



Iowa Airport Land Use Guidebook



CHAPTER 5

PREVENTION AND MITIGATION STRATEGIES





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5.0 Prevention and Mitigation Strategies

The prevention and mitigation of incompatible land use is a challenging task that often requires the use of a multitude of techniques. With airports facing encroachment from various types of land uses, as well as political, environmental, and public pressures, it is necessary to evaluate each individual airport and its environs to assess their needs. Land use decisions are often influenced by an array of criteria; therefore, it is imperative to understand the complicated relationship between land uses, airports, and host communities. This chapter summarizes a collection of generally accepted methods for the prevention, mitigation, and limitation of incompatible land uses, which can be adapted to address the specific needs of individual airports.

Planning techniques and zoning ordinances are used at the local level to prevent incompatible land uses.

Preventative and mitigation strategies are tools that federal, state, and local governments can utilize to address incompatible land uses. While federal and state agencies develop guidelines and recommendations for compatible land use, the majority of the responsibility for implementation and enforcement of programs and decisions lie with local government officials, city and county planners, airports sponsors, and citizens.

An airport's area of influence and related airspace can often span across multiple jurisdictions, further complicating the implementation of land use controls. Communities that lie within the airport's jurisdictional boundary must coordinate efforts to preserve and protect the airport's environs. Iowa Code, Chapter 28E *Joint Exercise of Governmental Powers*, Section 23E.1 enables multiple jurisdictions to enter into partnerships to provide a means for continued growth and development of the surrounding communities including airport facilities, as well as Chapter 329 *Airport Zoning* that allows for extraterritorial airport zoning. Effective communication between all entities involved is essential to the development, implementation, and maintenance of compatible land uses. **Appendix M** of the Guidebook provides a brief summary of these Code sections, which can also be accessed at web site:

www.legis.state.ia.us/IowaLaw.html



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Local governments are responsible for developing comprehensive plans and local zoning ordinances, as well as reviewing site plans, plat maps (maps that define lot boundaries), and subdivision plans to maintain compatible land use within the airport's environs. Various local units of government involved in the planning process can include but are not limited to:

- City councils
- City planning and zoning departments
- City building departments
- County boards and commissions
- County planning departments
- Regional planning agencies
- Airport authorities and commissions

Coordination and communication between local units of government and airports is vital to the effective implementation and enforcement of land use compatibility plans, which include compatible land use within the airport's environs.

In an effort to build cooperation, the aforementioned entities need to be involved in the planning process, as well as those who:

- Are directly involved in transportation
- Depend on the airport for product transport
- Have influence on overall community plans
- Are transportation professionals
- Use the airport for daily activities
- Are community decision makers
- Are impacted by airport projects

Involving public agencies, as well as business interests and aviation users, creates a more comprehensive forum from which to develop land use compatibility plans. Local understanding and support is essential to preserve the community's aviation needs and result in the successful implementation of a land use compatibility plan, which should protect the airport from the encroachment of incompatible land uses.



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Communities and airports are unique in their physical requirements, goals, users, service markets, environs, and local economies. Each factor shapes the overall development of a land use compatibility plans for individual airports. **Table 5-1** illustrates the relationships between stakeholders within the community and their role as it relates to land use compatibility issues. Criteria such as the type of ownership, local size, political structure, community interest in the airport, and the type of airport are all involved in the implementation of compatible land use decisions. Consequently, the strategies outlined in this Chapter should be evaluated on a case-by-case basis to develop an appropriate plan for land use compatibility for individual airports.

Table 5-1 Matrix of Authority for Compatible Land Use Plans

Area of Interest	Primary Responsibility	Supporting Responsibility
Preservation of the state system of airports	Airport sponsors	FAA
		Iowa DOT Office of Aviation
		Local governments (zoning and comprehensive planning)
Safe air travel	FAA	Iowa DOT Office of Aviation
	Airport sponsor	
	Airlines	
Adequate airport capacity	Airport sponsors	FAA
		Iowa DOT Office of Aviation
Minimizing the negative impacts of airport operations	Airport sponsors	State agencies
		Federal agencies
		Local governments (zoning and comprehensive planning)
Planning for airport-compatible land uses	Local government	Airport sponsors
	County government	Iowa DOT Office of Aviation
	Regional government	FAA
Approval of land uses	Local government	Zoning and comprehensive planning

Source: Adapted from Airports and Compatibility Land Use, Washington State, 1999



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As illustrated in **Table 5-1**, the responsibility for prevention, mitigation, and restriction of land use incompatibility lies with a number of agencies. The primary responsibility is vested within local governmental entities such as elected officials, local planning commissions, and planning departments.

While some of the prevention and mitigation techniques are authorized by state level agencies, local agencies are typically responsible for the day-to-day management and implementation of prevention and mitigation strategies. Various strategies available for use can be grouped into four primary categories:

- Planning related strategies
 - Comprehensive plans
 - Airport layout plan/master plan
 - Airport land use zoning ordinance
 - Height zoning ordinances
 - Disclosure requirements
 - Site plan reviews
 - Plat reviews
 - Deed restrictions
- Natural features
 - Wildlife hazards
 - Vegetation
- Acquisition and notification strategies
 - Fee simple acquisitions
 - Avigation and noise easements
 - Non-suit covenants
 - Disclosure to real estate buyers
 - Hold harmless agreements
- Noise mitigation strategies
 - Sound barriers
 - Sound proofing



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The strategies can be used separately on a case-by-case basis or in conjunction with multiple strategies to mitigate land uses to best suit the community and airport needs. Each of these categories and their associated strategies are described in the following pages to provide additional details when addressing land use issues. This is not an all inclusive list, but rather a sample of the most widely used strategies. If other opportunities present themselves, it is recommended that local agencies consult the Office of Aviation and the FAA for potential use.

Table 5-2 illustrates a summary of the various prevention and mitigation strategies related to the specific Airport Overlay Zones. Many of the strategies and tools can be applied across numerous zones; however, some are more appropriate in a specific zone than others, which are illustrated in the following table. For example, land acquisition is most appropriate in Zone A, however, instances can arise where land acquisition is an option in Zones B and C, while Zones D and E are not likely to experience a need to utilize land acquisition.



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Table 5-2 Prevention and Mitigation Strategies Overview

	Zone A	Zone B	Zone C	Zone D	Zone E
<i>A = Appropriate O = Optional L = Limited Use</i>					
Planning Related Strategies					
<i>Comprehensive Plans</i>	A	A	A	A	A
<i>Airport Layout Plans and Master Plans</i>	A	A	O	O	O
<i>Airport Land Use Zoning Ordinance</i>	A	A	A	A	A
<i>Height Zoning Ordinance</i>	A	A	A	A	A
<i>Disclosure Requirements</i>	A	A	A	A	O
<i>Site Plan Reviews</i>	A	A	A	O	O
<i>Plat Reviews</i>	O	O	O	O	L
<i>Deed Restrictions</i>	O	O	O	O	L
Natural Features					
<i>Wildlife Hazards</i>	A	A	A	O	O
<i>Vegetation</i>	A	A	A	O	O
Acquisition and Notification Strategies					
<i>Fee Simple Acquisition</i>	A	O	O	L	L
<i>Avigation and Noise Easements</i>	A	A	O	O	L
<i>Non-Suit Covenants</i>	A	A	O	O	L
<i>Disclosure to Real Estate Buyers</i>	A	A	O	O	O
<i>Hold Harmless Agreements</i>	O	A	O	O	L
Noise Mitigation Strategies					
<i>Sound Barriers</i>	A	A	O	O	O
<i>Sound Proofing</i>	A	A	O	O	O

Source: Mead & Hunt



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5.1 *Planning Related Strategies*

Planning provides a framework to establish a baseline of existing land uses and forecast future growth. Compatible land use planning techniques focus on site-specific issues within local communities. There are a number of preventative tools and techniques local governments can implement to discourage incompatible land uses including:

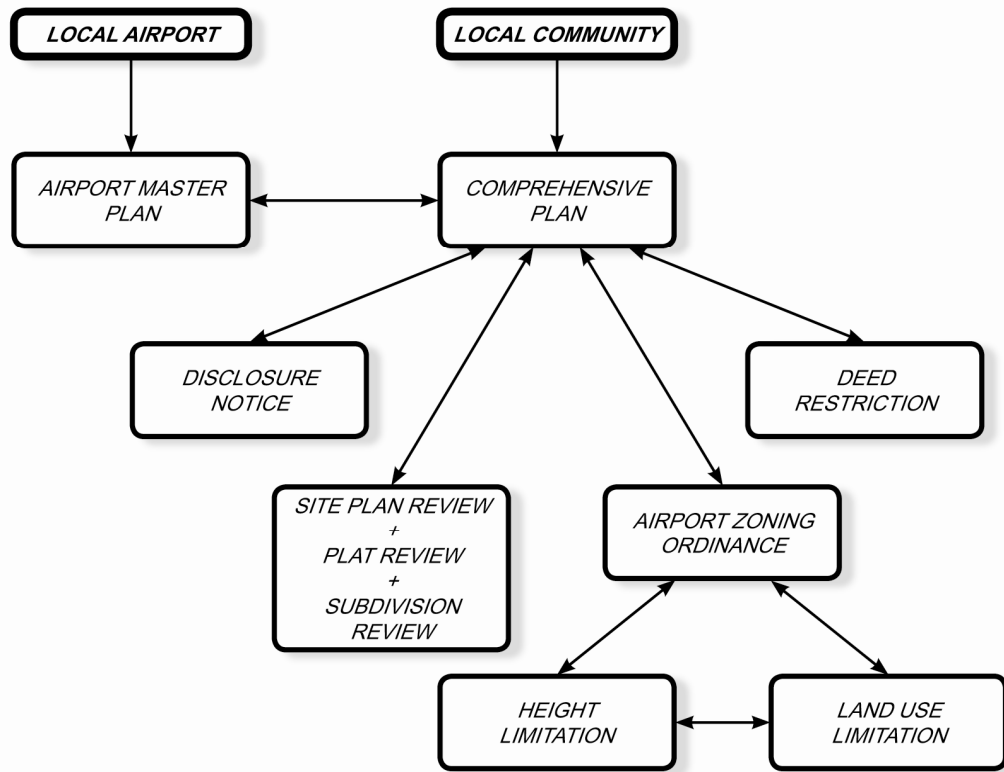
- Comprehensive plans
- Airport layout plans/airport master plans
- Airport overlay zoning ordinances
 - Land uses
 - Height
- Disclosure requirements
- Site plan review and plat review
- Deed restrictions

The planning techniques noted in this chapter will address the issue of incompatible land uses and how they relate to airports in a way that will help airport sponsors, planners, elected officials, and residents understand the need for compatible land use near airports.

Strong local leadership and support from elected officials is important to successful planning efforts at the airport and community level. Engaging and educating local citizens within the vicinity of an airport is essential to create an effective working relationship between elected officials, local airports, and residents. This greater understanding by all participants can enhance the implementation process of planning related strategies.

Figure 5-1 illustrates the relationship between the various planning techniques. The following pages discuss the preventative tools that are available to local governments for regulation around airport property.

Figure 5-1 Relationship of Planning Strategies



Source: Mead & Hunt, Inc.

Planning techniques serve as the foundation from which preventive and corrective mitigation measures can be implemented for compatible land use issues that involve existing developments, future growth of the airport, and surrounding communities. These planning techniques are typically utilized in three forms: plans, ordinances, and regulations. Planning documents (plans) provide the basis for the development of ordinances and regulations, which provide structure for the implementation of land use controls. Ordinances are legal documents that are developed by municipalities to regulate land uses and associated activities with designated locations to protect, preserve, and enhance the quality of life for residents. Regulations are the tools that provide authority for the day-to-day implementation of an ordinance. The combination of all three of these techniques is necessary for effective land use planning.



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Ordinances reflect what is written in a community's comprehensive plan and are effective tools to reduce incompatible land uses surrounding airports. When a local municipality undertakes the development of a zoning ordinance for land use compatibility, consideration should be given to current zoning and approval actions required by state agencies. A legal review of the proposed airport land use and height overlay zoning ordinance is suggested to determine if the ordinance is consistent with local and state regulations.

Zoning ordinances are used to specify permitted, regulated, and/or restricted land uses that may endanger the health, safety, and welfare of citizens. Ordinances that regulate airport land use and height should be incorporated into a city and/or county's comprehensive zoning ordinance to protect the safe operation of airports and movement of aircraft, as well as the safety of people on the ground in proximity to airports.

Purpose of Zoning

Protect property values

Protect natural resources

Prevent nuisances

Ensure land use compatibility

Prevent overcrowding

Prevent overuse

5.1.a. Comprehensive Plan

A local comprehensive plan should address land use as it relates to growth and development of the surrounding community, on a county, township, and city basis. A comprehensive plan is a strategic, long-range document and generally includes: maps, charts, and text that explain the goals and objectives established within the plan. Ideally, local governments use comprehensive plans to guide the development of zoning ordinances, master plans, and airport land use compatibility plans in order to make coordinated decisions regarding compatible land use within the airports jurisdictional boundary established by the planning process. The development of a comprehensive plan consists of several phases including initial planning and preparation, followed by public participation, review and evaluation, and final adoption and implementation. The Iowa Code authorizes cities and counties to adopt comprehensive plans. While comprehensive planning is technically not required in Iowa, a city or county may find it difficult to defend zoning and land use decisions without a comprehensive plan.



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Questions often asked during the comprehensive planning process:

Why do we need a Comprehensive Plan?

What do we value in our community?

Where should different land uses be located?

How will development affect our environment?

How will development affect our infrastructure?

How does our land use fit within our surrounding community?

It is essential that the comprehensive planning process of a local community consider its local or neighboring airport(s). If a local planning document does not provide a foundation to support decision making regarding the development of compatible land use in the vicinity of a local airport, it is unlikely that an effective planning process can be accomplished. Airport sponsors should become involved early in the planning process to share the airport needs and future development plans with the local municipality. This involvement should focus on educating the local municipality regarding the value the airport brings to the community, as well as the need to preserve its operational areas. Airports sponsors can become involved in the planning process in several ways:

- Have representation on the planning advisory/steering committee.
- Provide comments during the public comment portion of the process.
- Provide comments to other representatives of the advisory/steering committee to present airport related concerns and issues.
- Share airport master plans/airport layout plans with the local municipality to inform them of airport development.
- Become engaged in the general planning process to be involved on a regular basis, not just during comprehensive planning exercises.

5.1.b. Airport Layout Plan/Airport Master Plan

An airport layout plan/airport master plan is a long-range plan that details the growth and development of the airport. These plans are typically based on a 20-year planning time frame and should be reviewed and updated every five to 10 years. The contents of an airport master plan are governed by the FAA AC 150/5070-6B, *Airport Master Plans* and can be found on the FAA web site at web address:

www.faa.gov/airports_airtraffic/airports/resources/advisory_circulars/media/150-5070-6B/150_5070_6b_chg1.pdf



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The airport layout plan/master plan provides local decision-makers with information to guide growth and development of the airport and should be used as a resource for the development of other community planning documents, such as a local comprehensive plan. These plans should be provided to the local land use decision-makers when they are evaluating projects in proximity to an airport in order to maintain compatible land uses for ultimate airport development. These plans are a guide in the continued development of the airport. AC 150/5070-6B, *Airport Master Plans*

5.1.c. Airport Overlay Zoning Ordinance

An Airport Overlay Zoning Ordinance (AOZO) is an extraterritorial tool that promotes compatible land use and height limitations within the vicinity of an airport. The sponsoring jurisdiction determines the specific distance governed by the AOZO. **Appendix Q** provides an outline to assist the sponsoring party with the development of an Airport Land Use and Height Overlay Zoning Ordinance Outline. The AOZO can include:

- Land use related restrictions
- Height related restrictions
- Combination of height and land use related restrictions

However, it is recommended that the combination of height and land use restrictions be utilized when developing the AOZO in order to adequately protect the airport, safe movement of aircraft, as well as the persons on the ground within the vicinity of airports. Overlay zoning applies additional conditions or restrictions to a specified area while retaining the existing base zoning classification underneath the overlay zoning districts. Airport sponsors that currently have a height related ordinance may want to consider adding land use restrictions. The AOZO outline provided in **Appendix Q** can also be useful in updating an existing ordinance.

It is highly recommended to implement a combination of height and land use restrictions to protect the airport from incompatible land uses.



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The AOZO can be highly effective in addressing a number of potential incompatibilities related to airport operational areas. An AOZO may limit the height of objects surrounding an airport, as well as restricting specific land uses that create conditions potentially hazardous to air navigation which are essential in order to protect the health, safety, and welfare of residents, as well as maintain safe aircraft movement and airport operational areas.

- **Land Use Related Restrictions**

An AOZO that addresses land use issues supersedes the existing underlying zoning within specified zoning districts and are adopted by city and/or county governments in order to prevent or mitigate potentially incompatible land uses such as:

- Noise sensitivity related issues
- Safety related issues
 - High concentrations of people
 - Tall structures
 - Visual obstructions
 - Wildlife and bird attractants

Details regarding airport overlay zoning districts are discussed in greater detail within Chapter 4 of the Guidebook. In addition, detailed explanations regarding the aforementioned incompatible land uses can be found within Chapter 3 of the Guidebook.

Iowa Code Chapter 329 *Airport Zoning*, provides cities and counties with the ability to enforce zoning regulations or land use regulation to protect and preserve airport facilities. Section 329.2 *Airport Hazards* addresses the issues related to safe aircraft navigation during various phases of flight (departure, approach, and maneuvering). Iowa Code Chapter 335 *County Planning and Zoning*, specifically provides counties with the ability to plan and zone districts that pertain to the local airport. Chapter 414 *Municipal Planning and Zoning*, provides cities with the ability to plan and zone districts that pertain to the local airport. **Appendix M** contains a summary of Iowa's Code, which can be supplemented by utilizing Iowa's legislative web address can be found on the following web site:

www.legis.state.ia.us/IowaLaw.html



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- **Height Related Restrictions**

An AOZO that focuses on the safety of the airport and the public must include height restrictions for developments beyond airport property lines. Multiple jurisdictions can fall within an airport's jurisdictional boundary (i.e. three-mile radius). This concept is known as 'extraterritorial zoning' and it plays an important role in land use development in regions that have an airport or multiple airports. Used as part of an AOZO, height restrictions preserve navigable airspace.

Legally mandated by the FAA in Federal Aviation Regulation (FAR) Part 77, *Objects Affecting Navigable Airspace*, any object or structure that penetrates any of the 'imaginary surfaces' is considered to be an obstruction to air navigation and form the basis for height restriction zoning ordinances. Details regarding specific height restrictions should be included in the AOZO and kept on file with the appropriate governmental agencies (i.e. county, Office of Aviation, FAA, etc.).

FAR Part 77 specifically requires that any person/organization who intends to sponsor any of the following construction or alterations must notify the Administrator of the FAA prior to construction:

- Any construction or alteration exceeding 200 feet above ground level.
- Any construction or alteration:
 - Within 20,000 feet of a public use or military airport which exceeds a 100:1 surface from any point on the runway of each airport with at least one runway more than 3,200 feet.
 - Within 10,000 feet of a public use or military airport which exceeds a 50:1 surface from any point on the runway of each airport with its longest runway no more than 3,200 feet.
 - Within 5,000 feet of a public use heliport which exceeds a 25:1 surface.
- Any highway, railroad, or other traverse way whose prescribed adjusted height would exceed that above noted standards.
- When requested by the FAA.



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- Any construction or alteration located on a public use airport or heliport regardless of height or location.

Notification to FAA for off-airport development is done through web site, *Obstruction Evaluation/Airport Airspace Analysis (OE/AAA)* that allows for electronic filing of the *Notice of Proposed Construction or Alteration* (FAA Form 7460-1). Instructions for filing notification for on-airport development can be found at the following web site:

<https://oeaaa.faa.gov/oeaaa/external/portal.jsp>

In addition to FAR Part 77 requirements, Iowa Code Chapter 414, *Municipal Planning and Zoning* Section 414.1 *Building Restrictions* and 414.3 *Basis of Regulations* allows cities to regulate building heights. Iowa Code Chapter 335 *County Planning and Zoning* also allows counties to regulate the height and location of structures, as well as Chapter 329 *Airport Zoning* which also regulates obstruction that may pose a hazard to aircraft within the vicinity of the airport. **Appendix M** of the Guidebook summarizes this legislation; additionally the web site listed may be referenced for specific details:

www.legis.state.ia.us/IowaLaw.html

5.1.d. Disclosure Requirements

Disclosure requirements can be an effective way to notify future property owners of their proximity to an airport or area impacted by aircraft use. A disclosure notice is a legal document, recorded with the local municipality, which follows the title for a specific parcel of property. Disclosure requirements can be established as part of a site plan review, local zoning ordinance, or can be a stand alone process for properties near airport environs.



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A disclosure requirement can be as easy as putting the property owner on notice that a specific parcel of property lies in proximity to an airport, which may have potential safety hazards and noise issues associated with living near an airport. This notice would allow the property owner to utilize approved construction techniques and materials to soundproof the home to reduce noise impacts from aircraft utilizing the airport. Refer to **Appendix D** for sample language to be used when disclosing airport related noise issues to real estate buyers.

5.1.e. Site Plan Review and Plat Review

Local zoning ordinances often require that individuals requesting developments of any type submit a site plan for review. Local municipal planners review the site plan to verify that the proposed development meets all zoning requirements and is an appropriate land use. During the review process, high concentrations of people, development densities, and potential impacts to local airports should be considered.

Sites that are set for development must first be analyzed by local planning commissions to verify that the proposed development meets all related zoning requirements. Local subdivision ordinances identify requirements for parcel layouts. Both certified survey map (CSM) and subdivision plat review are required prior to the start of construction at a site. As part of the review process, population and development density are studied for airport compatibility and are subject to change on the opinion of the local planning commission. The number of people that will congregate within a particular development can be reviewed during the pre-construction process to be sure that developments of higher density are not allowed near airport approach zones.



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The layout of property boundaries should also be reviewed in order to preserve aircraft safety, as there are additional considerations when adjacent or within one mile of the airport. A review guarantees that land use decisions are discussed between local officials and developers before the development is allowed to begin. Plat and CSM review is also an important tool in preserving airport environs through the legal overview of parcel maps and subdivided parcels before development can begin. Such review is typically called for in the subdivision ordinance. **Appendix E** provides sample language to be used relating to a Non-suit Covenant and **Appendix F** provides sample language for a Noise Easement, while **Appendix G** provides an Avigation Easement sample language.

5.1.f. Deed Restriction

Deed restrictions are an effective way to regulate the development of a specific parcel of property. A deed restriction is a legal document, recorded with the local municipality, which follows the title of that particular parcel of property. The deed restriction defines what the property owner can and can not do with the property as it pertains to the airport. Deed restrictions can be established as part of a site and/or plat plan review process by either the local municipality or the county that has jurisdiction over the airport.

5.2 *Natural Features*

Natural features should be considered in airport overlay zoning and land use planning. Tall trees or the presence of wildlife can threaten navigable airspace. Effective planning is critical for safe aircraft operations. Natural feature planning strategies include addressing wildlife hazards and vegetation concerns. Each of these features are discussed below.



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5.2.a. Wildlife Hazards

A significant amount of research has been completed on issues pertaining to wildlife management and is consolidated in the FAA/Department of Agriculture, *Wildlife Hazard Management at Airports* manual. This manual was developed for airport personnel and provides a considerable amount of information related to wildlife hazards on or near airport environs. The *Wildlife Hazard Management at Airports* manual can be referenced at the following web site:

http://wildlife.pr.erau.edu/EnglishManual/2005_FAA_Manual_complete.pdf

This resource should be consulted to develop site specific wildlife management plans for the reduction or elimination of wildlife attractants on or near airport property. Implementation efforts to monitor wildlife activity are an important step to determine how to protect airports from wildlife hazards such as aircraft strikes with deer and birds.

Each airport has a unique blend of wildlife concerns ranging from waterfowl (i.e. geese) and raptors (i.e. hawks, owls, and falcons) to small and large mammals (i.e. woodchucks and deer). All available resources and management techniques need to be utilized to develop a wildlife management plan that addresses specific airport needs.

Methods to address wildlife mitigation issues typically begin with a wildlife hazard assessment. This process evaluates specific wildlife issues at airports and provides a baseline from which mitigation can be developed through the use of a Wildlife Control Plan. A Wildlife Control Plan is a comprehensive tool that includes specific control techniques and habitat modifications to detach wildlife within airport environs. Control techniques include wildlife removal, fence installation, and airport grounds maintenance in such a way that wildlife is not attracted to the area. Available wildlife habitat management techniques can include but are not limited to:

- Adequately spacing of non-fruit bearing trees.
- Maintaining vegetation such as grass in a manner to be undesirable, unattractive cover and habitat to indigenous and migratory wildlife.
- Reduce and/or eliminate standing water to diminish the attractant.
- Use of audio repellents such as propane cannons to scare and disperse wildlife.

Wildlife Hazard Management at airports is an important reference guide in developing site specific wildlife management plans.



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- Manage consumer waste to reduce accessibility.
- Manage crops in farmed areas to minimize available food sources such as prohibiting cereal grain crops.
- Install wildlife fence to reduce access to airport operational areas.

Additionally, there are techniques available that can be used to mitigate wildlife problems such as:

- Physical relocation of wildlife, such as trapping and removal of deer.
- Depredation of wildlife, which may require permits from local, state, or federal agencies.
- Use of pyrotechnics or noise makers to scare wildlife.

If considering depredation of migratory birds, contact the US Fish and Wildlife Service for permitting information. The Iowa Department of Natural Resources should be contacted for information related to depredation of deer. Contact information can be found in **Appendix L**.

As previously mentioned in Chapter 3 of the Guidebook, Iowa DOT Office of Aviation entered into a cooperative agreement with the United States Department of Agriculture (USDA), Animal and Plant Inspection Services (APHIS) Wildlife Services (WS) in 2006. This agreement allows the USDA WS to conduct wildlife consultations (hazard assessments and control plans) at general aviation airport within Iowa. The USDA APHIS WS utilizes the information gathered from the general aviation airports to assist and develop ways to reduce threats to aircraft posed by the multitude of wildlife species including but not limited to deer, small rodents, birds, and other animals that threaten aviation safety. The following web site reference illustrates the various activities the USDA APHIS WS can assist your community:
www.aphis.usda.gov/wildlife_damage/

In addition to wildlife hazard assessments and wildlife control plans, a concerted effort should be made to catalog all wildlife concerns including wildlife strikes. All wildlife strikes should be reported to the FAA using Form 5200-7 and should include the type of strike and animal involved. This form can be found by using the following web site address:
<http://forms.faa.gov/forms/5200-7.pdf>



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5.2.b. Vegetation

In order to protect navigable airspace and the safe movement of aircraft, an inventory of existing vegetation within the runway approach areas and RPZs is recommended. Control measures to limit the height of trees, objects, and structures within these areas should be outlined in an AOZO. Efforts should be made to limit the existence of vegetation in proximity to airport environs due to height and wildlife attractant hazards. Planting species of vegetation with short growth heights can be an effective management tool. Species of vegetation should also be evaluated for potential wildlife habitat and food source attractants.

Vegetation can be an issue at airports due to either height and/or a wildlife attractant.

Consultation with the USDA WS is encouraged to manage site specific issues related to wildlife hazards and vegetation concerns. When evaluating vegetation concerns near airports, best management practices should be utilized to minimize potential wildlife attractants. These best management practices include but are not limited to the following:

- Limit planting bushy trees which provide protected roosting areas for birds and cover for small mammals. For example, ornamental trees such as Bradford Pears or evergreens such as spruce and fir trees should be avoided due to their dense foliage.
- Limit planting trees or vegetation, which produce fruits or berries used as a food source for birds or animals.
- Limit clusters of trees or vegetation, which provide a protected environment for birds and small mammals. For example a cluster of trees would be discouraged, while a planting of singular trees and shrubs spread over a large area would be more desirable.

Appendix M contains references to various Iowa laws that can be applied to environmental and wildlife related issues.



5.3 Acquisition and Notification Strategies

Acquisition, where feasible, is the preferred mitigation strategy.

As a prevention and mitigation technique, land acquisition and notification strategies can be used to remove, lower, or control existing land uses within Runway Protection Zones (RPZs) and areas very close to airport environs. As a preventive tool, acquisition or notification to property owners should take place prior to the development of a conflicting land use to limit future incompatible uses. Notification to property owner will alert an owner of potential compatibility concerns and may define a compensation for an impact identified as part of the easement. **Table 5-3** illustrates the key elements of acquisition and notification techniques to promote compatible land uses on or near airport environs. The primary techniques for acquisition and notification strategies include:

- Fee simple acquisitions
- Avigation and noise easements
- Non-suit covenants and hold harmless agreements
- Disclosure to real estate buyers

Each of these techniques is discussed in the following sections to illustrate the various options available to acquire property or notify property owners about land use concerns.



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Table 5-3 Acquisition and Notifications for Compatible Land Uses

Technique	Description	Key Value	Primary Shortcoming	When to Use
Fee Simple Acquisition	Purchase of land and all land use rights.	Complete control over future and pre-existing land uses is vested with airports; not reversible.	Often very costly with possible legal opposition. Land removed from tax roles.	Protection of RPZs and areas subject to high levels of noise impact. Effective to resolve existing problems and avoid future problems. FAA grant may be available for acquisition.
Avigation and Noise Easements	Obtain the rights to use or restrict use in a specified manner.	Provides more positive control than zoning. Less expensive than fee simple acquisitions, land may remain on active tax roles. Attached to the title of the property.	Does not completely alter existing incompatible land uses.	Used to compensate land owner for impacts and to gain right to remove obstructions (i.e. trim trees) and limit future growth on the property.
Non-Suit Covenant and Hold Harmless Agreement	Legal document between property owner and airport sponsor that is recorded with the property title.	Typically used in conjunction with an avigation or noise easement, property owner agrees to not hold the airport liable for any land use issues.	Does not alter existing incompatible land uses but merely acknowledges the existence of an issue. Does not limit future incompatibilities.	Used to record impacts and notify a property owner of the potential impacts while removing liability for an airport.
Disclosure to Real Estate Buyer	Legal document between property owner and airport sponsor that is recorded with the property title.	Informs the property owner of potential issues with developments near an airport and discloses the issues.	Does not alter existing or future land issues, is an informative type tool only.	Suggested for inclusion when a new subdivision or development is established near an airport.

Source: Mead & Hunt, Inc.



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5.3.a. Fee Simple Acquisition

Fee simple acquisition is the process by which an airport sponsor purchases property from the existing property owner in its entirety, including the structures and/or facilities on the property and the air and mineral rights. This is the most effective mitigation strategy to protect the airport, since the airport assumes sole ownership of the property, thus allowing the airport sponsor to maintain the property in a compatible manner. The FAA recommends airport sponsors own, at a minimum, the property within the RPZ and highly recommends ownership of the runway approach areas.

The federal process outlined in FAA AC 150/5100-17 Change 3, *Land Acquisition and Relocation Assistance for Airport Improvement Program Assisted Projects* and the *Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970* (P.L. 91-646) must be adhered to when property is purchased with federal funds. The FAA has developed a brochure entitled *Land Acquisition for Public Airports*, which summarizes the required process for land acquisition. AC 150/5100-17 Change 3, *Land Acquisition and Relocation Assistance for Airport Improvement Program Assisted Projects* can be found on the FAA web site at web address:

www.faa.gov/airports_airtraffic/airports/resources/advisory_circulars/media/150-5100-17/150_5100_17_chg6.pdf

Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970 (P.L. 91-646) can be found at web site address:

www.fhwa.dot.gov/realestate/act.htm

Property acquisition may be expensive, however, it is the most effective technique to address existing impacts and limit future development that can create incompatible land uses. If an airport has areas with many incompatible land uses, the airport sponsor may consider developing a specific plan for property acquisition.



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5.3.b. Avigation and Noise Easements

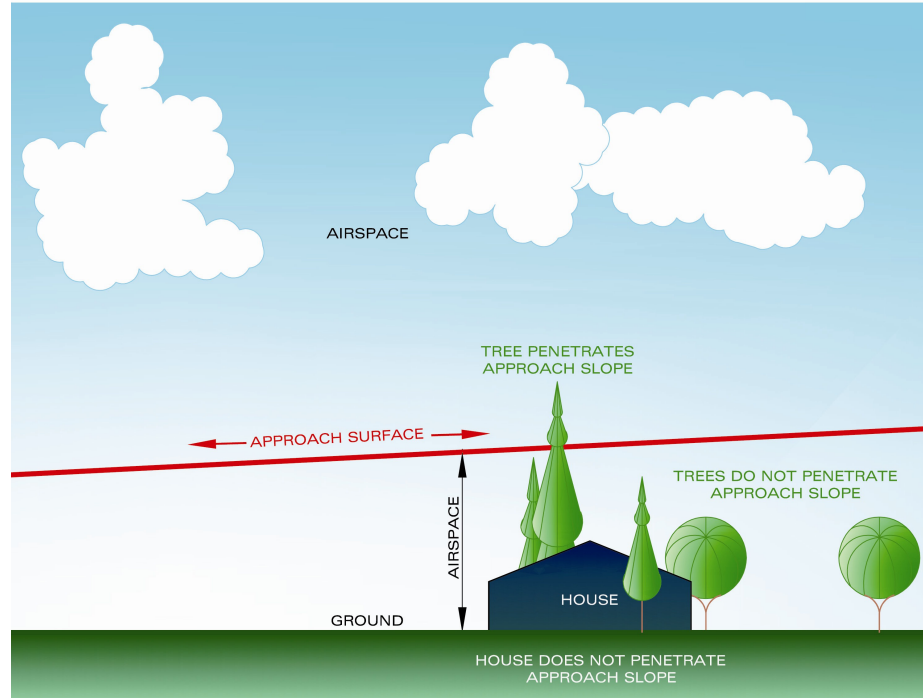
An easement is a right or privilege that one party has over the property of another party and is often purchased by an airport sponsor to protect the surrounding air space from incompatible development or encroachment within airport environs. An easement can address avigation or air rights, noise related to aircraft and airport operations, the right to obstruction free airspace, or any combination of these issues.

An easement is a legal document, which is attached to the property title and places existing and future property owners on notice that their property can be subject to noise impacts and other land use controls associated with the airport. Additionally, avigation easements can be utilized to mitigate existing incompatible land uses that are hazardous to airports and aircraft operations, such as trimming natural vegetation back to appropriate heights.

Avigation and noise easements should be used in conjunction with a broader land use plan and must be enforced to ensure their success. Easement acquisitions are governed by the same rules that apply to the fee simple process, including the *Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970*, and associated FAA ACs. Sample avigation and noise easements are contained in **Appendix G** and **Appendix F**.

Figure 5-2 illustrates a sample penetration to an approach surface, which an airport may work to remedy with an avigation easement.

Figure 5-2 Prevention and Mitigation Strategy Aviation Easement



Source: Mead & Hunt

5.3.c. Non-Suit Covenant and Hold Harmless Agreements

A non-suit covenant and hold harmless agreement are legal contracts between a property owner and an airport sponsor, which acknowledges the potential for incompatible land use issues. A non-suit covenant or hold harmless agreement are typically used in conjunction with an aviation and noise easement. These agreements legally record that a property owner has agreed not to sue an airport over noise or other land use incompatibility issues, because the property owner acknowledges the issues exist.

A non-suit covenant may monetarily compensate a property owner for the easement while a hold harmless agreement may not. Neither will alter incompatible land uses, nor limit future incompatibilities. **Appendix E** and **Appendix H** contain sample language for a non-suit covenant and hold harmless agreement, respectively.



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5.3.d. Disclosure to Real Estate Buyers

The term “buyer beware” is a common phrase when purchasing real estate. Many issues should be evaluated prior to the purchase and development of property near an airport. As noted in the previous sections, there are a number of planning, zoning, and land acquisition techniques used to guide and regulate land use activities within a community and near an airport. A buyer needs to be made aware of any land use compatibility issues that may arise on a piece of property near an airport, as well as the various easements, agreements and rights that may already be in place on the property. Local and state governments can require the disclosure of information to real estate buyers to communicate development concerns to potential buyers. **Appendix I** provides a copy of sample language for a Disclosure to Real Estate Buyers.

5.4 Noise Mitigation Strategies

Aircraft noise is a major concern for land use compatibility planning. Prevention and mitigation options are typically costly and can include but are not limited to: soundproofing, noise barriers, and land acquisition. Noise mitigation options are usually guided by AC 150/5020-1, *Noise Control and Compatibility Planning for Airport*, FAR Part 150, *Noise Study*, and the development of noise compatibility plans. As outlined in FAR Part 150, a noise study must follow a specific process and include key elements that include:

- Identification of noise and land use issues and problems
- Definition of current and future noise exposure
- Evaluation of alternative measures
- Development of a noise compatibility plan
- FAA approval of plan
- Development of an implementation and monitoring plan



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An FAR Part 150 study will benefit a community when the annual aircraft operations are greater than 90,000 propeller operations or 700 jet operations. Noise studies are typically applicable to larger general aviation airports or commercial service airports that experience these higher levels of operations. This level of activity can generate cumulative noise levels greater than 65 DNL, which typically extend beyond the airport property boundaries. The specific process, analysis, and associated deliverables of a FAR Part 150 study are not discussed in this document. A two-part FAR Part 150 noise compatibility checklist can be found on the FAA website at:

www.faa.gov/airports_airtraffic/airports/environmental/airport_noise/part_150/checklists/media/noise_exp_map_checklist_part_i.pdf

www.faa.gov/airports_airtraffic/airports/environmental/airport_noise/part_150/checklists/media/noise_comp_prog_checklist_part_ii.pdf

Based upon the results of the FAR Part 150 noise study, specific issues are identified for mitigation. Mitigation strategies such as: sound barriers, soundproofing, land acquisition, and the development of a master plan are implemented to promote airport land use compatibility. Typically these mitigation tools are utilized to address incompatible noise issues around airports. Land acquisition can be used as a corrective, as well as a preventive mitigation measure to maintain land use compatibility within the airport's environs.

5.4.a. Sound Barriers

Sound barriers can provide a prevention and mitigation tool to address noise impacts within the vicinity of airport operations. Sound barriers have limited applications and are typically used on airport property to shield noise-sensitive areas from the most intense levels of airport operations. When aircraft prepare for departure, the engine(s) are brought up to full power and then tested. This action, called a run-up, often creates a high decibel noise level at the end of the runway just prior to takeoff. If an airport has a noise-sensitive area near the run-up activity area, a sound barrier can be installed to shield an area from aircraft noise. Aircraft repair or maintenance facilities often test engines as well. A specific location for such facilities should be designated and a sound barrier can be used to contain aircraft noise.



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Sound barriers take many different forms. Coniferous trees and shrubs can be used as barriers but often provide limited sound reduction. They may also result in future airspace obstructions if not managed or maintained properly. Additionally, considerations should be given to the selection of species which do not contribute to wildlife concerns. These vegetation barriers can also act as visual barriers and are thus perceived as sound barriers. However, certain vegetation can also act as wildlife attractants so care should be taken to assess the impacts of this sort of sound barrier. Topographic features can also be used as barriers. Earthen berms are commonly used as barriers since they are relatively inexpensive to construct and maintain.

Man-made barriers are a costly option and often include wooden fencing or masonry walls. Fences are the most common type of noise barrier because they screen out both the view and sound. Masonry wall barriers are used in areas where there is a specific point of sound generation, such as an engine run-up area discussed above.

5.4.b. Sound Proofing

Soundproofing, though considered a prevention and mitigation measure, is a partial solution to noise issues. Soundproofing addresses the indoor environment, but does nothing to lower the outside noise levels. If a home is determined to be within an area that experiences a high level of aircraft noise, the house can be soundproofed to reduce the levels of noise within the structure. Windows and doors of a more dense construction can be installed, as can air conditioning units or a central air system, which reduce the need to open windows and allow noise to enter the structure. Additional roof and wall insulation can also be installed to soften the outside noise. Outdoor noise levels should be considered during the development of a compatible land use plan. Soundproofing will not alleviate noise interruptions outside the home. Therefore, it is important to recognize the limitations of this preventative and mitigation technique on outdoor environments.



5.5 Implementation

Airports are important community assets.

An airport sponsor, whether it is a commission, an authority, or a city administrator, will be most effective in ensuring compatible land use around airports if potential stakeholders understand the importance of airports and the need for compatible land use. In addition to city and county officials, local citizen involvement and understanding will assist in planning and mitigation techniques. Airport sponsors will need to work closely with city and county officials in developing comprehensive plan elements, zoning regulations, and airport overlay zoning ordinances that:

- Preserve the viability of airports
- Minimize and/or mitigate potential noise impacts on surrounding areas
- Preserve adequate space for airport operations, expansion, and safety zones
- Protect airports and airport environs from encroachment and incompatible land uses

Airport sponsors and managers also need to remain alert to proposed development or expansion projects within the airports jurisdictional boundary to ensure compatibility with the airport and the safe movement of aircraft. Effective zoning regulations and notification of proposed development will assist airport sponsors provide input. As airport sponsors develop long range plans, city and county planners need to be consulted.

Educating and informing local citizens of the importance of compatible land use around airports is essential.

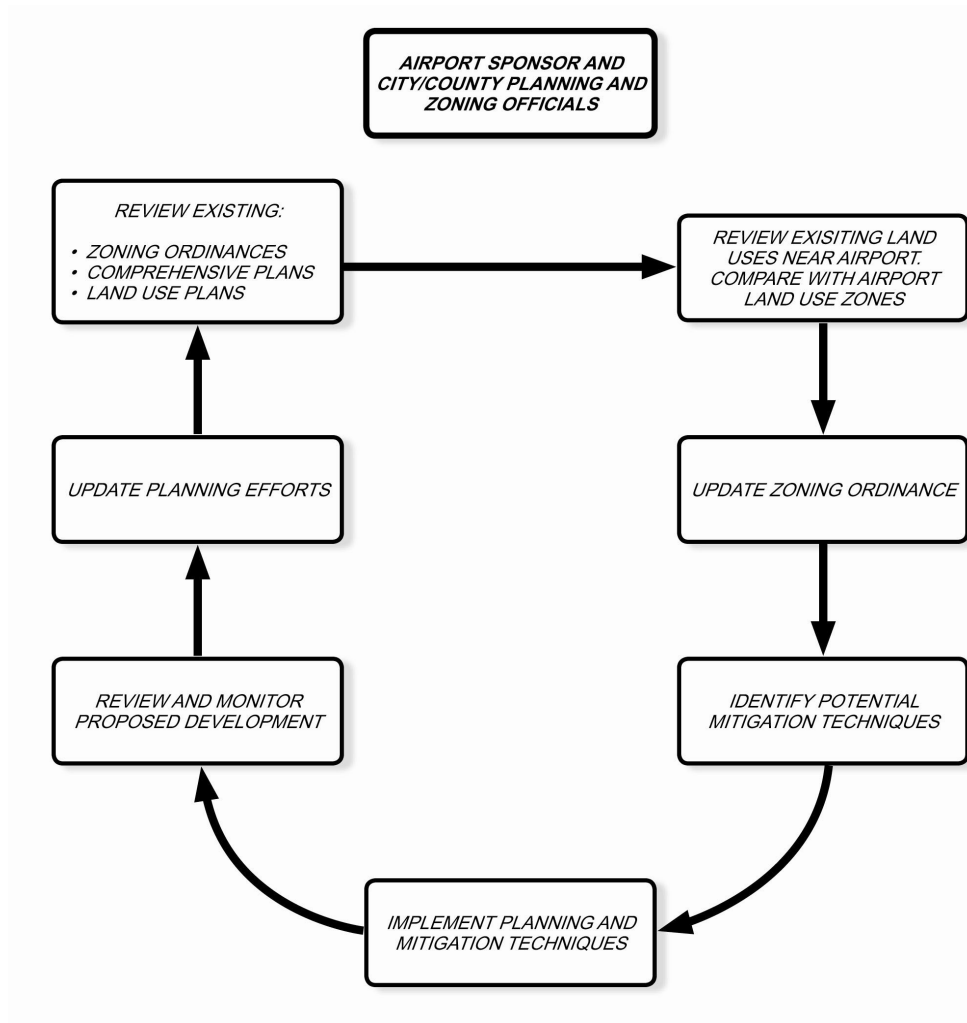
Educating and informing local citizens of the importance of compatible land uses around airports is essential to the preservation of the aviation system and the safety and quality of life of persons on the ground in the proximity of local airports. These individual citizens influence the decisions of planners and elected officials, who are directly responsible for the implementation of the planning techniques required for compatible land uses.



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Planning is a cyclical process that requires continual monitoring and updating to implement and maintain compatible land uses near airports. This process is necessary to continually evaluate and assess land use concerns as they change and evolve within individual communities. **Figure 5-3** illustrates the cyclical process of evaluating and planning.

Figure 5-3 Land Use Compatibility Planning Actions



Source: Mead & Hunt



5.5.a. Compatible Land Use Planning Assessment

Airport overlay zoning is intended to preserve and protect aviation infrastructure from the encroachment of incompatible land uses as previously discussed. Many airports have taken steps to address the issue of height concerns by adopting height limitation zoning. While beneficial, unless coupled with corresponding land use limitations, the full potential of airport overlay zoning is not completely realized and airports are left vulnerable to incompatible land use developments. These incompatible land uses can often endanger the safety of aircraft and airport operational areas and affect the quality of life for citizens in proximity to an airport.

As noted in Chapter 4, there are many land uses that, depending upon their proximity to an airport, may be compatible with airports. It has been noted that these uses should be assessed and have additional review to fully evaluate potential impacts or concerns. To assist with the implementation of a possible review process, a sample checklist has been developed to assist elected officials, planning commissions, zoning boards of appeals, and planners, as well as developers, in determining the compatibility of proposed land use development as it relates to airport environs. Local municipalities and developers need flexibility to allow development within specific airport overlay zoning districts to meet local needs while balancing safety concerns. The flexibility must be evaluated based upon the potential impacts associated with each land use compared to the needs of specific airport overlay zoning districts. The checklist is provided as a guide for individual municipal review. However, it is not meant to be an all-inclusive assessment of local land use concerns but rather a guide for local municipalities and specific use of this checklist is at the discretion of the local municipality.



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5.5.b. Implementation of Land Use Compatibility Planning Checklist

The land use compatibility planning checklist is designed to assist in the determination of land use compatibility. This form can be utilized as a guide to evaluate proposed development within the airport overlay zones. The questions in the checklist emphasize the primary concerns discussed in Chapter 3. **Appendix J** contains a copy of the sample Land Use Compatibility Planning Checklist. The checklist can be adapted to local needs.

The questions contained in the checklist are meant to alert the reviewer of potential concerns associated with the various land uses and provide a guide to evaluate the proposed land use as it relates to the individual development proposal. The checklist is not all inclusive, however it is meant to assist and guide local municipalities when siting development within airport environs. Answering the questions positively would indicate concerns related to these topics and would therefore suggest additional review is necessary. The items listed after each question illustrates the concerns that should be considered relative to the broader topic. Should these items demonstrate a significant impact, it is likely the use should be precluded. If the items are of minor significance or can be minimized and/or mitigated, the use may be permitted. This determination would be a local decision based upon the overall assessment/evaluation.

The checklist found in Appendix J is an important tool for cities when siting development near an airport.

Land use concerns to be evaluated can include but are not limited to:

Noise Sensitivity Related Issues

- Could the land use exceed compatible DLN noise levels of 65 or greater?
 - *Can the structure/land use be insulated to reduce noise impacts?*
 - *Are there outdoor activities that would be impacted by noise events?*
 - *Can landscaping material be utilized to mitigate possible noise exposure?*
 - *Can the structure and/or land use be shifted within the site to allow a more compatible location?*



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High Concentrations of People

- Could the land use attract a concentration of people?
 - *What is the size of concentration of people?*
 - *What is the frequency of use at any given time?*
 - *Are there outdoor activities associated with the use?*
 - *Can the structure and/or land use be shifted within the site to allow a more compatible location?*

Tall Structures

- Could the land use exceed height standards?
 - *Can the structure and/or land use be lowered?*
 - *Can the structure and/or land use be shifted within the site to allow a more compatible location?*
 - The applicant must submit an FAA Form 7460 to the FAA.
 - Response from the FAA regarding Form 7460 is attached to the report for reference. However, FAA determination does not guarantee local approval.

Visual Obstructions

- Could the land use cause light or glare reflection upward?
 - *Can installation of down shielded light fixtures be utilized?*
 - *Can the number of lighting fixtures be reduced while still illuminating the land use area?*
 - *Can lighting be configured in a linear manner such that it does not align with a runway or airport facility making it difficult for a pilot to distinguish?*
 - *Can reflective building materials (such as mirrored/reflective glass, solar panels, metal roofs, etc.) be limited within the vicinity of an airport?*
 - *Can areas of water be located away from the airport, due to possible reflection concerns?*



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- Could the land use create or emit smoke, steam, or dust?
 - *Can the structure and/or land use be shifted within the site so that the prevailing wind directions carries the smoke, steam, or dust, away from the airport to allow a more compatible land use?*
 - *Can the land use activity be changed to reduce/limit emissions of smoke, steam, etc.?*
 - Land uses that create or emit smoke and steam generally contain stacks that could also be a height concern.

Wildlife and Bird Attractants

- Could the land use have or create areas of standing water?
 - *Does the standing water have wildlife controls in place such as wires, balls, etc., across the water body that detracts birds from landing, roosting, or resting in the vicinity of an airport?*
 - *Can the detention area be constructed in such a manner that standing water is dispersed within 48 hours?*
 - If the standing water is associated with a detention area, can the detention area be located under ground or have the depth increased to reduce surface area?

Additional Considerations

- Could the land use contain flammable substances or materials?
 - *Can the structure and/or land use be shifted within the site to allow a more compatible location?*

- Could the land use cause a source of electrical, navigation, or radio interference?
 - *Has the applicant coordinated with the FAA, through the FAA Form 7460 to evaluate potential concerns?*
 - *Has the response from the FAA regarding Form 7460 been received? (Note: attach to report for reference)*
(FAA determination does not guarantee local approval)



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5.5.c. Example of Checklist Use

An example of how to utilize the Land Use Compatibility Checklist is outlined below.

A local community has adopted an Airport Overlay Zoning Ordinance that includes height and land use provisions. The community planning department oversees the implementation and regulation of the overlay ordinance. A developer approaches the local community in hopes of building a multi-family residential development near the local airport. The following would apply:

Background

- A developer proposes a multi-family residential development.
- It is proposed to be five stories in height.
- It is located in Zone D.

Preliminary Findings

- Per the Airport Land Use Compatibility Zones, Chapter 4 in this document, Airport Overlay Zoning Charts (**Table 4-4**).
 - A multi-family mid-rise development within Zone D would be a conditional use (**AR**), which requires further review.
- Therefore, the local municipality would review the development in greater detail and may utilize the Land Use Compatibility Checklist.

Use of Checklist

- The developer and the municipality complete the Checklist evaluating the eight land use concerns.
- Their initial review indicates:
 - One category with a – **Yes** answer in the column.
 - Could the land use attract a concentration of people? YES
 - Three categories with – **No** answers in the columns.
 - Could the land use create or emit smoke, steam, or dust? NO
 - Could the land use cause a source of electrical, navigation, or radio interference? NO



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- Could the land use contain flammable substances or materials? NO
- Three categories with – **Maybe** answers in the columns.
 - Could the land use exceed compatible DNL noise levels of 65 or greater? MAYBE
 - Could the land use exceed height standard? MAYBE
 - Could the land use cause light or glare obstructing visibility? MAYBE

Based upon the evaluation, it can be demonstrated that there are some concerns which should be further evaluated. For example:

Noise Sensitivity Related Issues

If the apartment building has outdoor facilities such as balconies, tennis courts, swimming pools or general recreational areas, aircraft and airport operational noise impacts may be a concern. Mitigation measures may be necessary for building materials or practices to reduce potential noise concerns.

High Concentration of People

The number of units associated with the structure should be evaluated to determine the size of concentrations of people in proximity to the airport. If the complex is to have five stories and only four units per story with an average occupancy of two persons, this would be a density of 40 persons. If the complex is to have five stories with 20 units per story and an average occupancy of two persons, this would result in density of 200 persons which is considerably more than the first scenario. The first scenario may be determined to be acceptable, while the second option may be deemed to have too significant of a density.



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Tall Structures

Typically a five story building in Zone D would not be a height concern, however, without additional review, this would not be readily determined. Assuming a standard of 10 feet of height per floor, the building would be approximately 50 feet in height and the typical allowable height in Zone D is 150 feet above the established airport elevation. However, if the topography is such that the property is elevated (i.e. located on a hill), the height of the structure would increase relative to allowable height limitations, and could therefore be a height concern. Consequently, indicating the existing ground elevation at the proposed development site, relative to the established airport elevation, is critical.

Visual Obstructions

The builder would need to supply a list of building materials to prevent the creation of light or glare that could obstruct the visibility of the pilot. For example, use of reflective glass should be discouraged or prohibited.

Summary of Findings

It is the municipality's decision to approve or deny the proposed project based upon an evaluation that attempts to limit, minimize, or mitigate the degree of impacts and concerns relating to airport operations and safe navigation of aircraft.

5.6 Summary

Many communities have some form of existing incompatible land use in proximity to a local airport. It is important to develop strategies to mitigate incompatibilities in order to maintain the safe and efficient use of airports, as well as protect the safety of local citizens on the ground. It is essential to provide an airport with a variety of mitigation and preservation techniques because each airport has its own unique set of land use issues. This effort begins with a solid understanding of the existing and future needs of the local airport as well as the local community. Using this assessment as a foundation, the airport sponsor and impacted jurisdictions can move forward to develop complementary comprehensive plans and airport master plans/airport layout plans which can guide the development of airport compatible land use that utilizes a number of techniques, including planning, zoning, land acquisition, and natural features mitigation.