to the limited size and types of aircraft operating at smaller general aviation airports in Pennsylvania, several of the strategies mentioned above are considered impractical for implementation. The first two items are considered feasible aircraft operational restrictions for implementation at small general aviation airports. The last item can be used at both smaller general aviation airports and larger commercial airports. It should be noted that while changing traffic patterns can decrease or eliminate noise impacts on one area, an increase in noise impacts may be experienced in another. The use of this type of noise control works effectively if the traffic pattern is changed to an airspace area over a compatible land use. Regarding all noise control options, it should be noted that altering standard airport/aircraft operational procedures can compromise safety. Any modifications or restrictions in standard operational procedures should only be considered after careful consideration of all other potentially feasible alternatives and after thorough consultation with affected parties (airport users) and the FAA. Changes such as those noted for operational strategies are best accomplished through an FAA approved Part 150 Noise Study. Most changes require FAA aeronautical study and review and/or coordination with the airlines or other pilot groups.

WHO SHOULD BE INVOLVED IN DEVELOPING LAND USE COMPATIBILITY GUIDELINES FOR AN AIRPORT?

As discussed previously, the airport sponsor has the responsibility of maintaining the level of service of an airport and for promoting land use compatibility when receiving Federal and State grant monies. However, the airport sponsor alone can not insure land use compatibility. There are usually many municipalities that are impacted by the FAR Part 77 surfaces of an airport. Bringing these municipalities together to promote airport compatible land use and to control the height of objects in the airport environs is challenging. This is especially true in Pennsylvania where there are over 2,500 municipalities that can adopt their own comprehensive plans and zoning ordinances. The airport sponsor should seek assistance when developing land use compatibility guidelines; agencies and their roles in adopting these Land Use Compatibility Guidelines are discussed in this section.

Airport Sponsor

The airport sponsor needs to maintain airport property so that there are no obstructions penetrating the FAR part 77

surfaces and/or the FAA Safety Zones. This is important to monitor since trees and other vegetation can grow and penetrate these surfaces. New construction at the airport needs to be compliant with FAR Part 77 and FAA Safety Zones. The Bureau of Aviation specialists can assist the airport sponsor in determining existing and potential obstructions.

The airport sponsor should check municipal comprehensive land use plans and land use controls within the FAR Part 77 surfaces of the airport. If the municipal zoning is not compatible with the Land Use Compatibility Guidelines, then the airport sponsor should inform the municipality. The sponsor may want to ask the Bureau of Aviation and the FAA to come to a municipal meeting to help educate elected officials on the importance of aviation in their community. The Bureau of Aviation and the FAA can help answer questions concerning land use compatibility guidelines.

When the airport is undergoing a master plan study of airport layout plan update, the municipalities in the airport environs need to be informed of any changes in runway length or navigational aids that would impact existing airport zoning. Likewise, airport officials need to play an active role when a municipality goes through the comprehensive planning and zoning process. Proposed land uses and zoning should be compatible with these Land Use Compatibility Guidelines.

Municipal Officials

Airport height zoning established by the FAA and the Commonwealth can be difficult to understand because of the three-dimensional nature of the FAR Part 77 surfaces. The Bureau of Aviation developed airport-specific FAR Part 77 surfaces in 1989 for all of the public-use airports in the Commonwealth. Surfaces have been updated as part of these Guidelines to reflect 1995 conditions. The Land Use Compatibility Guidelines presented in this document for the airport environs are based on surfaces established by Part 77 out to the edge of the horizontal surface.

Municipal officials need to determine what portion of their jurisdiction is impacted by the FAR Part 77 surfaces of an airport. (See Appendix A.) If airport height zoning is not in place, it should be adopted and enforced so that obstructions to the airport do not occur. The municipality should evaluate its zoning ordinance, if one exists, to determine if land use designations in the airport environs are compatible with these Guidelines.

The municipality can direct technical questions concerning FAR Part 77 surfaces and airport compatible land uses to the Bureau of Aviation and/or the FAA. The county planning commission is

also a useful resource to assist a municipality through the adoption of airport height zoning and/or these Land Use Compatibility Guidelines. For counties in the Pittsburgh and Philadelphia metropolitan areas, the Southwestern Pennsylvania Regional Planning Commission (SPRPC) and the Delaware Valley Regional Planning Commission (DVRPC), respectively, have staff that can provide further assistance on airport-related land use planning issues.

Each municipality within a FAR Part 77 surface needs to involve applicable airport officials in the community's comprehensive planning process and zoning ordinance adoption. Airport officials can inform the municipality of proposed improvements at the airport and be a resource in the comprehensive planning and zoning process. The dialogue established between the municipality and the airport is a valuable tool to promote a better understanding of the airport and the public's needs. This understanding translates to a greater possibility for implementing and enforcing these Land Use Compatibility Guidelines.

County Planning Commission

The county planning commission is a resource to municipalities who can provide technical assistance in comprehensive planning and zoning issues. Municipal officials and airport sponsors need to take advantage of the professional planning expertise provided by the county planning commission. The planning commission can play a crucial role in promoting land use compatibility by bringing the various municipalities within the FAR Part 77 surfaces together to adopt these Land Use Compatibility Guidelines and/or height zoning. Coordination of airport height zoning and land use compatibility among municipalities within each airport's Part 77 surfaces is important to insure that all of the land underlying the FAR Part 77 surfaces is protected. Planners need to evaluate municipal ordinances to determine if they are compliant with height zoning (Part 77) and the recommendations of these Land Use Compatibility Guidelines.

When a county planning commission is developing a county-wide comprehensive plan, airport sponsors should provide input into the land use and transportation plan elements. Goal and vision statements for the comprehensive plan need to encourage the operation and development of the Commonwealth's airports.

Bureau of Aviation

The Bureau of Aviation provides various resources, including education, to municipal officials and airport sponsors concerning height zoning and land use compatibility. Every public-use airport in the Commonwealth is inspected and

notified by the Bureau of Aviation concerning the presence of obstructions in the airport's FAR Part 77 surfaces. The Bureau of Aviation is available to work with municipalities that wish to implement height zoning and compatible land use guidelines.

The Bureau of Aviation recently established a process to prioritize its distribution of State grant money. During the grant application process, proposed projects are prioritized to determine their importance. This rating helps the Bureau to determine how to allocate available State funding. One of the criteria used to prioritize projects is the presence of airport hazard zoning in the airport environs; this priority rating criterion may now be expanded to include adoption of these Land Use Guidelines. If the airport has height zoning and land use guidelines in place in all affected municipalities, the proposed project receives a higher rating and an increased likelihood of funding.

WHEN SHOULD EXISTING HEIGHT OF LAND USE CONTROLS IN THE AIRPORT ENVIRONS BE UPDATED?

If municipalities within the airport environs (as defined by the FAR Part 77 surfaces) have airport zoning or other land use controls that are in compliance with State and Federal guidelines, then it is important to monitor proposed development around the airport to insure that regulations are enforced.

Airport zoning and land use controls should be reevaluated during the municipal comprehensive planning process and airport master planning process. Any development proposed within the Part 77 surfaces of a public-use airport in Pennsylvania should be subject to a public review process. This is especially important in the airport master planning process because changes in runway length, upgraded navigational aids, or additional runways change the dimensions of the FAR Part 77 surfaces. Proposed changes to runway characteristics need to be carefully coordinated with affected municipalities in order to insure that revisions are made to municipal ordinances and FAR Part 77 surfaces and to ensure that the land underlying these surfaces continues to be protected.

During the municipal comprehensive planning process, it is important for municipal officials to consult with the airport manager/owner. The municipal comprehensive planning process is also a tool to reaffirm the airport's role in the municipality through the planning goals and objectives that are established.

WHAT ARE THE NEXT STEPS FOR THE AIRPORT?

The airport and impacted municipalities should consider appropriate land use/zoning controls prior to the development of land near their airport. Adequate safeguards should be incorporated to prevent incompatible land uses or height obstructions from occurring in proximity to the boundaries of the airport. Adequate control can provide space for future airport expansion. Specific efforts that airport sponsors can undertake to control and monitor land use compatibility around their airport are described below:

- * Ensure these Land Use Compatibility Guidelines for all surrounding municipalities are in place and that these Guidelines reflect current Part 77 surfaces.
- * Assist surrounding municipalities in understanding how the airport operates, the airport's flight patterns, and the type of aircraft operating at the airport. Also assist surrounding municipalities in understanding how the airport benefits the local economy and community's health, welfare, and safety.
- * Stay involved because land use is fluid and subject to a public process that is constantly changing. By staying involved, the airport can influence the compatibility of land and related development surrounding the airport.
- * Be aware of land use actions proposed by the county and all individual municipalities in the airport environs.
- * Assist local municipalities in understanding Federal Aviation Regulations Part 77 notification requirements and the special needs for protecting the safety and efficiency of airports operations. These Land use Compatibility Guidelines contain specific information which can be drawn upon to fulfill this requirement.
- * Make sure the Airport layout Plan (ALP) is up to date so that it reflects current aircraft usage relating to the critical aircraft, all current on-airport facilities, all aviation easements and fee simple property, desired development within the planning period, and current information on land use and land use controls.
- * Provide copies of the Airport Layout Plan (ALP) to the local and county planning commission; make sure copies of Part 77 surfaces on file with area planners are current.

- * Attend planning meetings on land use and development issues in the vicinity of the airport.
- * Invite local government officials and planners to be part of the airport advisory committee to keep them informed of the airport's plans and needs.

These Guidelines offer the airport sponsor an opportunity to establish or strengthen their relationship with local municipal officials, to show them the issues associated with airport land use compatibility and to explain how the airport and the municipality can most rationally be protected. By staying involved in local land use issues and local comprehensive plans, airport sponsors can ensure that their airport's needs are brought to the attention of the local municipalities who have the authority to control surrounding land use through zoning or other controls.

HOW DOES THE MUNICIPALITY BEGIN TO IMPLEMENT THESE GUIDELINES?

There are several questions that municipalities should answer when they consider how to address land use planning for the airport or airports within their jurisdiction. These questions include:

- * Does your municipality have existing height zoning which is compliant with Act 164?
- * If you have a comprehensive plan, does it have a transportation element that promotes the operation and development of the airport?
- * Is an airport representative involved in the local planning process, especially when concerns arise regarding air transportation and land uses surrounding the airport?
- * Is your agency involved in planning that takes place at the airport?
- * Does your agency have land use controls in place to prevent development of incompatible uses in the airport's environs that reflect the recommendations of these guidelines?
- * Is your agency involved in steps to resolve existing compatibility problems in the airport's environs?

- * Is your municipality coordinating with other adjacent municipalities affected by the airport?

By answering these questions, municipalities can determine their needs as they relate to land use in the airport environs. Exhibit 11 provides an overview of the process to follow to initiate compatible land use planning in the airport environs.

The Guidelines provide a logical sequence of activities for each municipality and airport to examine land use compatibility in the airport environs. It is up to the local municipality to actually determine and identify where existing incompatible land uses have developed in the airport environs. Within the context of these Guidelines, each municipality which has zoning or land use planning responsibilities for an airport should use this information to resolve existing incompatible land uses within the airport's area of influence and to implement actions which will prevent future incompatible development from occurring.

By adopting the Guidelines presented in this document, land use controls can be implemented which will preserve the investment in the airport's infrastructure, the economic contribution made by the airport's operations, and the safety of the public.

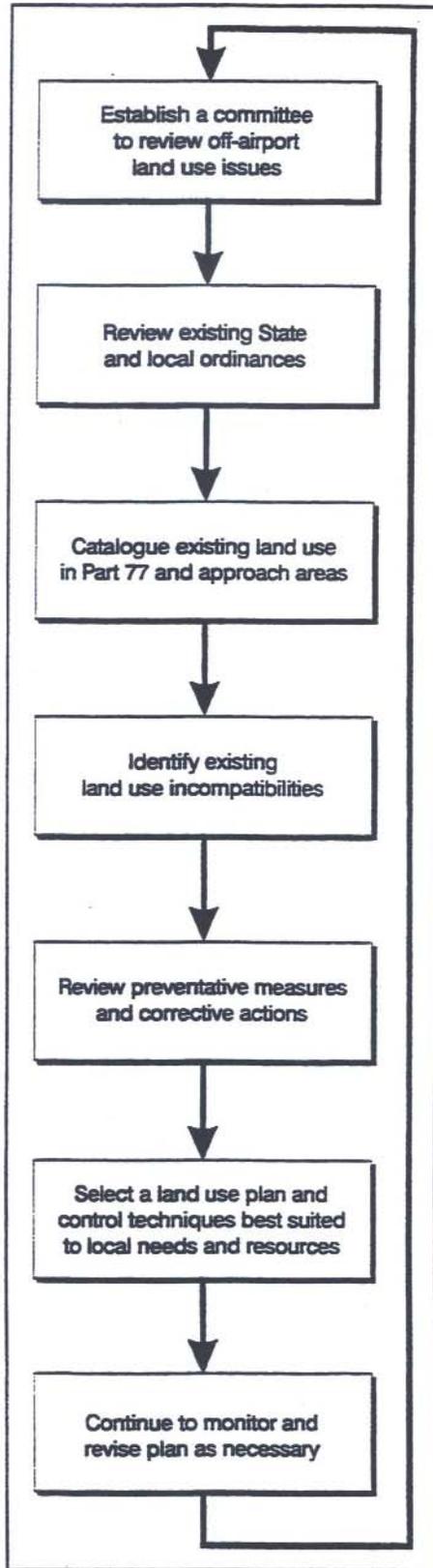


Exhibit 11 Planning for Compatible Land Use Around Airports

This work was sponsored by the Pennsylvania Department of Transportation, Bureau of Aviation. The contents of this report reflect the views of the authors, who are responsible for the facts and the accuracy of the data presented herein. The contents do not necessarily reflect the official views or policies of the Commonwealth of Pennsylvania. This report does not constitute a standard, specification, or regulation.

Additional copies of these Guidelines can be obtained from the Pennsylvania Department of Transportation Bureau of Aviation, 208 Airport Drive, Middletown, PA, 17057, (717) 948-3901.

Appendix A

Airports and Municipalities Affected by FAR Part 77 Surfaces

AIRPORT NAME	MUNICIPAL NAME	COUNTY NAME	AIRPORT NAME	MUNICIPAL NAME	COUNTY NAME
ALBERT AIRPORT	WALLACETON	CLEARFIELD	BLOOMSBURG MUNICIPAL AIRPORT	BLOOMSBURG	COLUMBIA
	BRADFORD	CLEARFIELD		MAIN	COLUMBIA
	BOGGS	CLEARFIELD		CATAWISSA	COLUMBIA
	GRAHAM	CLEARFIELD		HEMLOCK	COLUMBIA
	MORRIS	CLEARFIELD		MT PLEASANT	COLUMBIA
ALLEGHENY COUNTY AIRPORT	WEST HOMESTEAD	ALLEGHENY	CATAWISSA	COLUMBIA	
	WEST MIFFLIN	ALLEGHENY	SCOTT	COLUMBIA	
	WHITEHALL	ALLEGHENY	MONTOUR	COLUMBIA	
	JEFFERSON HILLS	ALLEGHENY	BLUE KNOB VALLEY AIRPORT	JUNIATA	BLAIR
	MUNHALL	ALLEGHENY	FREEDOM	BLAIR	
	PLEASANT HILLS	ALLEGHENY	DUNCANSVILLE	BLAIR	
	PORT VUE	ALLEGHENY	NEWRY	BLAIR	
	CLAIRTON	ALLEGHENY	HOLLIDAYSBURG	BLAIR	
	PITTSBURGH	ALLEGHENY	BLAIR	BLAIR	
	BALDWIN	ALLEGHENY	ALLEGHENY	BLAIR	
	MCKEESPORT	ALLEGHENY	BLUE SWAN AIRPORT	SAYRE	BRADFORD
	DRAVOSBURG	ALLEGHENY	SOUTH WAVERLY	BRADFORD	
	BRENTWOOD	ALLEGHENY	ATHENS	BRADFORD	
	GLASSPORT	ALLEGHENY	ATHENS	BRADFORD	
	ALTOONA-BLAIR COUNTY AIRPORT	WOODBURY	BEDFORD	BRADFORD COUNTY AIRPORT	MONROE
	NORTH WOODBURY	BLAIR	TOWANDA	BRADFORD	
	HUSTON	BLAIR	ASYLUM	BRADFORD	
	TAYLOR	BLAIR	MONROE	BRADFORD	
	MARTINSBURG	BLAIR	WYSOX	BRADFORD	
BANDEL AIRPORT	SOUTH STRABANE	WASHINGTON	NORTH TOWANDA	BRADFORD	
	SOMERSET	WASHINGTON	TOWANDA	BRADFORD	
	NORTH BETHLEHEM	WASHINGTON	KEATING	MCKEAN	
	COKEBURG	WASHINGTON	HAMLIN	MCKEAN	
	AMWELL	WASHINGTON	LAFAYETTE	MCKEAN	
BAUBLITZ AIRPORT	LOWER CHANCEFORD	YORK	BRANDYWINE AIRPORT	WEST CHESTER	CHESTER
	EAST HOPEWELL	YORK	EAST GOSHEN	CHESTER	
	CHANCEFORD	YORK	WEST GOSHEN	CHESTER	
	NORTH HOPEWELL	YORK	WILLISTOWN	CHESTER	
BEAVER COUNTY AIRPORT	PATTERSON	BEAVER	WEST WHITELAND	CHESTER	
	SOUTH BEAVER	BEAVER	EAST BRADFORD	CHESTER	
	BIG BEAVER	BEAVER	EAST WHITELAND	CHESTER	
	CHIPPEWA	BEAVER	WESTTOWN	CHESTER	
	DARLINGTON	BEAVER	BROKENSTRAW AIRPORT	DEERFIELD	WARREN
	DARLINGTON	BEAVER	BROKENSTRAW	WARREN	
	WHITE	BEAVER	YOUNGSVILLE	WARREN	
	WEST MAYFIELD	BEAVER	PITTSFIELD	WARREN	
	BEDFORD COUNTY AIRPORT	BEDFORD	BEDFORD	BUEHL FIELD	NORTHAMPTON
	EAST ST CLAIR	BEDFORD	LANGHORNE	BUCKS	
	NAPIER	BEDFORD	LANGHORNE MANOR	BUCKS	
BELLEFONTE AIRPORT	BOGGS	CENTRE	PENNDDEL	BUCKS	
	BELLEFONTE	CENTRE	NEWTOWN	BUCKS	
	UNION	CENTRE	BRISTOL	BUCKS	
	SPRING	CENTRE	NEWTOWN	BUCKS	
	BENNER	CENTRE	BENSALEM	BUCKS	
	COLLEGE	CENTRE	MIDDLETOWN	BUCKS	
BELTZVILLE AIRPORT	PARRYVILLE	CARBON	LOWER MAKEFIELD	BUCKS	
	LOWER TOWAMENSING	CARBON	FALLS	BUCKS	
	BOWMANSTOWN	CARBON	HULMEVILLE	BUCKS	
	EAST PENN	CARBON	BUTLER COUNTY AIRPORT	CONNOQUENESSING	BUTLER
	PENN FOREST	CARBON	ADAMS	BUTLER	
	TOWAMENSING	CARBON	BUTLER	BUTLER	
	MAHONING	CARBON	FORWARD	BUTLER	
	PALMERTON	CARBON	MIDDLESEX	BUTLER	
BENDIGO AIRPORT	FRANKLIN	CARBON	PENN	BUTLER	
	JEFFERSON	DAUPHIN	BUTLER FARM SHOW AIRPORT	CONNOQUENESSING	BUTLER
	WILLIAMS	DAUPHIN	CENTER	BUTLER	
	RUSH	DAUPHIN	BUTLER	BUTLER	
	WILLIAMSTOWN	DAUPHIN	FORWARD	BUTLER	
	JACKSON	DAUPHIN	FRANKLIN	BUTLER	
	COLD SPRING	LEBANON	CONNOQUENESSING	BUTLER	
	UNION	LEBANON	PENN	BUTLER	
	TOWER CITY	SCHUYLKILL	BUTTER VALLEY GOLF PORT	HEREFORD	BERKS
	PINE GROVE	SCHUYLKILL	WASHINGTON	BERKS	
PORTER	SCHUYLKILL	BALLY	BERKS		

BERMUDIAN VALLEY AIRPARK	TREMONT	SCHUYLKILL		EAST GREENVILLE	MONTGOMERY
	READING	ADAMS		UPPER HANOVER	MONTGOMERY
	LATIMORE	ADAMS		DOUGLASS	MONTGOMERY
	FRANKLIN	YORK		NEW HANOVER	MONTGOMERY
	WASHINGTON	YORK		PENNSBURG	MONTGOMERY
	WARRINGTON	YORK			
CAPITAL CITY AIRPORT	LEMOYNE	CUMBERLAND	CULMERVILLE AIRPORT	WEST DEER	ALLEGHENY
	NEW CUMBERLAND	CUMBERLAND		FAWN	ALLEGHENY
	LOWER ALLEN	CUMBERLAND		FRAZER	ALLEGHENY
	HARRISBURG	DAUPHIN		MIDDLESEX	BUTLER
	STEELTON	DAUPHIN	DANVILLE AIRPORT	CLINTON	BUTLER
	HIGHSPIRE	DAUPHIN		DANVILLE	MONTOUR
	PAXTANG	DAUPHIN		VALLEY	MONTOUR
	SWATARA	DAUPHIN		LIBERTY	MONTOUR
	LOWER SWATARA	DAUPHIN	MAHONING	MONTOUR	
CARLISLE AIRPORT	FAIRVIEW	YORK		RIVERSIDE	NORTHUMBERLAND
	CARLISLE	CUMBERLAND		RUSH	NORTHUMBERLAND
	SOUTH MIDDLETON	CUMBERLAND		POINT	NORTHUMBERLAND
	NORTH MIDDLETON	CUMBERLAND	DECK AIRPORT	JACKSON	LEBANON
	MIDDLESEX	CUMBERLAND		MILLCREEK	LEBANON
CENTRE AIRPARK AIRPORT	GREGG	CENTRE		HEIDELBERG	LEBANON
	POTTER	CENTRE		MYERSTOWN	LEBANON
CHAMBERSBURG MUNICIPAL AIRPORT	CENTRE HALL	CENTRE		SOUTH LEBANON	LEBANON
	HAMILTON	FRANKLIN	DOERSOM AIRPORT	NORTH LEBANON	LEBANON
	CHAMBERSBURG	FRANKLIN		STRABAN	ADAMS
	LETTERKENNY	FRANKLIN		BUTLER	ADAMS
GUILFORD	FRANKLIN	FRANKLIN		ADAMS	
	GREENE	FRANKLIN	FREEDOM	ADAMS	
CHERRY RIDGE AIRPORT	TEXAS	WAYNE		HIGHLAND	ADAMS
	CHERRY RIDGE	WAYNE		GETTYSBURG	ADAMS
	PALMYRA	WAYNE		CUMBERLAND	ADAMS
	HONESDALE	WAYNE	DONEGAL SPRINGS AIRPORT	MT JOY	LANCASTER
	PAUPACK	WAYNE		MARIETTA	LANCASTER
CHERRY SPRINGS AIRPORT	WEST BRANCH	POTTER		CONOY	LANCASTER
	SUMMIT	POTTER		MOUNT JOY	LANCASTER
	WHARTON	POTTER		RAPHO	LANCASTER
CHESTER CO.-G.O. CARLSON AIRPORT	ABBOTT	POTTER		EAST DONEGAL	LANCASTER
	SOUTH COATESVILLE	CHESTER		WEST DONEGAL	LANCASTER
	WEST BRANDYWINE	CHESTER	DOYLESTOWN AIRPORT	HELLAM	YORK
	VALLEY	CHESTER		NEW BRITAIN	BUCKS
	WEST CALN	CHESTER		BUCKINGHAM	BUCKS
	PARKESBURG	CHESTER		DOYLESTOWN	BUCKS
		COATESVILLE	CHESTER	PLUMSTEAD	BUCKS
		HIGHLAND	CHESTER	NEW BRITAIN	BUCKS
	EAST FALLOWFIELD	CHESTER	DOYLESTOWN	BUCKS	
	SADSBURY	CHESTER	WASHINGTON	JEFFERSON	
CHIM AIRPORT	SAINT CLAIR	SCHUYLKILL	DUBOIS-JEFFERSON COUNTY AIRPORT	WARSAW	JEFFERSON
	NORWEGIAN	SCHUYLKILL		PINE CREEK	JEFFERSON
	EAST NORWEGIAN	SCHUYLKILL		WINSLOW	JEFFERSON
	MINERSVILLE	SCHUYLKILL		MIDDLE SMITHFIELD	MONROE
	CASS	SCHUYLKILL		BARRETT	MONROE
	POTTSVILLE	SCHUYLKILL	PRICE	MONROE	
	BRANCH	SCHUYLKILL	PORTER	PIKE	
CLARION COUNTY AIRPORT	NEW CASTLE	SCHUYLKILL	EASTON AIRPORT	STOCKERTOWN	NORTHAMPTON
	BEAVER	CLARION		TATAMY	NORTHAMPTON
	CLARION	CLARION		NAZARETH	NORTHAMPTON
	ELK	CLARION		FORKS	NORTHAMPTON
	PINEY	CLARION		EASTON	NORTHAMPTON
	HIGHLAND	CLARION		BUSHKILL	NORTHAMPTON
	SHIPPENVILLE	CLARION		LOWER NAZARETH	NORTHAMPTON
	PAINT	CLARION		LOWER MT BETHEL	NORTHAMPTON
	MONROE	CLARION		PLAINFIELD	NORTHAMPTON
		CLARION		CLARION	WILSON
CLEARFIELD LAWRENCE AIRPORT	CLEARFIELD	CLEARFIELD		UPPER NAZARETH	NORTHAMPTON
	GOSHEN	CLEARFIELD	EBENSBURG AIRPORT	PALMER	NORTHAMPTON
	BRADFORD	CLEARFIELD		JACKSON	CAMBRIA
LAWRENCE	CLEARFIELD	NANTY GLO		CAMBRIA	
CONNELLSVILLE AIRPORT	DUNBAR	FAYETTE		CROYLE	CAMBRIA
	FRANKLIN	FAYETTE		EBENSBURG	CAMBRIA
	DUNBAR	FAYETTE		SUMMERHILL	CAMBRIA
	NORTH UNION	FAYETTE		CAMBRIA	CAMBRIA
CORRY LAWRENCE AIRPORT	CONCORD	ERIE	ERIE COUNTY AIRPORT	CAMBRIA	CAMBRIA
	CORRY	ERIE		BLACKLICK	CAMBRIA
	WAYNE	ERIE		VENANGO	ERIE
	SPRING CREEK	WARREN		GREENE	ERIE
	COLUMBUS	WARREN		GREENFIELD	ERIE

Airport Land Use Compatibility Guidelines

March 1996

ERIE INTERNATIONAL AIRPORT	MILLCREEK	ERIE	HARRISBURG INTERNATIONAL AIRPORT	LONDONDERRY	DAUPHIN
	FAIRVIEW	ERIE		STEELETON	DAUPHIN
	ERIE	ERIE		HIGHSPIRE	DAUPHIN
FARMERS PRIDE AIRPORT	BETHEL	BERKS	HAZLETON MUNICIPAL AIRPORT	MIDDLETOWN	DAUPHIN
	SWATARA	LEBANON		ROYALTON	DAUPHIN
	JONESTOWN	LEBANON		SWATARA	DAUPHIN
	UNION	LEBANON		LOWER SWATARA	DAUPHIN
	BETHEL	LEBANON		NEWBERRY	YORK
FINLEYVILLE AIRPARK	JEFFERSON HILLS	ALLEGHENY	HORSHAM VALLEY AIRWAYS HELIPORT	FAIRVIEW	YORK
	FORWARD	ALLEGHENY		GOLDSBORO	YORK
	SOUTH PARK	ALLEGHENY		WEST HAZLETON	LUZERNE
	PETERS	WASHINGTON		HAZLETON	LUZERNE
	CARROLL	WASHINGTON		HAZLE	LUZERNE
	UNION	WASHINGTON		BUTLER	LUZERNE
	NOTTINGHAM	WASHINGTON		CONYNGHAM	LUZERNE
FINLEYVILLE	WASHINGTON	SUGARLOAF	LUZERNE		
FLYING DOLLAR AIRPORT	BARRETT	MONROE	HUNTINGDON COUNTY AIRPORT	WARRINGTON	BUCKS
	GREENE	PIKE		LOWER GWYNEDD	MONTGOMERY
FLYING M AERODROME	EAST PENN	CARBON	ICKES ULTRALIGHT AIRPORT	UPPER DUBLIN	MONTGOMERY
	LYNN	LEHIGH		MONTGOMERY	MONTGOMERY
	HEIDELBERG	LEHIGH		HORSHAM	MONTGOMERY
	WASHINGTON	LEHIGH		SHIRLEY	HUNTINGDON
GRAND CANYON AIRPORT	WEST PENN	SCHUYLKILL	INDIAN LAKE AIRPORT	SHIRLEYSBURG	HUNTINGDON
	SHIPPEN	TIOGA		CROMWELL	HUNTINGDON
	DELMAR	TIOGA		WEST ST CLAIR	BEDFORD
GREENE COUNTY AIRPORT	JEFFERSON	GREENE	INDIANA COUNTY/JIMMY STEWART APT	EAST ST CLAIR	BEDFORD
	GREENE	GREENE		KING	BEDFORD
	MORGAN	GREENE		LINCOLN	BEDFORD
	WHITELEY	GREENE		PLEASANTVILLE	BEDFORD
	WAYNESBURG	GREENE		INDIAN LAKE	SOMERSET
GREENSBURG JEANNETTE REG. AIRPORT	FRANKLIN	GREENE	INTER COUNTY AIRPORT	SHADE	SOMERSET
	PENN	WESTMORELAND		STONYCREEK	SOMERSET
	JEANNETTE	WESTMORELAND		RAYNE	INDIANA
	DELMONT	WESTMORELAND		BRUSH VALLEY	INDIANA
	MURRYSVILLE	WESTMORELAND		INDIANA	INDIANA
	EXPORT	WESTMORELAND		WHITE	INDIANA
GREENVILLE MUNICIPAL AIRPORT	MANOR	WESTMORELAND	JAKE ARNER MEMORIAL AIRPORT	CHERRYHILL	INDIANA
	SALEM	WESTMORELAND		VERSAILLES	ALLEGHENY
	HEMPFIELD	WESTMORELAND		WHITE OAK	ALLEGHENY
	WEST FALLOWFIELD	CRAWFORD		NORTH VERSAILLES	ALLEGHENY
	SOUTH SHENANGO	CRAWFORD		SOUTH VERSAILLES	ALLEGHENY
	GREENVILLE	MERCER		MCKEESPORT	ALLEGHENY
	JAMESTOWN	MERCER		ELIZABETH	ALLEGHENY
	GREENE	MERCER		TRAFFORD	ALLEGHENY
	SUGAR GROVE	MERCER		NORTH HUNTINGDON	WESTMORELAND
	WEST SALEM	MERCER		TRAFFORD	WESTMORELAND
GRIMES AIRPORT	HEMPFIELD	MERCER	JERSEY SHORE AIRPORT	EAST PENN	CARBON
	BETHEL	BERKS		LEHIGHTON	CARBON
	UPPER TULPEHOCKEN	BERKS		MAHONING	CARBON
	TULPEHOCKEN	BERKS		SUMMIT HILL	CARBON
GROVE CITY AIRPORT	WAYNE	SCHUYLKILL	JOHNSTOWN-CAMBRIA COUNTY APT	JIM THORPE	CARBON
	WASHINGTON	SCHUYLKILL		BASTRESS	LYCOMING
	PLAIN GROVE	LAWRENCE		LIMESTONE	LYCOMING
	WASHINGTON	LAWRENCE		PIATT	LYCOMING
	LIBERTY	MERCER		NIPPENOSE	LYCOMING
	GROVE CITY	MERCER		PORTER	LYCOMING
	SPRINGFIELD	MERCER		JERSEY SHORE	LYCOMING
	FINDLEY	MERCER		WOODWARD	LYCOMING
PINE	MERCER	SUSQUEHANNA	LYCOMING		
GWIN AIRPORT	BESSEMER	LAWRENCE	JOHNSTOWN	MIFFLIN	LYCOMING
	S.N.P.J.	LAWRENCE		WATSON	LYCOMING
	NORTH BEAVER	LAWRENCE		FRANKLIN	CAMBRIA
HANOVER AIRPORT	MAHONING	LAWRENCE	STONYCREEK	GEISTOWN	CAMBRIA
	BERWICK	ADAMS		EAST TAYLOR	CAMBRIA
	MOUNT PLEASANT	ADAMS		RICHLAND	CAMBRIA
	OXFORD	ADAMS		CONEMAUGH	CAMBRIA
	MCSHERRYSTOWN	ADAMS		JOHNSTOWN	CAMBRIA
	UNION	ADAMS		ADAMS	CAMBRIA
	CONEWAGO	ADAMS			CAMBRIA
	HANOVER	YORK			CAMBRIA
	PENN	YORK			CAMBRIA
	WEST MANHEIM	YORK			CAMBRIA

KELLER BROTHERS AIRPORT	ELIZABETH	LANCASTER	KAMPEL AIRPORT	CARROLL	YORK
	JACKSON	LEBANON		FRANKLIN	YORK
	HEIDELBERG	LEBANON		WASHINGTON	YORK
	CORNWALL	LEBANON		WARRINGTON	YORK
KEYSTONE GLIDERPORT	SOUTH LEBANON	LEBANON		WELLSVILLE	YORK
	HUSTON	CENTRE	MID STATE AIRPORT	FRANKLINTOWN	YORK
	PATTON	CENTRE		RUSH	CENTRE
	UNIONVILLE	CENTRE		HUSTON	CENTRE
UNION	CENTRE	WORTH		CENTRE	
KEYSTONE HELIPORT	BENNER	CENTRE	MIFFLIN COUNTY AIRPORT	JACKSON	HUNTINGDON
	EAST GOSHEN	CHESTER		BROWN	MIFFLIN
	WEST GOSHEN	CHESTER		ARMAGH	MIFFLIN
	WILLISTOWN	CHESTER		DERRY	MIFFLIN
KUTZTOWN AIRPORT	WEST WHITELAND	CHESTER	MIFFLINTOWN AIRPORT	GRANVILLE	MIFFLIN
	WEST PIKELAND	CHESTER		MILFORD	JUNIATA
	EAST WHITELAND	CHESTER		WALKER	JUNIATA
	UWCHLAN	CHESTER		FERMANAGH	JUNIATA
LAKEHILL AIRPORT	CHARLESTOWN	CHESTER		MIFFLIN	JUNIATA
	MAXATAWNY	BERKS	MILLARD AIRPORT	MIFFLINTOWN	JUNIATA
	ROCKLAND	BERKS		DECATUR	MIFFLIN
	GREENWICH	BERKS		NORTH LONDONDERRY	LEBANON
KUTZTOWN	BERKS	SOUTH LONDONDERRY		LEBANON	
LANCASTER AIRPORT	LYONS	BERKS		PALMYRA	LEBANON
	RICHMOND	BERKS		NORTH ANNVILLE	LEBANON
	PINE	ALLEGHENY	MILLER AIRPORT	CLEONA	LEBANON
	RICHLAND	ALLEGHENY		ANNVILLE	LEBANON
ADAMS	BUTLER	SOUTH ANNVILLE		LEBANON	
MARS	BUTLER	NORTH CORNWALL		LEBANON	
LANCASTER AIRPORT	CRANBERRY	BUTLER		HANOVER	BEAVER
	SEVEN FIELDS	BUTLER		FRANKFORT SPRINGS	BEAVER
	FORWARD	BUTLER	MOORHEAD AIRPARK AIRPORT	HANOVER	WASHINGTON
	CALLERY	BUTLER		SMITH	WASHINGTON
VALENCIA	BUTLER	NORTH EAST		ERIE	
EAST PETERSBURG	LANCASTER	HARBORCREEK		ERIE	
LANCASTER AIRPORT	PENN	LANCASTER		NORTH EAST	ERIE
	EAST HEMPFIELD	LANCASTER	MORGANTOWN AIRPORT	GREENFIELD	ERIE
	MANHEIM	LANCASTER		ROBESON	BERKS
	UPPER LEACOCK	LANCASTER		CAERNARVON	BERKS
LITITZ	LANCASTER	NEW MORGAN		BERKS	
LEHIGH VALLEY INT'L AIRPORT	WARWICK	LANCASTER		ELVERSON	CHESTER
	WHITEHALL	LEHIGH		WARWICK	CHESTER
	SALISBURY	LEHIGH		HONEY BROOK	CHESTER
	HANOVER	LEHIGH	MT. PLEASANT-SCOTTDAL AIRPORT	WEST NANTMEAL	CHESTER
BETHLEHEM	LEHIGH	CAERNARVON		LANCASTER	
CATASAUQUA	LEHIGH	UPPER TYRONE		FAYETTE	
COPLAY	LEHIGH	EVERSON		FAYETTE	
MCGINNESS FIELD AIRPORT	ALLENTOWN	LEHIGH		BULLSKIN	FAYETTE
	ALLEN	NORTHAMPTON		MOUNT PLEASANT	WESTMORELAND
	NORTHAMPTON	NORTHAMPTON		EAST HUNTINGDON	WESTMORELAND
	NORTH CATASAUQUA	NORTHAMPTON		MOUNT PLEASANT	WESTMORELAND
MCGINNESS FIELD AIRPORT	EAST ALLEN	NORTHAMPTON	NEW CASTLE MUNICIPAL AIRPORT	SCOTTDAL	WESTMORELAND
	BETHLEHEM	NORTHAMPTON		NEW CASTLE	LAWRENCE
	HANOVER	NORTHAMPTON		NORTH BEAVER	LAWRENCE
	COLUMBIA	LANCASTER		MAHONING	LAWRENCE
MCGINNESS FIELD AIRPORT	MARIETTA	LANCASTER		PULASKI	LAWRENCE
	MOUNTVILLE	LANCASTER		NESHANNOCK	LAWRENCE
	MANOR	LANCASTER	NEW GARDEN FLYING FIELD	UNION	LAWRENCE
	WEST HEMPFIELD	LANCASTER		KENNETT SQUARE	CHESTER
RAPHO	LANCASTER	NEW GARDEN		CHESTER	
EAST DONEGAL	LANCASTER	WEST MARLBOROUGH		CHESTER	
MCVILLE AIRPORT	LOWER WINDSOR	YORK		AVONDALE	CHESTER
	HELLAM	YORK		WEST GROVE	CHESTER
	WRIGHTSVILLE	YORK		EAST MARLBOROUGH	CHESTER
	SOUTH BUFFALO	ARMSTRONG	NEW HANOVER AIRPORT	KENNETT	CHESTER
CADOGAN	ARMSTRONG	LONDON GROVE		CHESTER	
GILPIN	ARMSTRONG	FRANKLIN		CHESTER	
BETHEL	ARMSTRONG	COLEBROOKDALE		BERKS	
MID ATLANTIC SOARING CTR AIRPORT	NORTH BUFFALO	ARMSTRONG		DOUGLASS	BERKS
	MANOR	ARMSTRONG		BOYERTOWN	BERKS
	HAMILTONBAN	ADAMS		DOUGLASS	MONTGOMERY
	FREEDOM	ADAMS	NEW LONDON AIRPORT	NEW HANOVER	MONTGOMERY
HIGHLAND	ADAMS	LOWER POTTS GROVE		MONTGOMERY	
LIBERTY	ADAMS	UPPER FREDERICK		MONTGOMERY	
FAIRFIELD	ADAMS	UPPER POTTS GROVE		MONTGOMERY	
	CARROLL VALLEY	ADAMS		LOWER OXFORD	CHESTER
				UPPER OXFORD	CHESTER

NORTHEAST PHILADELPHIA AIRPORT	BENSALEM	BUCKS	NEW LONDON	CHESTER	
	LOWER MORELAND	MONTGOMERY	ELK	CHESTER	
	PHILADELPHIA	PHILADELPHIA	EAST NOTTINGHAM	CHESTER	
NORTHUMBERLAND COUNTY AIRPORT	CLEVELAND	COLUMBIA	PENN	CHESTER	
	SHAMOKIN	NORTHUMBERLAND	LONDON GROVE	CHESTER	
	RALPHO	NORTHUMBERLAND	FRANKLIN	CHESTER	
	SHAMOKIN	NORTHUMBERLAND	PORT MEADVILLE AIRPORT	UNION	
	COAL	NORTHUMBERLAND	UNION	CRAWFORD	
PENN VALLEY AIRPORT	LOWER AUGUSTA	NORTHUMBERLAND	SUMMIT	CRAWFORD	
	UPPER AUGUSTA	NORTHUMBERLAND	HAYFIELD	CRAWFORD	
	SHAMOKIN DAM	SNYDER	SADSBURY	CRAWFORD	
	MONROE	SNYDER	MEADVILLE	CRAWFORD	
	PENN	SNYDER	VERNON	CRAWFORD	
	SELINGSGROVE	SNYDER	WEST MEAD	CRAWFORD	
	JACKSON	SNYDER	EAST VINCENT	CHESTER	
PENNRIDGE AIRPORT	SELLERSVILLE	BUCKS	EAST COVENTRY	CHESTER	
	SILVERDALE	BUCKS	LIMERICK	MONTGOMERY	
	BEDMINSTER	BUCKS	LOWER FREDERICK	MONTGOMERY	
	EAST ROCKHILL	BUCKS	NEW HANOVER	MONTGOMERY	
	HILLTOWN	BUCKS	LOWER POTTS GROVE	MONTGOMERY	
	PERKASIE	BUCKS	UPPER FREDERICK	MONTGOMERY	
	WEST ROCKHILL	BUCKS	POTTSTOWN	MONTGOMERY	
	RICHLAND	BUCKS	POTTSTOWN MUNICIPAL AIRPORT	AMITY	
PENN'S CAVE AIRPORT	WALKER	CENTRE	DOUGLASS	BERKS	
	GREGG	CENTRE	UNION	BERKS	
	POTTER	CENTRE	NORTH COVENTRY	CHESTER	
	PHILADELPHIA	PHILADELPHIA	LOWER POTTS GROVE	MONTGOMERY	
PENN'S LANDING-PIER 36 HELIPORT	WORCESTER	MONTGOMERY	WEST POTTS GROVE	MONTGOMERY	
	COLLEGEVILLE	MONTGOMERY	POTTSTOWN	MONTGOMERY	
PERKIOMEN VALLEY AIRPORT	SKIPPACK	MONTGOMERY	UPPER POTTS GROVE	MONTGOMERY	
	LOWER SALFORD	MONTGOMERY	MCCALMONT	JEFFERSON	
	TRAPPE	MONTGOMERY	HENDERSON	JEFFERSON	
	LOWER PROVIDENCE	MONTGOMERY	YOUNG	JEFFERSON	
	PERKIOMEN	MONTGOMERY	GASKILL	JEFFERSON	
	UPPER PROVIDENCE	MONTGOMERY	PUNXSUTAWNEY	JEFFERSON	
	TOWAMENCIN	MONTGOMERY	BELL	JEFFERSON	
	PHILADELPHIA INT'L AIRPORT	GLENOLDEN	DELAWARE	BIG RUN	JEFFERSON
	NORWOOD	DELAWARE	MILFORD	BUCKS	
	DARBY	DELAWARE	QUAKERTOWN	BUCKS	
PROSPECT PARK	DELAWARE	WEST ROCKHILL	BUCKS		
PHILADELPHIA SEAPLANE BASE	SHARON HILL	DELAWARE	RICHLAND	BUCKS	
	TINICUM	DELAWARE	TRUMBAUERSVILLE	BUCKS	
	DARBY	DELAWARE	WHITEHALL	LEHIGH	
	COLWYN	DELAWARE	LOWER MACUNGIE	LEHIGH	
	FOLCROFT	DELAWARE	SALISBURY	LEHIGH	
	PHILADELPHIA	PHILADELPHIA	SOUTH WHITEHALL	LEHIGH	
	CHESTER	DELAWARE	EMMAUS	LEHIGH	
	GLENOLDEN	DELAWARE	UPPER MILFORD	LEHIGH	
	NORWOOD	DELAWARE	ALLEN TOWN	LEHIGH	
	EDDYSTONE	DELAWARE	UPPER SAUCON	LEHIGH	
PITTSBURGH INTERNATIONAL AIRPORT	DARBY	DELAWARE	READING REGIONAL AIRPORT	SPRING	
	PROSPECT PARK	DELAWARE	MUHLNBERG	BERKS	
	RIDLEY PARK	DELAWARE	BERN	BERKS	
	RUTLEDGE	DELAWARE	WEST READING	BERKS	
	TINICUM	DELAWARE	READING	BERKS	
	RIDLEY	DELAWARE	ONTOLAUNEE	BERKS	
	FOLCROFT	DELAWARE	LAURELDALE	BERKS	
	PHILADELPHIA	PHILADELPHIA	LOWER HEIDELBERG	BERKS	
	MOON	ALLEGHENY	WYOMISSING	BERKS	
	NORTH FAYETTE	ALLEGHENY	CONEWAGO	DAUPHIN	
PITTSBURGH-MONROEVILLE AIRPORT	FINDLAY	ALLEGHENY	DERRY	DAUPHIN	
	PITCAIRN	ALLEGHENY	NORTH LONDONDERRY	LEBANON	
	PLUM	ALLEGHENY	SOUTH LONDONDERRY	LEBANON	
	CHURCHILL	ALLEGHENY	PALMYRA	LEBANON	
	PENN HILLS	ALLEGHENY	NORTH ANNVILLE	LEBANON	
POCONO MTS. MUNICIPAL AIRPORT	MONROEVILLE	ALLEGHENY	SOUTH ANNVILLE	LEBANON	
	WILKINS	ALLEGHENY	ROSTRAVER AIRPORT	FORWARD	
	POCONO	MONROE	ELIZABETH	ALLEGHENY	
	BARRETT	MONROE	CARROLL	WASHINGTON	
	MT POCONO	MONROE	DONORA	WASHINGTON	
ROYALE HELIPORT	COOLBAUGH	MONROE	ROSTRAVER	WESTMORELAND	
	TOBYHANNA	MONROE	WEST NEWTON	WESTMORELAND	
	PARADISE	MONROE	SEWICKLEY	WESTMORELAND	
			SUTERSVILLE	WESTMORELAND	
			HANOVER	WASHINGTON	
			JEFFERSON	WASHINGTON	
			SMITH	WASHINGTON	

SCHNEIDERS FIELD AIRPORT	BRIDGETON	BUCKS		BURGETTSTOWN	WASHINGTON	
	DURHAM	BUCKS	SCANDIA AIRPARK	ELK	WARREN	
	HAYCOCK	BUCKS		PINE GROVE	WARREN	
	TINICUM	BUCKS		GLADE	WARREN	
	NOCKAMIXON	BUCKS				
SPRINGFIELD	BUCKS					
SCHUYLKILL CO/JOE ZERBEY AIRPORT	BUTLER	SCHUYLKILL	ST. MARYS MUNICIPAL AIRPORT	ST MARYS	ELK	
	GORDON	SCHUYLKILL		JAY	ELK	
	CASS	SCHUYLKILL		FOX	ELK	
	HEGINS	SCHUYLKILL	STROUDSBURG-POCONO AIRPORT	MIDDLE SMITHFIELD	MONROE	
	FOSTER	SCHUYLKILL		EAST STROUDSBURG	MONROE	
	FRAILEY	SCHUYLKILL		PRICE	MONROE	
	BARRY	SCHUYLKILL		SMITHFIELD	MONROE	
	REILLY	SCHUYLKILL		STROUD	MONROE	
ELDRED	SCHUYLKILL	SUNBURY AIRPORT	ROCKEFELLER	NORTHUMBERLAND		
WEST ABINGTON	LACKAWANNA		NORTHUMBERLAND	NORTHUMBERLAND		
DALTON	LACKAWANNA		SUNBURY	NORTHUMBERLAND		
SEAMANS FIELD	BENTON	LACKAWANNA		POINT	NORTHUMBERLAND	
	NORTH ABINGTON	LACKAWANNA		UPPER AUGUSTA	NORTHUMBERLAND	
	LAPLUME	LACKAWANNA		SHAMOKIN DAM	SNYDER	
	NICHOLSON	WYOMING		MONROE	SNYDER	
	CLINTON	WYOMING	SUNBURY SEAPLANE BASE	UNION	UNION	
	NICHOLSON	WYOMING		LIBERTY	MONTOUR	
	FACTORYVILLE	WYOMING		RUSH	NORTHUMBERLAND	
	SEVEN SPRINGS AIRPORT	SPRINGFIELD	FAYETTE		SNYDERTOWN	NORTHUMBERLAND
		SALTICK	FAYETTE		NORTHUMBERLAND	NORTHUMBERLAND
		SEVEN SPRINGS	FAYETTE		POINT	NORTHUMBERLAND
		MIDDLECREEK	SOMERSET		UPPER AUGUSTA	NORTHUMBERLAND
		SEVEN SPRINGS	SOMERSET	TITUSVILLE AIRPORT	TROY	CRAWFORD
UPPER TURKEYFOOT		SOMERSET	HYDETOWN		CRAWFORD	
JEFFERSON		SOMERSET	TITUSVILLE		CRAWFORD	
DONEGAL		WESTMORELAND	OIL CREEK		CRAWFORD	
SHIPPENSBURG AIRPORT	SHIPPENSBURG	CUMBERLAND		CHERRYTREE	VENANGO	
	SOUTH NEWTON	CUMBERLAND		PLUM	VENANGO	
	NORTH NEWTON	CUMBERLAND	UNIVERSITY PARK AIRPORT	STATE COLLEGE	CENTRE	
	SOUTHAMPTON	CUMBERLAND		FERGUSON	CENTRE	
	SHIPPENSBURG	CUMBERLAND		PATTON	CENTRE	
SHOESTRING AVIATION AIRPORT	SPRINGFIELD	YORK		BENNER	CENTRE	
	EAST HOPEWELL	YORK		COLLEGE	CENTRE	
	SHREWSBURY	YORK	VALLEY FORGE BICENTENNIAL HELIPIORT	TREDYFFRIN	CHESTER	
	SHREWSBURY	YORK		SCHUYLKILL	CHESTER	
	HOPEWELL	YORK		BRIDGEPORT	MONTGOMERY	
	NORTH HOPEWELL	YORK		WORCESTER	MONTGOMERY	
	WINTERSTOWN	YORK		UPPER MERION	MONTGOMERY	
	RAILROAD	YORK		WEST NORRITON	MONTGOMERY	
SKY HAVEN AIRPORT	EATON	WYOMING		NORRISTOWN	MONTGOMERY	
	WASHINGTON	WYOMING		LOWER PROVIDENCE	MONTGOMERY	
	TUNKHANNOCK	WYOMING		EAST NORRITON	MONTGOMERY	
	TUNKHANNOCK	WYOMING		UPPER PROVIDENCE	MONTGOMERY	
SLATINGTON AIRPORT	LOWER TOWAMENSING	CARBON	VAN SANT AIRPORT	TINICUM	BUCKS	
	BOWMANSTOWN	CARBON		NOCKAMIXON	BUCKS	
	EAST PENN	CARBON	VENANGO REGIONAL AIRPORT	SANDY CREEK	VENANGO	
	PALMERTON	CARBON		FRENCH CREEK	VENANGO	
	SLATINGTON	LEHIGH		CRANBERRY	VENANGO	
	WASHINGTON	LEHIGH		VICTORY	VENANGO	
	WALNUTPORT	NORTHAMPTON		SUGARCREEK	VENANGO	
	LEHIGH	NORTHAMPTON		POLK	VENANGO	
SMOKETOWN AIRPORT	PARADISE	LANCASTER		FRANKLIN	VENANGO	
	LANCASTER	LANCASTER	WASHINGTON COUNTY AIRPORT	CANTON	WASHINGTON	
	LEACOCK	LANCASTER		NORTH FRANKLIN	WASHINGTON	
	UPPER LEACOCK	LANCASTER		AMWELL	WASHINGTON	
	EAST LAMPETER	LANCASTER		BUFFALO	WASHINGTON	
	STRASBURG	LANCASTER		WASHINGTON	WASHINGTON	
	WEST LAMPETER	LANCASTER		SOUTH FRANKLIN	WASHINGTON	
	STONYCREEK	SOMERSET		GREENHILLS	WASHINGTON	
SOMERSET	SOMERSET	WEST PENN AIRPORT		TARENTUM	ALLEGHENY	
QUEMAHONING	SOMERSET		EAST DEER	ALLEGHENY		
LINCOLN	SOMERSET		WEST DEER	ALLEGHENY		
SOUTHERN ADAMS COUNTY HELIPIORT	FREEDOM		ADAMS	SPRINGDALE	ALLEGHENY	
	LIBERTY		ADAMS	FAWN	ALLEGHENY	
	MOUNT JOY		ADAMS	HARMAR	ALLEGHENY	
	CUMBERLAND	ADAMS	FRAZER	ALLEGHENY		
SPRING HILL AIRPARK	MADISON	LACKAWANNA		INDIANA	ALLEGHENY	
	SALEM	WAYNE		ARNOLD	WESTMORELAND	
	STERLING	WAYNE		NEW KENSINGTON	WESTMORELAND	
				LOWER BURRELL	WESTMORELAND	

Airport Land Use Compatibility Guidelines

March 1996

WESTMORELAND COUNTY AIRPORT	UNITY	WESTMORELAND	ZELIENOPE MUNICIPAL AIRPORT	FRANKLIN	BEAVER
	DERRY	WESTMORELAND		MARION	BEAVER
	LATROBE	WESTMORELAND		NEW SEWICKLEY	BEAVER
	YOUNGSTOWN	WESTMORELAND		HARMONY	BUTLER
WILKES-BARRE/SCRANTON INT'L APT.	SCRANTON	LACKAWANNA		JACKSON	BUTLER
	SPRINGBROOK	LACKAWANNA		ZELIENOPE	BUTLER
	MOOSIC	LACKAWANNA		LANCASTER	BUTLER
	TAYLOR	LACKAWANNA			
	RANSOM	LACKAWANNA			
	OLD FORGE	LACKAWANNA			
	HUGHESTOWN	LUZERNE			
	DURYEA	LUZERNE			
	DUPONT	LUZERNE			
	PITTSTON	LUZERNE			
	AVOCA	LUZERNE			
	PITTSTON	LUZERNE			
WILKES-BARRE/WYOMING VALLEY APT.	LAFLIN	LUZERNE			
	YATESVILLE	LUZERNE			
	COURTDALE	LUZERNE			
	WYOMING	LUZERNE			
	JENKINS	LUZERNE			
	EXETER	LUZERNE			
	EXETER	LUZERNE			
	FORTY FORT	LUZERNE			
	WEST WYOMING	LUZERNE			
	WEST PITTSTON	LUZERNE			
	SWOYERSVILLE	LUZERNE			
	KINGSTON	LUZERNE			
	LUZERNE	LUZERNE			
	PRINGLE	LUZERNE			
	PITTSTON	LUZERNE			
	PLAINS	LUZERNE			
	WILKES BARRE	LUZERNE			
	KINGSTON	LUZERNE			
WILLIAM T. PIPER MEMORIAL AIRPORT	ALLISON	CLINTON			
	LAMAR	CLINTON			
	WAYNE	CLINTON			
	BALD EAGLE	CLINTON			
	CASTANEA	CLINTON			
	DUNNSTABLE	CLINTON			
	FLEMINGTON	CLINTON			
	LOCK HAVEN	CLINTON			
	WOODWARD	CLINTON			
WILLIAMSPORT/LYCOMING COUNTY APT.	ARMSTRONG	LYCOMING			
	LOYALSOCK	LYCOMING			
	UPPER FAIRFIELD	LYCOMING			
	MONTOURSVILLE	LYCOMING			
	CLINTON	LYCOMING			
	FAIRFIELD	LYCOMING			
WINGS FIELD	AMBLER	MONTGOMERY			
	LOWER GWYNEDD	MONTGOMERY			
	PLYMOUTH	MONTGOMERY			
	UPPER DUBLIN	MONTGOMERY			
	WHITEMARSH	MONTGOMERY			
	NORRISTOWN	MONTGOMERY			
	WHITPAIN	MONTGOMERY			
	EAST NORRITON	MONTGOMERY			
WPHS HELIPORT	UPPER TYRONE	FAYETTE			
	EVERSON	FAYETTE			
	BULLSKIN	FAYETTE			
	MOUNT PLEASANT	WESTMORELAND			
	EAST HUNTINGDON	WESTMORELAND			
	MOUNT PLEASANT	WESTMORELAND			
	SCOTTDALE	WESTMORELAND			
YORK AIRPORT	WEST MANCHESTER	YORK			
	JACKSON	YORK			
	DOVER	YORK			
	NORTH CODORUS	YORK			
	SPRING GROVE	YORK			
	PARADISE	YORK			

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