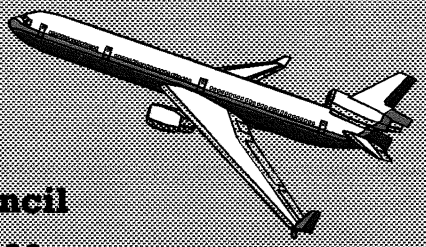
Compatible Land Use Planning Guide for Utah Airports

December 2000



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This report was prepared under the provisions of FAA Project Number 3-49-K851-MK and reflects the views of the Wasatch Front Regional Council, Mountainland Association of Governments and Utah Division of Aeronautics, who are responsible for the facts and accuracy of the data presented herein. The contents do not, necessarily, reflect the official views or policies of the Federal Aviation Administration (FAA) or other federal, state or local governmental agencies. Acceptance of this report by the FAA does not, in any way, constitute a commitment on the part of the United States to participate in any project, nor does it indicate that any recommendations are environmentally acceptable in accordance with applicable Public Laws.

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SECTION 1

BACKGROUND

Throughout the State of Utah, population growth and development are increasing the value of land surrounding airports. Today, much of this land is undeveloped; but, as the value increases and development pressures mount, the risk of development which is incompatible with the airport increases dramatically. Encroachment by incompatible development significantly threatens an airport's ability to expand to meet increased demand for services. In some cases, encroachment ultimately threatens the ability of the airport to remain operational. Incompatible development is primarily residential in nature but can also include schools, churches, roads, landfills, or virtually any kind of development that is to close to the airport itself.

Since 1945, the number of airports in the United States has declined constantly. Many of these airports were small private strips or military auxiliary fields that were no longer needed. Many airports were consolidated at locations that were thought to be safe from urban expansion for decades. Until recently, it seemed there were more airports than needed. The number of general aviation aircraft declined sharply from 1986 until 1994, when Congress passed legislation limiting airplane manufacturer's product liability. Since that time, the number of active general aviation airplanes has increased steadily. The very robust U.S. economy in this same period has helped accelerate this growth, and the FAA projects that general aviation, nationally, will continue to grow at a rate of about 1% per year for the foreseeable future. Our population growth in Utah is forecasted to exceed the national average for the next 20 years, and so is the growth in general aviation. The Wasatch Front Regional Council (WFRC) forecasts that active general aviation in the State of Utah will increase as follows over the next 20 years

Table 1 - Utah 2000-2020 General Aviation Forecast

Calendar Year	2000	2005	2010	2015	2020
Registered Airplanes	2,075	2,250	2,375	2,510	2,660
Active Airplanes	1,660	1,822	1,947	2,083	2,234
Flying Hours	250,660	282,487	309,652	339,578	370,910
Active Pilots	6,200	6,750	7,275	7,650	8,050

This growth in active airplanes, flying hours and active pilots will require that we maintain our current airports and expand some airports in the State Airports System to serve higher performance business jets, which are one of the fastest growing segments of general aviation. Such airplanes may require longer runways, new instrument approaches, and more modern facilities than smaller, piston-engine airplanes which are currently using most Utah airports. Emergence of new jet traffic at an airport usually indicates business growth in the service area or new clients for tourist and recreational services in the area.

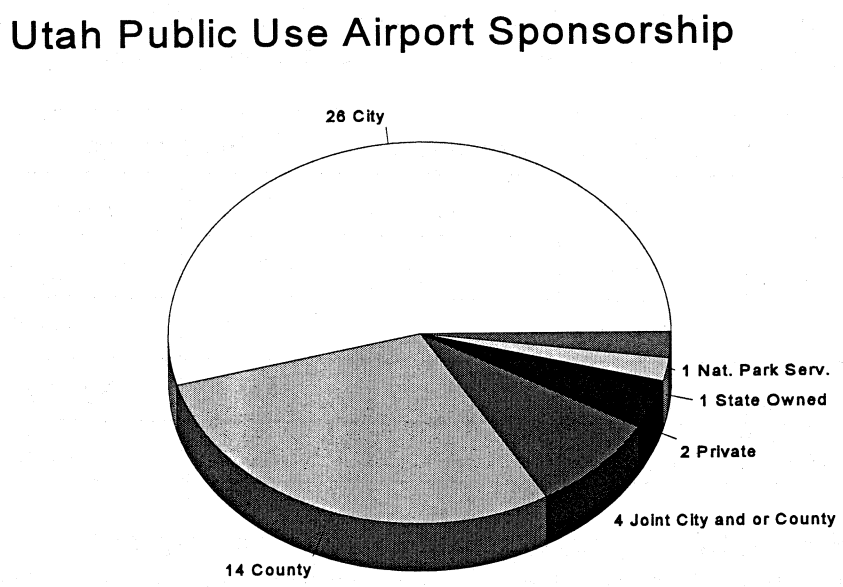
In 1974 the State of Utah had 169 airports. The classification of these airports were:

48 Public-use
12 Private public-use
100 Private restricted use
3 Military
1 Joint-use Civilian\Military
4 Heliports
1 Seaplane base

Airports which have closed in the area covered by the Metropolitan Airports System Plan are; Lehi Municipal airport, Draper airport, Vernon airport, Alta airport, and the Tooele Municipal airport. Some of these airports were closed because they were located improperly in the first place, but the majority closed as a result of residential encroachment. As residential development surrounded these airports, the surrounding land became more valuable for residential development and the airports eventually closed.

Currently, there are 54 airports in the Statewide Airport System. Three of these are military airports which are not open to the general public, and three are located in the navajo Nation. The 48 remaining airports are public-use airports which are licensed by the Utah Division of Aeronautics. Sponsorship of the 48 public use airports is as follows:

Figure 1



SECTION 2

PURPOSE AND SUMMARY

The purpose of this Compatible Land Use Planning Guide for Utah Airports is to provide Utah airport sponsors with a quick reference source for airport land use issues. Since most airport sponsors are municipal corporations who deal with land use and planning and zoning issues regularly, this guide is intended to supplement basic information, already available locally. It is also provides a useful listing of federal and state statutes, FAA regulations and publications, and a listing of similar material prepared by other states when dealing with airport land use issues.

Federal and State funds are essential for airports to remain safe and vital. The FAA and the State recognize the important linkage between airport and community planning and have made it an integral part of both grant programs. The FAA grant-in-aid program is described in FAA Order 5100.38, the *Airport Improvement Program Handbook*. Section 1521 of this Order requires airport sponsors receiving federal grants from the Airport Improvement Program (AIP) to ensure compatible use of land adjacent to or in the vicinity of the airport. Implicit in this assurance is that each airport receiving federal funds under AIP should have a compatible land use plan, specific to that airport, on file. Obviously, to have any validity, this plan must be tied to local zoning ordinances and procedures for the area surrounding the airport. The State requires similar protection through its grant assurances, which become binding when the sponsor receives state funds from the Utah Airport Construction Fund. The FAA and the State use these grant assurances to protect the large federal investment in airports and prevent incompatible land use.

Most of the responsibility and authority for compatible land use planning around airports lies with local communities. The purpose of this report is to provide tools and resources for those involved in land use planning and zoning near airports, and to illustrate the intricacies involved in airport zoning. The report will also identify the roles each level of government plays in relation to zoning authority surrounding airports.

SECTION 3

AIRPORT COMPATIBILITY ISSUES

Most citizen complaints about airports can be attributed to inadequate land use planning and zoning. Failure to adequately protect land surrounding airports has lead to the closer of more than 300 airports across the United States since 1995. The two most significant land use issues near airports involve safety and noise.

a. Safety Factors

One of the goals of the State and the FAA is that travel by air be as safe as possible. To accomplish this goal the FAA and State have placed a high priority on capital improvement projects that improve the safety of airports. Compatible land use is required for public safety, primarily to minimize the risk of injury to the general public in the event of an aviation accident. Controls are also necessary to ensure that land use consequences will not jeopardize the safe operation of aircraft in flight; increase the potential for additional aircraft damage or occupant injury in the event of an aviation accident, or interfere with effective emergency response to such an accident.

(1) For Persons on the Ground

The greatest potential risk to public health and safety associated with aircraft operations occurs during take-off and landing. Aviation safety experts have always recognized aircraft are more vulnerable to accidents during these two critical phases of flight. These phases of flight are concentrated at each airport in definable overflight areas. Overflight areas extend generally outward from each of the airport's runways. The length and shape of an area are based on a runway's capability and the type of aircraft using it.

The public safety element of aviation compatible land use is provided by establishing overlay zoning to limit certain activities to minimize the risk factors associated with aircraft operations. The potential risk to the public's health and safety is minimized by regulating those uses in areas near airports which can result in:

- The congregation of people
- The presence of flammable, explosive or hazardous material
- The presence of objects that could worsen the effects of an aircraft mishap

These type controls like any other land use regulations, are more effective when implemented before significant incompatible development exists in the airport's vicinity. The longer mitigation action is delayed, the greater its eventual cost. However, permitting the existence of uses incompatible with the public's health or safety can result in tragic consequences with far greater cost than would its mitigation.

(2) For Aircraft and Passengers

Land uses which can be harmful to aircraft and passengers include:

- The emission of smoke, light or other phenomenon that could obscure the pilot's vision during take-off and landing. Uses which might permit smoke or dust to drift across airport movement areas or approach and departure airspace are clearly incompatible and must be avoided. Due consideration must be given to local conditions, especially prevailing winds when siting such facilities.

- Likewise, facilities which emit light into the sky can prove hazardous to airplanes at night. Even temporary uses such as carnivals, use of searchlights at ceremonies and laser light shows should be restricted near the airport and underneath the approach airspace.

- Attracting birds or animals in areas where aircraft could strike them during take-off or landing either in-flight or on the runway.

  FAA Aviation Circular 150/5200-33, "Hazardous Wildlife Attractants on or Near Airports", provides specific guidance to airport sponsors on land uses that might act as an attractant to wildlife and prove hazardous to aircraft in flight. Section 1-3 of this reference establishes minimum distance standards between aircraft movement areas and the attractant as follows:

Airports serving piston-powered aircraft:	5,000 feet
Airports serving turbine-powered aircraft:	10,000 feet
Approach or Departure Airspace:	5 miles (if the attractant is likely to cause migration across the approach or departure airspace

  This reference also provides useful information on management of compatible uses, such as crops, golf courses, construction & demolition landfills, enclosed waste and composting facilities, etc.

- Vertical Obstacles

  The State of Utah height standard is based on the FAA Federal Aviation Regulation Part 77 *Objects Affecting Navigable Airspace*. The purpose of this regulation is to protect the navigable airspace for traffic patterns and approaches to airports. Imaginary surfaces are defined in relation to the airport and to each runway. The size of each imaginary surface is based on the design category of each runway and\or the instrument approach available or planned for the runway. Any object which penetrates the imaginary surface is considered an obstruction.

In addition to objects on the airport or in its approach corridors, vertical objects exceeding specified heights located anywhere near the airport must be analyzed by FAA to determine if they are obstacles to flight. FAR Part 77.13 establishes requirements for "Construction or alteration requiring notice" which might affect navigable airspace. This section also establishes vertical clearance requirements for other structures located near airports, including roads and railroads. In general, any structure exceeding 200 feet in height which is not shielded by an existing structure of greater height requires notification of FAA. Also, any structure which penetrates a 100:1 slope emanating from the nearest point of an airport runway may require notification of FAA. All community planning and zoning staff and commission members should have access to FAR Part 77 and be familiar with Subparts B and C.

The recent growth in telecommunications, particularly cellular telephones and High Definition (Digital) Television (HDTV), have fostered a boom in antenna construction. Normally, cellular telephone antennas can be placed in locations which do not compromise flight safety. Generally speaking, antennas less than 200 feet in height, or which are masked by permanent structures so as not to affect air navigation, are exempted from the requirements. All others require notification of FAA and a formal reply before permitting construction.

HDTV towers pose a special risk. These towers are generally very tall in comparison with microwave relay towers, typically 1000 feet, or higher. The siting of these towers is very critical and is carefully monitored by the Utah Division of Aeronautics (UDOA) and FAA. Local governments, particularly those in rural areas of the state, should be especially vigilant and notify UDOA or FAA if it appears these towers will be located near an airport or airway.

b. Noise Impacts

Noises associated with an airport can come directly from the airport surface or from aircraft taking-off, landing or in the airport approach pattern or airport traffic pattern. Generally speaking, aircraft operating en-route at higher altitudes do not generate noise which exceeds background levels.

(1) Airport Direct Noise Impacts.

Direct noise impacts are those which come from airplanes and equipment operating on the surface of an airport. These noises may be caused by:

- aircraft in the process of taking-off or landing
- taxiing aircraft
- ground testing of aircraft and engines

- ground support equipment for aircraft
- construction equipment

(2) Overflight Noise

Overflight noise is created by aircraft in flight. While overflight noise can occur during the en-route portion of flight, most overflight noise in the vicinity of airports is created during take-off and climb. The aircraft engine is usually operating near full power, or thrust, during take -off or go-around, and full power cannot be reduced by the pilot until a safe altitude is reached.

(3) Effects of Noise

The sound made by aircraft is a primary consideration in the determination of compatible land uses. Quieter aircraft engines, flight paths that detour around populated areas and changes in landing and takeoff procedures have reduced the impact of aircraft noise; but aircraft will always create a level of noise that will make some land uses in the proximity of airports incompatible.

(4) Airport Noise Compatibility

Noise compatible land use in the vicinity of airports is necessary to protect the public's health and welfare while preserving the airport's capability to efficiently meet aviation transportation needs. Encroachment of incompatible development in the vicinity of airports can be prevented, and further development controlled, by regulation of noise sensitive land uses. Utah State Statute (UCA 72-10-403) grants the authority for local government to specify and enforce land uses surrounding airports to prevent noise compatibility problems. Incompatible development, particularly residential development near airports, will inevitably create a body of resident activists who are annoyed by the noise they are being subjected to from normal operation of the airport. These residents will create pressures on their elected officials and the airport to decrease, limit or prevent aircraft operations. This product of incompatible development will adversely impact the airport's capacity improvement plans, particularly runway extensions or additions, that are necessary to meet growth. Limiting flight operations to certain runways, fight routes, times of day or by aircraft type degrades the airport's efficiency and decreases its capacity. In most circumstances, the operators of public airports may not limit flight operations without approval by the FAA. Approval to limit operations that degrade capability or decease capacity may not always be granted and will aversely affect the airport's ability to compete for future capital improvement funds.

(5) Preventative Measures

To prevent noise compatibility problems, overlay zoning must be established to control or

prohibit noise sensitive land uses or activities in the vicinity of airports. While residential uses are the most noise sensitive, many other categories have uses that can also be impacted by airport noise. Noise compatibility controls should address current and future land use within specifically designated zones of airport generated noise exposure. Controls may limit selected uses, or only certain type activities within broader land use categories. The controls may establish specific sound attenuation construction methods and techniques in building codes; provide for noise disclosure statements for property sale, rental and lease; or require the grant of avigation easements.

Compatible land use regulations are more effective when implemented before significant incompatible development exists in the airport's vicinity. Noise and other land use controls can also be effectively used to mitigate impacts on existing incompatible uses. Mitigating existing impact, however, is usually significantly more expensive than preventative measures.

For local governments, enacting and enforcing these land use regulations can be one of their most challenging and potentially divisive issues. The first challenge is to determine how much sound is being generated and whether this actually constitutes adverse noise impacts. The next is to determine what controls to exercise on which land uses.

(6) Understanding Airport Noise

Aviation generated sound generally varies in intensity in direct proportion to distance from an airport's runways, traffic pattern and established departure or arrival routes. Noise impacts can result from single, multiple or cumulative sound events that interfere with individual human pursuits and activities. While sound can be objectively defined, noise is essentially a subjective term. The level that sound becomes annoying or objectionable remains a highly individualized interpretation. Human response to sound is so varied it can be nearly impossible to accurately assess. Individual life styles, pursuits and activities are key factors that influence response. Community values and demographics are major determinants of these individual factors. For this reason, local government must determine what method will best define their airport noise exposure areas, what uses are likely to be impacted and what land use controls will best serve their community's interests.

An airport noise map produced in accordance with 14 CFR Part 150 *Airport Noise Compatibility Planning,* is one method to determine an airport's noise exposure area. Federal Aviation Regulation (FAR) Part 150 provides guidance for complete airport noise compatibility planning. A key aspect is the development and preparation of airport noise exposure maps. Appendix A of FAR Part 150 establishes the standards, methods and procedures for producing these maps, and Table 1, Appendix A of Part 150, provides a table of compatible land uses around airports.

In Part 150, the FAA designates the Yearly Day-Night Average Sound Level (YDNL) as the standard, single system to measure airport noise and determine exposure of individuals. This standard generally provides a highly reliable relationship between projected exposure and surveyed reaction of people to noise. An approved map must show those areas of 65 DNL and higher exposure levels. Federal guidelines in FAR Part 150 consider all land uses below the 65 DNL exposure level to be compatible without restriction. This does not imply that residents, occupants or users in lower exposure areas will not find airport generated sound annoying and objectionable.

The 65 DNL noise contour at typical general aviation airports is very narrow and is centered on the runway itself. Generally, it expands slightly near the runway ends, but rarely extends beyond airport property. However, most general aviation airports in or near metropolitan areas support significant numbers of flight training operations. Student, proficiency and pilot upgrade flight training requires repetitive VFR traffic pattern operations. Many individuals residing in these areas will find these repetitive over-flights annoying and objectionable even though the operations produce sound exposure levels well below 65 DNL.

Very few general aviation airports require a FAR Part 150 study before preparing an airport overlay zone ordinance. Historically, most small and medium general aviation airports with no jet traffic contain the 65 DNL contour entirely on airport property. Section 7 of this report provides airport sponsors a method to identify an overlay zone and appropriate protection measures based on the airport's role and service level. The approach suggested and templates provided may simplify the task of preparing an overlay zone for small and medium general aviation airports.

c. Why Protect Airports?

Aviation is important to the economic health of the State of Utah and the quality of life of its citizens, businesses and visitors. It is in Utah's interest to preserve a system of airport that provides access for all regions of the State, to the nation's air transportation system, and regional/national emergency services. Even small general aviation airports represent the investment of millions of dollars of public funds. It is poor public policy to squander this investment of scarce resources by allowing incompatible development to occur in a way which threatens the viability of a public-use airport.

Finally, past investments in the airport by the FAA and the State were not without strings. When issuing grants, both the FAA and the Utah Division of Aeronautics required airport sponsors to give assurances that they would protect that investment by implementing a compatible land use plan for the airport. Generally, FAA grant assurances remain in force for a period of 20 years after the grant is issued, while State grant assurances remain in force for 10 years. Although enforcement action by either the state or FAA is rare, penalties for violation could include repayment of federal and state grant monies.

SECTION 4

INSTITUTIONAL ROLES AND RESPONSIBILITIES

The institutional ability to protect airports from incompatible development increases as one moves down the food chain. That is, most of the power to act resides at the local level.

a. FAA

The FAA programs and distributes federal funds appropriated by Congress for the Airport Improvement Program. FAA issues grants to sponsors of airports in the National Plan of Integrated Airport Systems (NPIAS) to perform eligible work, as defined in FAA Order 5100.38A, "Airport Improvement Program (AIP) Handbook" and other FAA directives. Upon issuance of each grant, FAA requires that airport sponsors certify that they will abide by all current FAA assurances, as well as the Uniform Relocation Act. FAA airport sponsor Assurances 20 "Hazard Removal and Mitigation" and 21 "Compatible Land Use" are in effect for all Utah airports which have received federal funding. These are included verbatim in Appendix A. Generally, FAA interprets the duration of a grant assurance to be the effective life of the item for which the grant was issued. In the case of pavement, this means a minimum of 20 years.

Under AIP, FAA also provides grants for acquisition of land or easements for airport expansion or protection. Generally, FAA views land purchases as a reimbursable expense and encourages sponsors to acquire land using local funds before seeking reimbursement. There are many good reasons for sponsors to proceed in this manner. First, if the cost of acquisition is in question, the sponsor is better off waiting until all is settled before applying for the FAA grant. Once issued, the FAA grant can only be increased 15%. In the past, some Utah sponsors have accepted FAA grants based on appraisals, only to have the court adjudge much higher values.

Finally, FAA is responsible for ensuring general compliance with FAA standards.

b. State Government

Title 72 of the Utah Code is the Transportation Code. Section 72-1-204 of the Code assigns the Operations Division of the Department of Transportation responsibility for aeronautical operations within the state. Title 72, Chapter 10 "Aeronautics", Part 1 is the *Uniform Aeronautical Regulatory Act*, which establishes the responsibilities and powers of the Department of Transportation in carrying out the remaining provisions. Part 2, *Uniform Airports Act* establishes the powers of the Operations Division in establishing, operating and maintaining airports. Part 3, *Federal Airport Funds Act* provides for..."the acceptance, channeling and disbursement of federal, state and other funds for the planning, acquisition, construction, maintenance, operation and regulation of airports and air navigation facilities." Part 4, *Airport Zoning Act* provides for removal of airport hazards and obstructions and for creation of airport zoning to prevent airport hazards and obstructions.

The Division of Aeronautics of the Utah Department of Transportation manages the Department's responsibilities under the Code. The Division receives and forwards all applications for federal assistance from airport sponsors and receives, channels and disburses all federal and state funds apportioned to airport sponsors. The division also inspects and certifies airports for public use in the State.

The Division also provides grants from the Utah Airport Construction Fund for projects at public-use airports and allocates funds from this source to match federal grants in accordance with current department policies.

c. Local Governments who are Airport Sponsors

Airport sponsors at public-use airports in the State who have received FAA or state grants are signatories to grant assurances that require protection of the airport from hazards to air navigation and incompatible development. Sponsors at NPIAS airports are required to have a compatible land use plan in place. Generally, this means that an airport overlay zone has been established with necessary controls to prevent encroachment, and that this overlay zone has been adopted by the governing body of the political subdivision. While specific measures in the ordinance are discretionary, adoption of the ordinance is not. Airport sponsors who do not have airport overlay zoning in place probably are in violation of federal and/or state assurances.

d. Local Governments who are not Airport Sponsors

Local governments, together with airport sponsors should work together to balance the preservation of airport infrastructure and the impact of aircraft operations. It is the responsibility of local jurisdictions to consider the impact of airport operations when making land use decisions as these decisions can have a direct effect on the health and safety of its constituents.

Section 72-1-403(2) of the Utah Code states:

> "(a) If an airport is owned or controlled by a political subdivision and any airport hazard area appertaining to the airport is located outside the territorial limits of the political subdivision, the political subdivision owning or controlling the airport and the political subdivision within which the airport hazard is located may, by ordinance or resolution duly adopted, create a joint airport zoning board.
> (b) The board shall have the same power to adopt, administer, and enforce airport zoning regulations applicable to the airport hazard area as that vested by subsection (1) in the political subdivision within which the area is located.
> (c) Each joint board shall have as members two representatives appointed by each political subdivision participating in its creation and in addition a chair elected by a majority of appointed members."

Frequently in Utah, airports are owned by cities and are located near city limits or outside city limits on land for which the county has planning and zoning authority. The same situation exists

in the urban area of the state where the airport influence area extends to two or more political subdivisions, both of which are cities. In these cases, it is very important that all political subdivisions work together to protect the airport from obstructions, hazards, and incompatible development. In Section 8, we have listed some of the airports in the urban area that are affected by this situation. Most airports contribute significantly to the economies of all political subdivisions in the airport influence area, and beyond. While the extent of this contribution may not be well known or documented, political subdivisions adjacent to the airport sponsor should cooperate and consult with the sponsor on zoning within the airport influence area. Joint airport zoning boards may contribute to this level of cooperation.

e. Property Owners and Developers

Property owners and developers who have interest in land near airports should be encouraged to work with city or county staff to develop zoning regulations which do not adversely impact property values or property rights. In those cases where impacts are unavoidable, city or county staff should attempt to mitigate the impact using techniques and tools described in Section 7 of this guide.

SECTION 5

AIRPORT COMPATIBLE LAND USE CHALLENGES

a. Development of Nearby Land

(1) Residential Encroachment

One of the most common and detrimental forms of incompatible land use surrounding airports is residential encroachment. Residential encroachment posses the greatest threat to airports because of the complaints generated by individuals. As residential uses expand into areas surrounding airports, residents inevitably express concerns regarding safety and noise. No airport is immune to the problem of residential encroachment. Thus, it is vital that proper zoning and planning for airports be put in place before problems arise. Residential encroachment greatly limits an airports potential by acquiring the land needed for expansion and by removing the buffer between the airport and residential neighborhoods. This buffer is important as it reduces the impact of aircraft noise and diminishes the possibility of an aircraft accident occurring within a residential area.

(2) Other Incompatible Development

Other types of incompatible development may also seriously threaten an airport's longevity. These may run the gamut from illegal to inadvisable.

FAA Aviation Circular 150/5300-13 "Airport Design" lists kinds of development that are not permitted within Runway Protection Zones (RPZ's). Since sponsors are required to own or control RPZ's, this is generally moot until a runway is extended or an RPZ is expanded to meet a higher level of service.

b. Errors in Planning and Zoning

(1) Planning horizon is too short

Sometimes, in growing communities, there is a failure to look beyond traditional planning horizons at the ultimate role and configuration of the airport. This is particularly true when the airport is expanding to meet demands by higher performance airplanes at the same time the community is expanding toward the airport. While each case is different, this pattern is fairly typical in Utah.

Communities should look at their airport as an economic engine and vital community asset and not allow incompatible development to occur that might threaten expansion of the airport to meet <u>future needs, as yet unidentified</u>. In other words, provide plenty of buffer around airports and don't allow developers or property owners to steer you away from doing the right thing.

Depending on the community 20, 30, or even 50 years may not be a long enough planning horizon. Communities should try to envision their communities at least 50 years in the future, and base airport protection plans on that vision.

(2) Inadequate or Outdated Airport Master Plans

The FAA requires that airport master plans be updated periodically to reflect the latest concepts for development of the airport. Generally, this means every 10 years, or so, the master plan will be formally updated. The airport layout plan can and should be updated much more frequently. The important point is that airport plans must be kept up to date, and any plans for expansion be coordinated with plans for the surrounding community. Communities working with outdated airport plans run a much greater risk of permitting incompatible development to occur in the airport influence area than communities whose airport plans are up-to-date and well publicized.

(3) Failure to Tie Airport Master Plan to General Plan and Economic Development Plan

Most airports in Utah have close ties to the community's or region's future economic development. Most communities are aware of this, but some are not. Studies which show the airport's contribution to the local economy are fairly straightforward and should be completed by a qualified consultant as soon as practicable. Results from such studies are usually surprising and can go a long way toward building broader support for the airport in the community.

The airport sponsor should reach out to all communities in the airport service area and tie the airport into each jurisdiction's economic development plan. Likewise, the airport master plan should reflect its broadest role in serving all communities in the airport's service area.

Unfortunately, this seldom the case. Most airport sponsors subsidize their airports from general fund revenue. Other communities in the airport service area, who enjoy benefits of the airport, seldom, if ever, contribute directly to airport operating expenses. Nevertheless, airport sponsors should continue to seek other indirect contributions to the airport from these communities, such as in kind services, surplus equipment, donation of materials, and other innovations. Business leaders, chambers of commerce and other economic development proponents should be informed of the potential role the airport can play in furthering their plans and encouraged to help broaden support for the airport in the community.

(4) Inadequate Zoning Regulations

While the FAA and the State of Utah may contribute up to 95% of the development cost at an airport, local zoning is the single most powerful tool to protect that investment from incompatible development.

There are two challenges to adequate zoning:

- Zoning plans which do not carefully consider compatibility with the airport
- Changes to effective zoning brought on by development pressures.

Adoption and preservation of proper and adequate zoning regulations within the airport influence area (defined elsewhere) is the single greatest method to protect airports from encroachment and incompatible development. Section 7 of this guide outlines various tools and techniques communities may use to preserve and protect airport zoning regulations; however, the most important factor is community resolve.

c. Political Issues

Airport land use issues are almost always wrapped in local politics. Land owners and developers within the airport influence area may argue that denying a re-zoning request denies them the highest and best use of their property and therefore constitutes a constructive "taking" by the community. Such parties may use political influence or elections to attempt to place those who agree with their position on the city council or county commission. Hopefully, communities under this kind of pressure will recognize the threat posed to the airport and resist the temptation to give in to pressure. Both the FAA and the Utah Division of Aeronautics monitor each sponsor's commitment to airport protection very carefully and weigh this factor when apportioning funds.

An even more difficult situation is presented when multiple jurisdictions have zoning authority within the airport influence area. In Utah, this generally involves a city and a county. In the urban area of the state, it may involve multiple cities. In the case of Wendover, it involves two states, two counties and two cities. In any event, these cases call for the ultimate in intergovernmental cooperation. All jurisdictions having planning and zoning authority within an airport influence area should adopt individual airport zoning ordinances which are tied to one another.

The political entity who is the airport sponsor should be granted considerable deference by surrounding jurisdictions and consulted on any questionable matters, particularly re-zoning requests. The airport manager should be consulted by city or county staff and planning and zoning commissions early in the process os approving zoning requests. In most cases, his reply will be "no impact". In cases where minor adjustments to the proposed development might remove any conflict, consulting the airport manager might avoid future expense and angst.

(1) Development Pressures and Tax Revenue

A jurisdiction's residential tax base is the largest source of general fund revenue, and expansion of this tax base is, generally, a major goal of administration. In a typical case, a city might have property around an airport zoned "light industrial" or "business park", both uses being generally compatible with airports. If demand for light industry or business doesn't develop as expected, pressure may arise to re-zone certain land for high density residential use, which is one of the least compatible uses.

Cities need to preserve and develop alternative land uses near airports that recognize a range of development possibilities. In the case cited above any number of other development possibilities existed other than high density residential

(2) Property Rights

Historically, Utah has given special emphasis to protection of individual property rights. That said, the state does have an effective eminent domain statute, and UDOT and other state agencies have been forced to use this tool frequently in highway projects. Certainly this is not the preferred strategy for airport sponsors; however, it is the tool of last resort when property absolutely must be held in fee title and the property owner is uncooperative.

d. Strategies to Meet these Challenges

The following sections of this guide provides a range of land use control options which might be used by airport sponsors to gain necessary control over property near airports. Each situation is different, and the degree of control necessary varies considerably within the airport influence area.

As has already been pointed out, prevention of incompatible development is much easier and less costly than remediation. Prevention of incompatible land use begins with good long range planning, vision and cooperation.

SECTION 6

IDENTIFICATION AND DESIGNATION OF AN AIRPORT OVERLAY ZONE

a. Elements of the Overlay Zone

Airport protection from incompatible development begins with preparation of an up-to-date and effective airport overlay zone, usually incorporated into the city or county code, thus giving it power of law. The overlay zone should stipulate sufficient controls to prevent incompatible development within the airport influence area. At small and medium general aviation airports the airport influence area may be defined as that area which underlies the airport's FAR Part 77 Horizontal Surface. If the airport has a precision instrument approach procedure, it may be advisable to extend the overlay zone to include the area under the FAR Part 77 Outer Approach Surface.

Every Airport Layout Plan drawing set must include:

- a top level scale drawing showing existing and proposed on-airport development and any non-standard conditions
- an airspace drawing showing Part 77 surfaces (horizontal, conical, approach, etc) and any obstructions to these surfaces
- approach plan and profile drawings showing any obstructions to the approach surfaces and remediation.
- Exhibit "A", or property map, which shows ownership or interest in parcels on or near the airport, plus any planned acquisitions in fee title or easement

If a Part 150 study has been completed for the airport, the Part 150 data will be presented as noise contours on a scale drawing of the airport area, similar to the top level ALP drawing. These drawings, plus a current zoning map for the area surrounding the airport are all that is required to prepare an overlay zone map.

The overlay zone should:

- prevent any vertical development which will penetrate FAR Part 77 surfaces
- prevent any development which would preclude the airport from meeting FAA airport design standards (FAA AC 150/5300-13) in the future.
- establish zones in the airport influence area that call for "no development", "limited development" and "controlled development". The size and degree of development controls applied in these areas will depend on the size and role of the airport and a local decision on the extent of restrictions necessary to protect the airport from incompatible development.

b. Identification of Airport Category

The overlay zone needed for any airport depends on the configuration of that airport, types of activity occurring at the airport, and the type and number of instrument approaches. Activity levels, runway lengths, based aircraft and instrument approach procedures were the primary inputs for categorizing general aviation airports. Airports are placed in into planning categories which meet the majority of factors listed below for each airport type. This is based on existing conditions. Airports which are predicted to have upgraded runways and/or instrument approach facilities, or sizable increases in activity should use the next larger planning map.

Small general aviation airports are defined as:

- Runway length less than 5,000 feet
- Less than 10,000 annual operations
- Visual approaches only
- Airport Reference Code (ARC) A-I/B-I
- Less than 20 based aircraft

Medium general aviation airports are defined as:

- Runway length between 5,000 and 7,000 feet
- 10,000 - 50,000 annual operations
- Non-precision instrument approach
- Airport Reference Code (ARC) B-II
- 20 - 100 based aircraft
- Occasional jet aircraft operations

Large general aviation airports are defined as:

- Runway length greater than 7,000 feet
- Greater than 50,000 annual operations
- Precision instrument approach procedure
- Airport Reference Code B-II thru D-III
- Greater than 100 based aircraft
- Frequent jet aircraft operations

Small Commercial Service airports are defined as:

- Publicly owned airports that have at least 2,500 but less than 10,000 passenger boardings each year and receive scheduled passenger service.

Table 2 provides a listing of each airport in the State and indicates the current airport category for planning purposes.

TABLE 2 - CLASSIFICATION OF UTAH AIRPORTS

AIRPORT	PLANNING CATEGORY	LONGEST RUNWAY	INSTRUMENT APPROACH	ANNUAL OPERATIONS	BASED AIRCRAFT
Beaver Municipal	Small GA	13-31 5100X75	None	1,200	6
Blanding Municipal	Medium GA	17-35 6000X75	NDB, GPS	9,500	6
Bluff	Small GA	03-21 2900X45	None	300	2
Tooele Valley Airport	Medium GA	16-34 5498X75	NDB, GPS	35,000	28
Brigham City Municipal Airport	Large GA	16-34 7500X75	NDB, GPS	18,500	89
Bryce Canyon	Small Com Service	03-21 7400X75	None	6,600	7
Bullfrog Basin	Small GA	01-19 3500X40	None	6,700	1
Cal Black Memorial	Small GA	01-19 5700X60	None	4,000	1
Canyonlands Field	Small Com Service	03-21 7100X75	VOR GPS	20,000	20
Price/Carbon County	Medium GA	18-36 8300X100	VOR GPS	13,200	22
Cedar City Regional	Large GA\Small Com Service	02-20 8652X150	ILS VOR GPS NDB	21,500	32
Delta Municipal	Medium GA	16-34 6011X75	VOR GPS	5,000	9
Duchesne Municipal	Small GA	16-34 5800x60	None	2,500	5
Dutch John	Small GA	11-29 6600X60	None	500	1
Eagle Mountain	Medium GA	17-35 10,000X100 Under Construction	None	200	1
Escalante Municipal	Small GA	12-30 5025X60	None	1,900	1
Fillmore	Small GA	04-22 5050X75	None	1,600	2
Green River Municipal	Small GA	13-31 5600X75	None	3,800	1
Hanksville	Small GA	08-26 5675X75	None	800	1
Heber City Muni - Russ Mcdonald Field	Medium GA	03-21 6900X75	GPS	33,000	88
Huntington	Small GA	07-25 4036X60	None	500	6
Hurricane	Small GA	18-36 3410X40	None	5,500	42

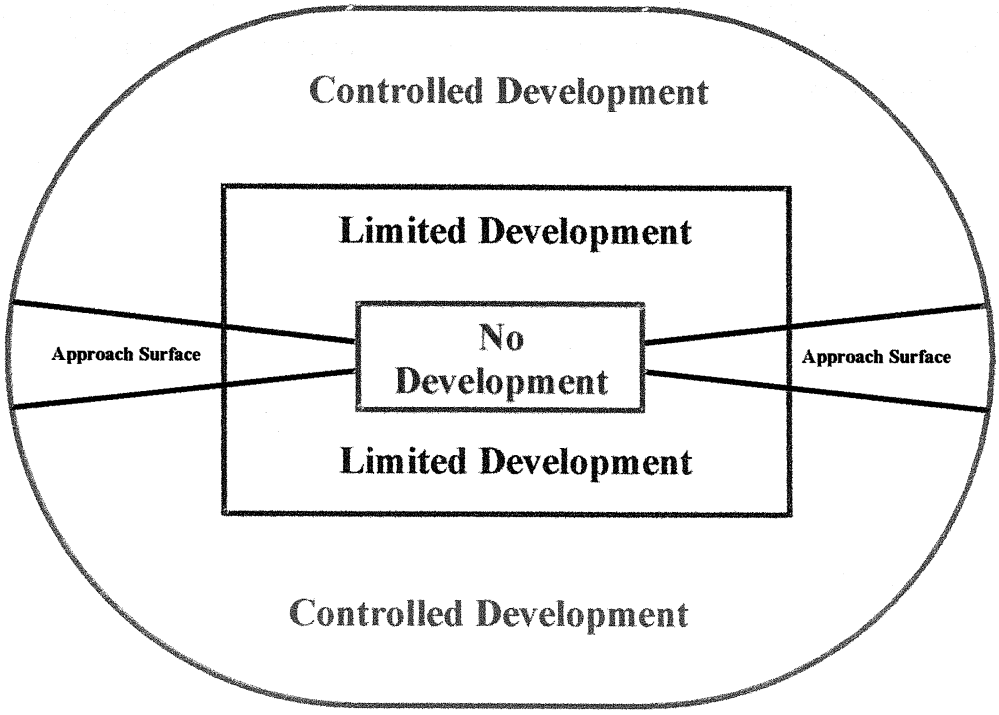
AIRPORT	PLANNING CATEGORY	LONGEST RUNWAY	INSTRUMENT APPROACH	ANNUAL OPERATIONS	BASED AIRCRAFT
Junction	Small GA	17-35 4505X60	None	250	1
Kanab Municipal	Small GA	01-19 5737X75	None	7,000	13
Logan-Cache	Large GA	17-35 5931X100	VOR GPS	112,000	111
Manila	Small GA	07-25 5300X60	None	500	1
Manti-Ephraim	Small GA	03-21 4868X75	None	2,000	5
Milford Municipal	Medium GA	16-34 5000X75	VOR GPS	7,000	7
Monticello	Small GA	16-34 4817X75	None	4,600	10
Morgan County	Small GA	03-21 3800X50	None	8,000	49
Mount Pleasant	Small GA	02-20 4260X60	None	2,300	3
Nephi Municipal	Small GA	16-34 4700X75	None	5,300	8
Ogden-Hinckley	Large GA	03-21 8103X150	ILS VOR GPS	106,000	294
Panguitch Municipal	Small GA	01-19 5700X75	None	1,200	7
Parowan	Small GA	04-22 5000X60	None	5,300	30
Provo Municipal	Large GA	13-31 8600X150	ILS VOR GPS	93,000	183
Richfield Municipal	Small GA	01-19 6645X75	None	6,100	20
Roosevelt Municipal	Medium GA	07-25 6500X75	VOR GPS	4,600	4
Salina-Gunnison	Small GA	02-20 3815X60	None	1,200	2
Salt Lake City Intl	Large Com Service	16L-34R 12004X150	ILS VOR GPS	339,000	421
Salt Lake City Muni 2	Medium GA	06-34 5860X100	GPS	68,500	238
Skypark	Medium GA	16-34 4700X70	None	46,000	179
Spanish Fork-Springville	Medium GA	12-30 5700X100	None	18,000	77
St George Municipal	Large GA\Small Com Service	06-34 6606X100	VOR GPS	58,400	120
Vernal	Large GA\Small Com Service	16-34 6601X150	VOR GPS	17,800	39
Wayne Wonderland	Small GA	13-31 5900X75	None	1,900	5
Wendover	Small Com Service	12-30 8000X100	VOR GPS	15,100	9

c. Planning Templates

The following planning templates can be used to establish basic development guidelines within the airport influence area. The guidelines have been scaled for small, medium, and large general aviation\small commercial service airports to show areas recommended for no development, limited development, and controlled development. The templates are based on accident probabilities, and aircraft noise levels within each of the areas. The recommendations for land use activities identify appropriate land uses and densities which work toward balancing the need for protection of airport infrastructure and the quality of life of surrounding communities. Land use and Activity tables on pages 26-31 provide recommendations on the compatibility of specific land uses and activities within the specified airport influence areas. Information is also provided on restrictions which should be placed on development within the airport influence areas.

Figure 2

General Planning Diagram



The "No Development" area, depicted in red, extends to the end of the runway protection zone (RPZ) and is the width of the approach surface at its intersection with the horizontal surface. Within this area, only development which is associated with airport operations should be

permitted, and all plans should be carefully reviewed to ensure that both exiting and future FAR Part 77 surfaces remain clear. Normally, this land is held in fee title by the airport sponsor.

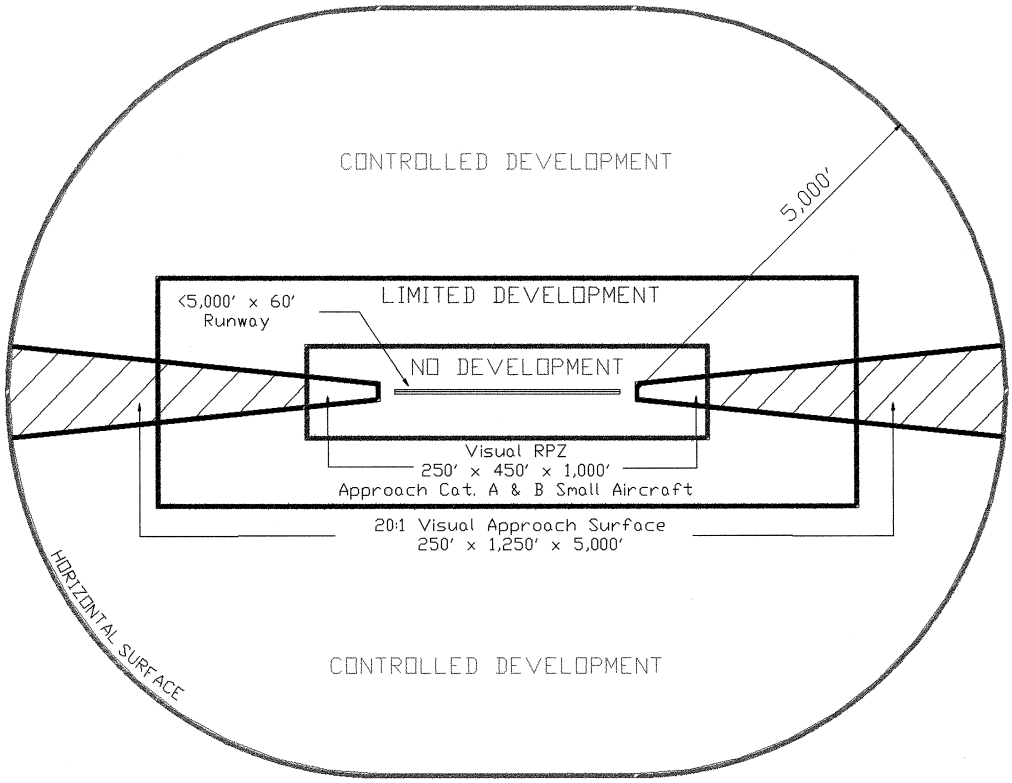
The "Limited Development" area, depicted in blue, extends 3,200 feet beyond each runway end for runways with 20:1 visual approach slopes; 5,300 feet for runways having 34:1 straight-in instrument approach slopes; and 7,700 feet for runways having 50:1 precision approach slopes. The width is the length of the airport's longest runway. This area should be restricted to development which is not sensitive to aircraft noise and would not create a potential hazard to aircraft operations.

The "Controlled Development" area is the area outside of the limited development area, but inside the FAR Part 77 Horizontal Surface. Within this area, virtually all forms of development can be compatible. However, there is still potential for impacts from airport related noise in this area. Where practical, communities should limit residential development to the lowest densities possible and consider requiring additional soundproofing and/or avigation easements, if warranted.

The "Approach Surface" depicts the FAR Part 77 approach surface. Additional discretion should be exercised in protecting these areas from incompatible development, particularly that portion which is also within the area of limited development.

Figure 3

Small General Aviation Airport Planning Template



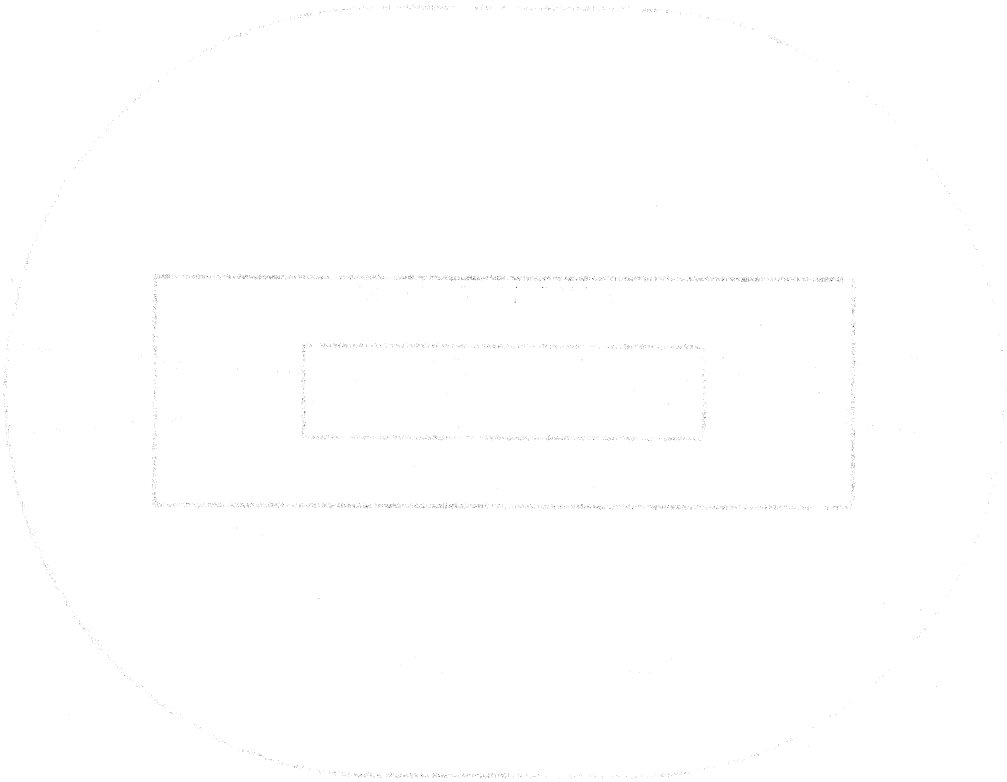
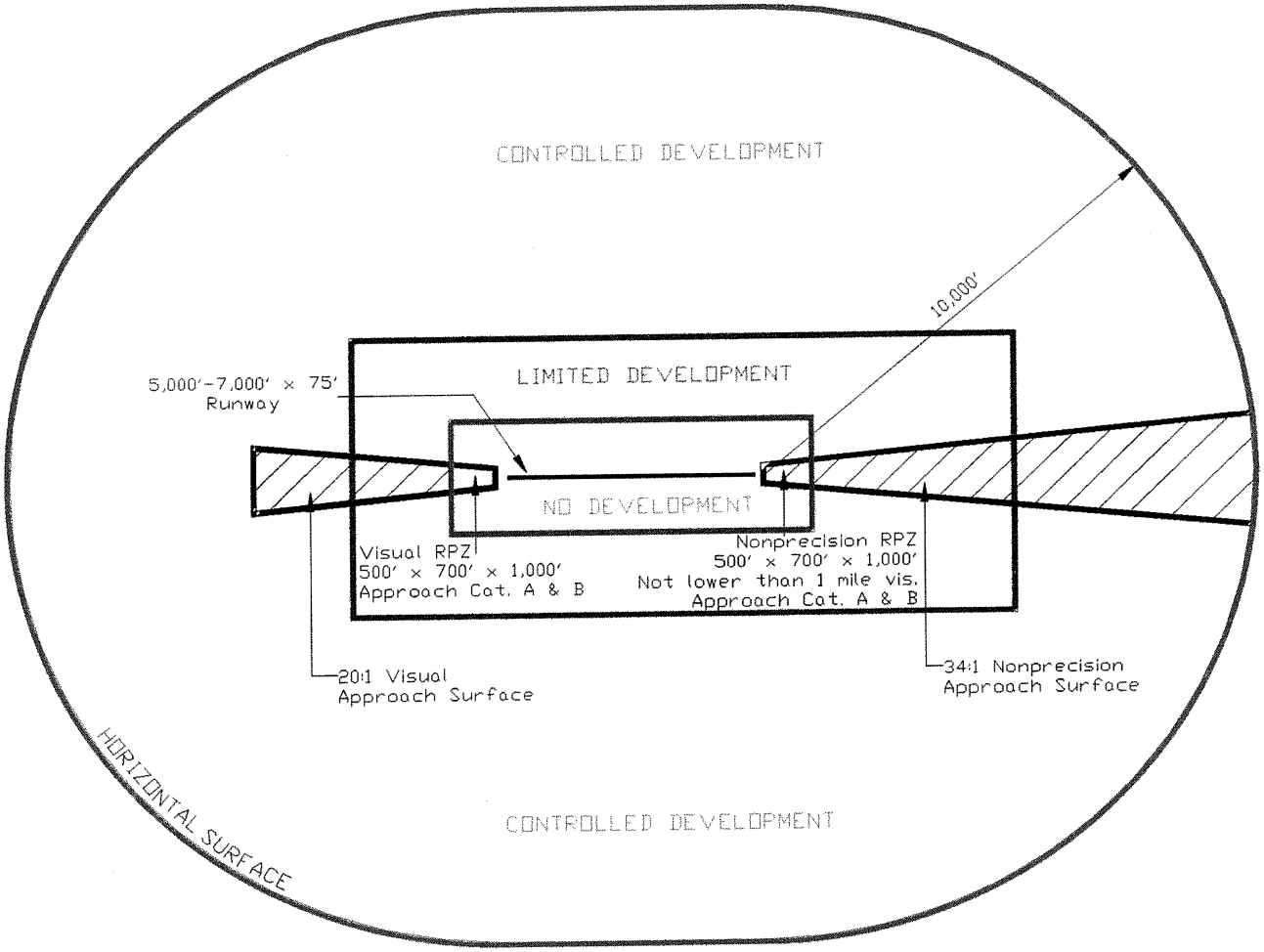


Figure 4

Medium General Aviation Airport Planning Template



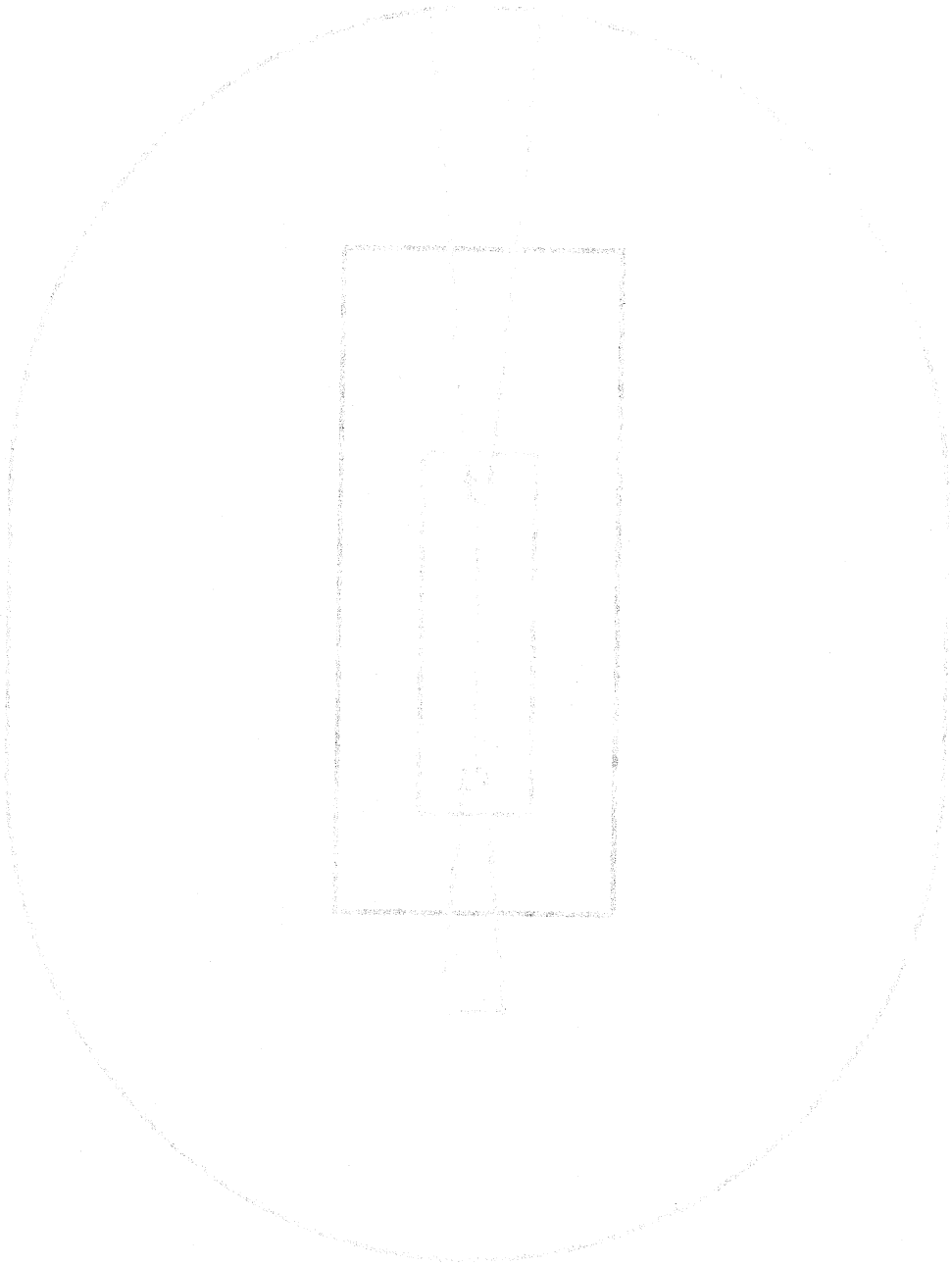
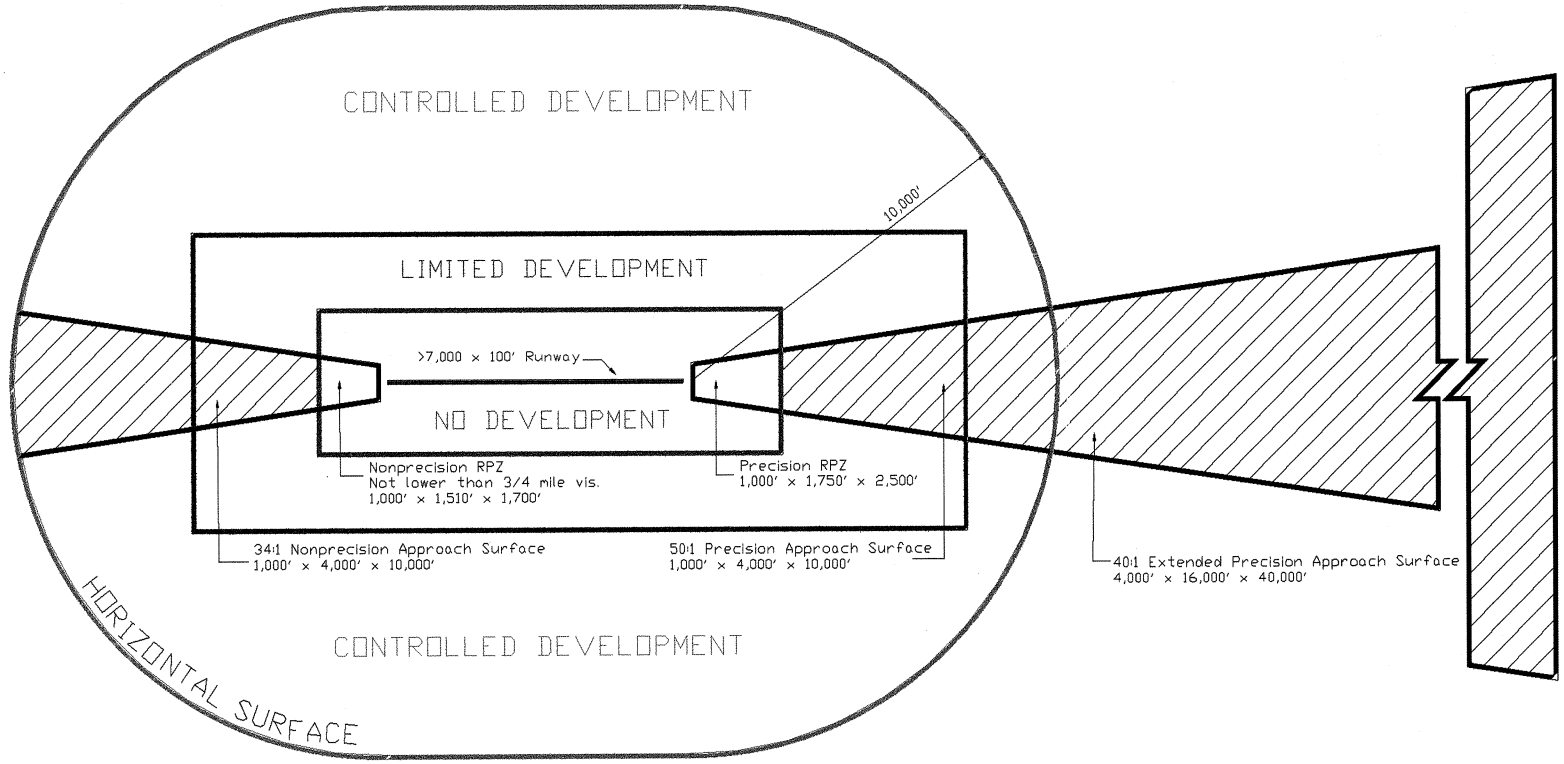


Figure 5

Large General Aviation \ Small Commercial Service Airport Planning Template



d. Recommended Land Uses

Table 3, which follows, identifies land uses that are generally compatible or incompatible for each area shown on the preceding templates. In some cases, a land use may be compatible or incompatible depending upon site specific conditions at that airport. These tables represent a generic and conservative approach to land use protection around airports. An individual approach to compatibility planning is required for each airport to fit with the existing political and land use framework.

TABLE 3 - RECOMMENDED LAND USES AND ACTIVITIES	NO DEVELOPMENT (RED)	LIMITED DEVELOPMENT (BLUE)	LIMITED DEVELOPMENT APPROACH SURFACE	CONTROLLED DEVELOPMENT (GREEN)	CONTROLLED DEVELOPMENT APPROACH SURFACE
RESIDENTIAL DEVELOPMENT					
Single Unites	N	I [1,3]	N	C [4]	I [2,3]
Duplexes	N	I [1,3]	N	C [4]	I [2,3]
Multi-Family Units	N	I [1,3]	N	C [4]	I [2,3]
Hotels and Motels	N	I [1,3]	N	C [4]	I [2,3]
Mobile Home Parks	N	N	N	C [4]	I [2,3]
Recreational Vehicle Parks	N	N	N	C [4]	I [2,3]
Other Residential	N	I [1,3]	N	C [4]	I [2,3]
OUTDOOR ACTIVITIES					
Religious Services and Assemblies	N	N	N	C [6,7]	U
Entertainment Assemblies	N	N	N	C [6,7]	U
Sports Event Assemblies	N	N	N	C [6,7]	U
Sports Arenas, Courts, Fields	N	N	N	C [6,7]	U
Circuses and Carnivals	N	N	N	C [6,7]	U
Amusement and Theme Parks	N	N	N	C [6,7]	U
Playgrounds and Neighborhood Parks	N	I [5]	N	C [6,7]	U
Community and Regional Parks	N	I [5]	N	C [6,7]	U

Y = Land use is compatible and should be permitted	**C** = Land use is generally compatible and should be permitted provided certain restrictions are complied with.	**I** = Land use is generally incompatible and should be prohibited. If a demonstrated community need for the development exists and no viable alternative exists, the use may be allowed provided specified conditions are met.	**U** = Land use is not clearly compatible or incompatible	**N** = Land use is not compatible and should be prohibited.

1-Limit densities to <25 people per acre.
2-Limit densities to <50 people per acre.
3-During site development shift structures away from runway centerline when possible
4-Cluster development to maximize open space
5-Prohibit high overhead lighting
6-Require downward shading of outdoor lighting
7-Obtain Avigation Easements
8-Obtain obstruction easements
9-Ensure permitted uses will not create large areas of standing water, or generate smoke, steam or other visual obstructions
10-Require the use of approved sound proofing techniques

TABLE 3 - RECOMMENDED LAND USES AND ACTIVITIES	NO DEVELOPMENT (RED)	LIMITED DEVELOPMENT (BLUE)	LIMITED DEVELOPMENT APPROACH SURFACE	CONTROLLED DEVELOPMENT (GREEN)	CONTROLLED DEVELOPMENT APPROACH SURFACE
INDOOR ACTIVITIES					
Churches, Mosques, Synagogues & Temples	N	N	N	N	I [3,4]
Theaters and Auditoriums	N	N	N	C	I [3,4]
Stadiums and Arenas	N	N	N	N	I [3,4]
Gymnasiums and Natatoriums	N	N	N	C	I [3,4]
SERVICES					
Hospitals and Nursing Homes	N	I	I	C	I [3,4]
Other Medical Facilities	N	I	I	C	I [3,4]
Day Care Facilities	N	I	I	C	I [3,4]
Educational Facilities	N	C	I	C	I [3,4]
Government Services	N	C	I	C	C
Correctional Institutions	N	C	C	C	C
Cemeteries	N	C	I	Y	C
Professional, Financial and Insurance	N	C	I	C	C
Business and Real Estate	N	C	C	Y	C
Repairs and Construction	N	C	C	Y	Y
Personnel and Miscellaneous	N	C	C	Y	Y

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TRANSPORTATION \ COMMUNICATION \ UTILITIES					
Passenger Facilities	I	Y	C	Y	Y
Cargo-Freight Facilities	I	Y	C	Y	Y
Road and Rail Facilities	I	Y	C	Y	Y
Vehicle Parking	I	Y	C	Y	Y
Vehicle Storage	N	Y	C	Y	Y
Telecommunications	N	Y	C	Y	Y
Broadcast Communications	N	Y	C	Y	Y
Electric Generating Plants	N	I	I	C	C
Sewer-Waste Water Treatment	N	C	C	Y	Y
Gas Utility Facilities	N	C	N	C	C
Electric Utility Facilities	N	C	I	C	C

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RETAIL TRADE					
Building Materials and Hardware	N	Y	C [3, 7]	Y	Y
Automotive, Farm and Marine Craft	N	Y	C [3, 7]	Y	Y
Apparel and General Merchandise	N	Y	C [3, 7]	Y	Y
Groceries and Food Stuff	N	C [5, 6, 8]	I [3, 7]	Y	Y
Eating and Drinking Establishments	N	C [5, 6, 8]	I [3, 7]	C	C
Shopping Malls and Centers	N	C [5, 6, 8]	I [3, 7]	C	C
Gas and Convenience Stores	N	C [5, 6, 8]	I [3, 7]	C	C
Liquified and Bottled Gas	N	I	I [3, 7]	C	C
WHOLESALE TRADE					
Home Furnishings and Building Materials	N	C	C [3, 7]	C	C
Food Products and General Merchandise	N	C	C [3, 7]	C	C
Liquified Gasses	N	I	N	C	C
Petroleum and Distillate Products	N	I	N	C	C
Industrial Chemicals	N	I	N	C	C
Explosive and Pyrotechnic Products	N	I	N	C	C
Other Wholesale Trade	N	C	C [3, 7]	C	C

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MANUFACTURING					
Food Products and Processing	N	C [8, 9]	C [8, 9]	Y	C
Textiles and Apparel	N	C [8, 9]	C [8, 9]	Y	C
Lumber and Wood Products	N	C [8, 9]	C [8, 9]	Y	C
Paper and Allied Products	N	C [8, 9]	C [8, 9]	Y	C
Chemicals and Allied Products	N	I [8, 9]	N	C	C
Petroleum Refining and Related Products	N	I [8, 9]	N	C	C
Explosive and Pyrotechnic Products	N	I [8, 9]	N	C	C
Rubber and Plastic Products	N	C [8, 9]	I [8, 9]	C	C
Clay and Glass Products	N	C [8, 9]	I [8, 9]	C	C
Metal Fabrication	N	C [8, 9]	I [8, 9]	C	C
Electronic and Optic Products	N	C [8, 9]	C [8, 9]	C	C
Professional and Scientific Products	N	C [8, 9]	C [8, 9]	C	C
Other Manufacturing	N	C [8, 9]	C [8, 9]	C	C

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RESOURCE PRODUCTION AND RECOVERY					
Livestock and Poultry Breeding	N	Y	C [8]	Y	Y
Animal and Poultry Breeding	N	Y	C [8]	Y	Y
Crop and Related Agricultural Production	N	Y	Y	Y	Y
Fishing and Aquiculture Activities	N	Y	C [8]	Y	Y
Forestry and Timber Production	N	Y	C [8]	Y	Y
Oil and Natural Gas Wells	N	Y	C [8]	Y	Y
Strip and Open Pit Mining	N	Y	C	Y	Y
Stone and Mineral Quarries	N	Y	C	Y	Y
Other Mining Activity	N	Y	C	Y	Y

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SECTION 7

LAND USE CONTROL MEASURES

a. Cooperative Measures to Acquire Needed Land or Control

(1) Fee-Simple Acquisition

Land acquisition is an important part of implementing a land use plans. Land used for runways, terminals, hangers, tie down areas and other airport associated uses must be owned in fee title by the airport sponsor. This ensures the airport owner maximum control over land most critical to the airport's operation. In addition, land adjacent to runway ends should be purchased to provide maximum control of runway approaches. Purchase of land within noise impacted areas, Runway Protection Zones, Obstacle Free Zones, and similar uses is eligible for FAA funding at NPIAS airports.

Purchase of additional land, beyond that absolutely required, is desirable, particularly if it can be resold or leased with usage restrictions, or can be used for public uses which are compatible with the airport. Examples of these uses are golf courses, industrial parks, and a variety of other uses which may be beneficial to the sponsor as well as the airport.

(2) Avigation Easements

An easement is defined as a right held by one person to make use of the land of another for a limited purpose. Avigation easements can be a cost-effective and permanent way to control land use around airports. Easements can be just as effective as acquiring land, and usually can be obtained at a much lower cost. Easements are preferable to zoning restrictions since they, usually are permanent, where zoning restrictions can be amended. A typical easement will: prevent any obstruction from being erected above the approach surface; give rights to cause noise, vibrations, fumes, dust and fuel particles; prohibit creation of electrical interference or unusual lighting; and grant right-of-entry to remove any structure or growth above the surface of the approach slope. Easements allow airport sponsors to purchase an interest in property that lies within the airport influence zone. Through easements, airport sponsors are able to control land uses around the airport but do not have the capital expense of acquiring the land. The landowner retains full ownership of the land, but is limited in developing or improving the land by the terms of the easement and may not bring cause against the airport for any named activity.

One problem exists with easements. Sometimes in areas of rapid development, easements can be very expensive, and often approach the cost of acquisition. Sponsors should compare the cost of fee title acquisition before deciding on an easement.

(3) Transfer or Purchase of Development Rights and Density Transfers

Transfer of Development Rights involves separate ownerships and the use of various rights associated with a parcel of land. Under this concept, some of the property owner's development rights are transferred to a different location where they may be used to intensify or enhance development.

(4) Developer Incentives and Agreements

Depending on the situation, developers may be offered incentives and offsets through agreement with the planning and zoning authority. This is an excellent way to compensate developers or property owners for value lost by restricting their development plans. This approach is very common in residential subdivision permitting, and a similar approach can be taken with airport proximity land use. Offsets and adjustments might include granting higher density in a particular sector of the development in exchange for no structures in a more critical area. Each situation is different, and the skill and judgement of the city or county planner is key in arriving at a mutually beneficial agreement. Also see Interim and Conditional Use Permits in the next section, which under some conditions, may be considered cooperative agreements.

(5) Real Estate Disclosure Statement

Real estate disclosure statements are simply a means to alert potential buyers that there is an airport in the vicinity, and that some overflight and noise impacts might be expected. This tool is valuable in residential subdivisions which are not found to be incompatible with the airport, but where notification of prospective buyers will prevent future problems. Normally the real estate disclosure statement is recorded and is attached to the warranty deed. Developers who are permitted to construct residential subdivisions where present <u>or future</u> airport noise might be a factor should be required to attach such disclosure statements as a condition for permitting the development.

b. Unilateral Measures and Use of Police Powers

(1) Zoning and Land-use Controls

The intent of federal and state statutes mandating the protection of airports, is that local government preserve the public's investment in aviation facilities. The statutes direct that this be accomplished by local government's land use regulation and zoning authority. Land-use controls can be adopted by establishing overlay zoning to control or prohibit noise sensitive land uses or incompatible activities in the vicinity of airports. While residential uses are the most noise sensitive, many other categories can also be adversely affected by airport operations. Noise compatibility controls should address current and future land use within specifically designated zones of airport generated noise exposure. Controls may limit selected uses or only certain type activities within broader land use

categories. The controls may establish specific sound attenuation construction methods and techniques in building codes; provide for noise disclosure statements for property sale, rental and lease; or require the granting of avigation easements. Controls may also establish the density of development which can occur in the airport influence area. Compatible land use regulations are more effective when implemented before significant incompatible development exists in the airport's vicinity. Mitigating an existing impact usually results in significantly increased costs for implementation.

The primary method of providing compatible land use protection for most airports in Utah is through the use of local zoning ordinances. The Utah state constitution gives local governments the power to regulate land use to protect the public health, safety, and welfare. The use of zoning for protection of airport has several advantages over other methods. One of these is cost. Through proper zoning, land around airports can be preserved in a compatible state with little or no capital investment. Zoning can also reduce the costs of future airport expansion by reducing land acquisition costs of undeveloped land.

Utah Law requires that initial zoning and changes to zoning be approved by the governing body of the jurisdiction having zoning authority. In Utah this means the City Council or County Commission has the ultimate authority to act on zoning requests brought forward by the planning and zoning commission.

(2) Interim and Conditional Use Permits

Interim uses for land surrounding airports can often be appropriate when development plans or increased activity is expected to be some years away. If funding is not available to acquire key parcels, low-intensity interim uses can preserve the surrounding land in an undeveloped state. This can delay the acquisition of development parcels to that period immediately prior to construction. These conditional uses are generally regulated by strict conditions, and they operate for a limited time. Land surrounding airports can often be used for agriculture, parking lots, and other low-intensity uses until such time as need for airport development or protection.

Conditional use permits must clearly specify the type of land use allowed and the term of permitted use to ensure that the property will be available when needed. Cooperation of landowners is essential for interim use permits, since they may deprive landowners of a portion of their property rights, necessitating compensation.

(3) Dedications and Extractions

Dedications and extractions are an exercise of police power local governments may use to protect airports from encroachment. Both are essentially impact fees paid with land rather than cash. These fees are paid by developers in exchange for development

approval or zoning changes. An extraction is basically identical to a dedication, except that extractions are *required* donations that cannot be substituted with cash payments.

Dedications and extractions can be a very cost-effective tools for local governments to preserve and protect airport facilities. However, both are subject to the *rational nexus,* in that the fee assessed on a development must bear a reasonable relationship to the increased tax burden on a community created by that development.

(4) Eminent Domain

Eminent Domain or condemnation is the power of government to take private property for public use without the owner's consent. Another use of the condemnation power occurs when a governmental body condemns (and purchases) the development rights in a given parcel of property. This may be done because the jurisdiction wants to preserve land surrounding the airport for compatible development or prevent development entirely. The current land use may continue so long as the owner wishes, but no further development can take place without permission of the governmental body.

Whatever interest the governmental body takes, it is required to pay just compensation for it. There have been few legislative attempts in the United States to control or define what is just compensation. In general, the judicial definition is that just compensation is the fair market value at the time of the taking. The market value may include not only the existing use value, but also the highest and best use to which the property may be put.

The use of Eminent Domain is usually the last resort in preserving land around airports. Legal costs always greatly increase total acquisition costs, while airport sponsors are often required by the courts to pay higher than appraised value for the land. Additionally, land acquired through condemnation is usually required to be developed immediately after acquisition, which requires considerable coordination to insure development funds are available.

c. Airport Strategies in Mitigating Noise Impacts

FAA AC/150-5020-1 Noise Control and Compatibility Planning for Airports is an excellent reference for airport sponsors. Chapter 3 of this reference describes various methods for airport proprietors to consider to minimize and mitigate noise impacts. These include the following:

- Denial of use for aircraft not meeting federal noise standards
- Capacity limits based on noise
- Noise abatement takeoff or approach procedures
- landing fees based on noise
- Noise barriers or shielding
- Purchase of noise critical land
- Complete or partial curfews

Airport sponsors may also be able to minimize community noise impacts by specifying operating procedures that tend to minimize noise. These may range from limitation on night operations, specifying certain traffic pattern procedures which minimize noise and requesting cooperation from airport users. Owners should be cautious not to unilaterally specify operational procedures which could violate Federal Aviation Regulations. FAA assistance should be sought when modification of operational procedures is necessary.

SECTION 8

AIRPORT LAND-USE ISSUES AT UTAH AIRPORTS

The following tables identify land use compatibility issues at all Utah airports:

Land use issues at each airport in the state were reviewed and summarized on the following table. Each airport was classified as a small, medium, or large general aviation airport, or as a small commercial service airport which determines the recommended planning template for each airport. The existence of a compatible land use plan and FAA FAR Part 77 zoning at each airport was listed. The potential for future encroachment and compatible land use problems was forecasted. Airports located in areas of rapid development were listed as having a higher potential for encroachment by incompatible land uses. The airport's growth potential was also listed. Airports which currently have significant numbers of operations by large aircraft, or are forecast to have these types of operations were classified as having a high growth potential. Land use complexity was also identified. Airports which are surrounded by land controlled by multiple jurisdictions, or which are surrounded by multiple incompatible uses were classified as highly complex.

Based on each of these items, recommendations are provided to help preserve land use compatibility or improve existing incompatible land uses.

TABLE 4 - LAND USE ISSUES AT UTAH AIRPORTS

AIRPORT	AIRPORT CLASS	COMPATIBLE LAND USE PLAN	PART 77 ZONING	INCOMPATIBLE DEVELOPMENT ENCROACHMENT POTENTIAL	AIRPORT GROWTH POTENTIAL	LAND USE COMPLEXITY	RECOMMENDED ACTION
Beaver Municipal	Small GA	No	No	Low	Low	Low	1,2,5
Blanding Municipal	Medium GA	Yes	Yes	Low	Low	Low	3,5
Bluff	Small GA	No	No	Low	Low	Low	1,2,5
Tooele Valley	Medium GA	In Process	In Process	Medium	Low	Medium	1,3,5
Brigham City Municipal	Large GA	Unknown	Yes	Low	Medium	Low	1,3,5
Bryce Canyon	Small CS	Yes	Yes	Medium	Medium	Low	3,4,5
Bullfrog Basin	Small GA	No	No	Low	Low	Low	1,2,3,4,5
Cal Black Memorial	Small GA	No	No	Low	Medium	Low	1,2,3,4,5
Canyonlands Field	Small CS	Yes	Unknown	Low	Medium	Low	2,3,4,5
Carbon County	Medium GA	Yes	No	Low	Medium	Low	2,5
Cedar City Regional	Small CS	Unknown	Unknown	Medium	High	Medium-High	1,2,3,4,5
Delta Municipal	Medium GA	No	Unknown	Low	Low	Low	1,2,3,5
Duchesne Municipal	Small GA	No	Yes	Low	Low	Low	1,2,3,5
Dutch John	Small GA	No	No	Low	Low	Low	1,2,3,4,5
Eagle Mountain	Medium GA	In Process	In Process	Low	Medium	Low	1,3,5
Escalante Municipal	Small GA	No	No	Low	Low	Low	1,2,3,4,5
Fillmore	Small GA	No	No	Low	Low	Low	1,2,3,5
Green River Municipal	Small GA	Yes	Yes	Low	Low	Low	3,5
Hanksville	Small GA	No	No	Low	Low	Low	1,2,5
Heber City Municipal	Medium GA	No	Yes	High	High	High	1,3,4,5
Huntington	Small GA	No	No	Low	Low	Low	1,2,5
Hurricane	Small GA	No	No	High	Medium	Medium	1,2,3,4,5
Junction	Small GA	No	No	Low	Low	Low	1,2,5
Kanab Municipal	Small GA	No	Yes	Medium	Low	Medium	1,2,3,5
Logan-Cache	Large GA	No	Yes	High	High	Medium-High	2,3,4,5

TABLE 4 - LAND USE ISSUES AT UTAH AIRPORTS

AIRPORT	AIRPORT CLASS	COMPATIBLE LAND USE PLAN	PART 77 ZONING	INCOMPATIBLE DEVELOPMENT ENCROACHMENT POTENTIAL	AIRPORT GROWTH POTENTIAL	LAND USE COMPLEXITY	RECOMMENDED ACTION
Manila	Small GA	No	No	Low	Low	Low	1,2,5
Manti-Ephraim	Small GA	Yes	No	Low	Low	Low	2,5
Milford Municipal	Small GA	No	No	Low	Low	Low	1,2,5
Monticello	Small GA	No	No	Low	Low	Low	1,2,5
Morgan County	Small GA	No	No	High	Low	High	1,2,3,4
Mount Pleasant	Small GA	No	No	Low	Low	Low	1,2,5
Nephi Municipal	Small GA	Yes	No	Medium	Low	Medium	2,3,4,5
Ogden-Hinckley	Large GA	No	No	Medium	Low	High	1,2,4
Panguitch Municipal	Small GA	No	Unknown	Low	Low	Low	1,2,5
Parowan	Small GA	Yes	Yes	Medium-High	Medium	Medium	1,2,5
Provo Municipal	Large GA	Yes	Yes	Medium	High	Medium	3,4
Richfield Municipal	Small GA	Yes	Yes	Medium	Medium	Medium	3,4,5
Roosevelt Municipal	Small GA	Yes	In Process	Low	Low	Low	2,3,5
Salina-Gunnison	Small GA	No	No	Low	Low	Low	1,2,5
Salt Lake City Int	Large CS	Yes	Yes	Low	Low	Medium	5,6
Salt Lake City Muni 2	Medium GA	Yes	Yes	High	Low	High	3,4,5
Skypark	Medium GA	No	No	High	Low	High	1,2,3
Spanish Fork-Springville	Medium GA	No	Yes	Medium	Low	Medium	1,3
St George Municipal	Small CS	Yes	Yes	High	High	Medium	3,4,5
St. George - New	Small CS	No	No	High	High	High	1,2,3,4,5
Vernal	Small CS	Yes	Yes	Medium	Medium	Medium	3,4,5
Wayne Wonderland	Small GA	No	No	Low	Low	Low	1,2,5
Wendover	Small CS	Yes	Yes	Low	Low	Low	6

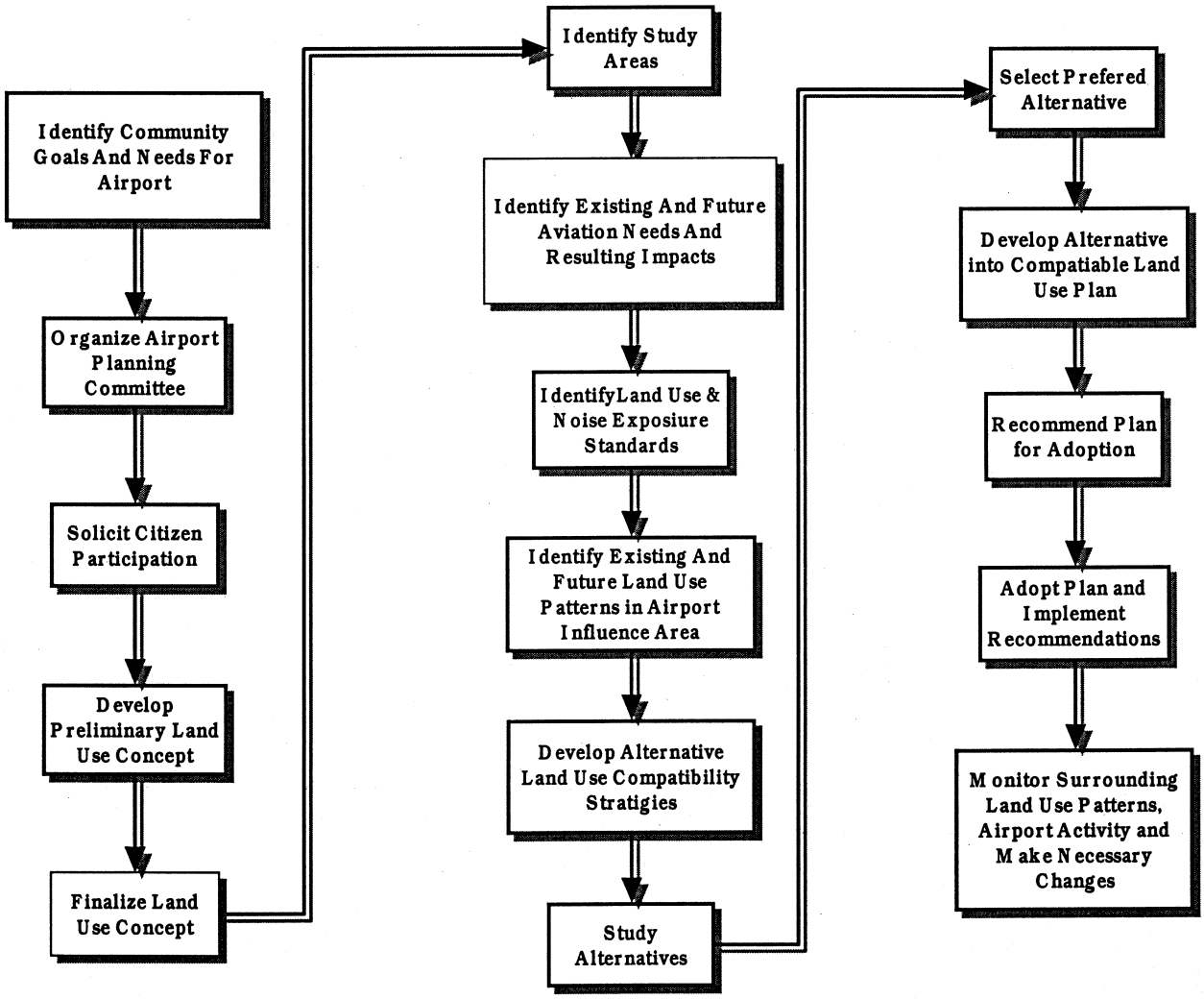
1 - Adopt zoning protecting airport from incompatible development.
2 - Enact ordinance protecting FAR Part 77 surfaces.
3 - Acquire land and\or easements around airport.
4 - Implement Aircraft Noise Abatement procedures.
5 - Review existing zoning and ordinance to ensure compatibility with future airport activity.
6 - Monitor development trends and enforce existing plans and zoning.

SECTION 9

LAND USE COMPATIBILITY PLANNING STEPS

The following figure is a summary of steps which should be followed, using the guidance and information contained in this guide to establish a compatible land use plan for individual airports.

Figure 6
Land Use Compatibility Planning Steps



APPENDIX A

FEDERAL REFERENCES

The following grant assurances are contained in all airport development grants issued by the FAA:

- Assurance 20, Hazard Removal and Mitigation:

  It (Airport Sponsor) will take appropriate action to assure that such terminal airspace as is required to protect instrument and visual operations to the airport (including established minimum flight altitudes) will be adequately cleared and protected by removing, lowering, relocating, marking, or lighting or otherwise mitigating existing airport hazards and by preventing the establishment or creation of future airport hazards.

- Assurance 21, Compatible Land Use:

  It (Airport Sponsor) will take appropriate action, to the extent reasonable, including the adoption of zoning laws, to restrict the use of land adjacent to or in the immediate vicinity of the airport to activities and purposes compatible with normal airport operations, including landing and takeoff of aircraft. In addition, if the project is for noise compatibility program implementation, it will not cause or permit any change in land use, within its jurisdiction, that will reduce its compatibility, with respect to the airport, of the noise compatibility program measures upon which Federal funds have been expended.

APPENDIX B

STATE REFERENCES

Utah Division of Aeronautics Grant Assurances

The following grant assurances are contained in all airport construction or maintenance grants issued by the Utah Division of Aeronautics:

> "Insofar as it is within its power and reasonably possible, the Sponsor will, either by the acquisition and retention of easements or other interests in or rights for the use of land or airspace or by the adoption and enforcement of zoning regulations, prevent the construction, erection, alteration, or growth of any structure, tree, or other object in the approach areas of the runway of the Airport, which would constitute an obstruction to air navigation according to the criteria or standards prescribe in Part 77 of the Federal Aviation Regulations, In addition, the Sponsor will not erect or permit the erection of any permanent structure or facility which would interfere materially with the use, operation, or future development of the Airport, in an portion of a runway approach area in which the Sponsor has acquired, or may hereafter acquire, property interests permitting it to so control the use made of the surface of the land. In addition the Sponsor will clear said area or areas of any existing structure of any natural growth which constitutes an obstruction to airspace within the standards established by said Part 77 unless exceptions to or deviations from the aforementioned obligations have been granted to it in writing by the State.
>
> Insofar as is within its power and to the extent reasonably possible, the Sponsor will take action to restrict the use of land adjacent to or in the immediate vicinity of the Airport to activities and purposes compatible with normal airport operations including landing and takeoff of aircraft.
>
> The Sponsor will maintain, at its own expense, the following aeronautical use items and activities: (2) Enforcement of zoning in the vicinity of airports to minimize environmental problems associated with aeronautical uses."

Extracts from the Utah Airport Zoning Act (Utah Code 72-10-400, et seq)

> **"72-10-402. Declaration with respect to airport hazards.** The Legislature finds that:
> (1) an airport hazard endangers the lives and property of users of the airport and of occupants of land in its vicinity;
> (2) an obstruction of the type that reduces the size of the area available for the landing, taking-off, and maneuvering of aircraft tends to destroy or impair the utility of the airport and the public investment in the airport;
> (3) the creation or establishment of an airport hazard is a public nuisance and an injury to the community served by the airport in question;

(4) it is necessary in the interest of the public health, public safety, and general welfare that the creation or establishment of airport hazards be prevented;
(5) this should be accomplished, to the extent legally possible, by exercise of the police power, without compensation; and
(6) both the prevention of the creation or establishment of airport hazards and the elimination, removal, alteration, mitigation, or marking and lighting of existing airport hazards are public purposes for which political subdivisions may raise and expend public funds and acquire land or property interests in land.

72-10-403. Airport zoning regulations -- Joint airport zoning board -- Powers of board -- Membership.
(1) (a) In order to prevent the creation or establishment of airport hazards, every political subdivision having an airport hazard area within its territorial limits may adopt, administer, and enforce, under the police power and in the manner and upon the conditions prescribed in this part, airport zoning regulations for the airport hazard area.
(b) The regulations may divide the area into zones, and, within the zones, specify the land uses permitted and regulate and restrict the height to which structures and trees may be erected or allowed to grow.
(2) (a) If an airport is owned or controlled by a political subdivision and any airport hazard area appertaining to the airport is located outside the territorial limits of the political subdivision, the political subdivision owning or controlling the airport and the political subdivision within which the airport hazard area is located may, by ordinance or resolution duly adopted, create a joint airport zoning board.
(b) The board shall have the same power to adopt, administer, and enforce airport zoning regulations applicable to the airport hazard area in question as that vested by Subsection (1) in the political subdivision within which the area is located.
(c) Each joint board shall have as members two representatives appointed by each political subdivision participating in its creation and in addition a chair elected by a majority of the appointed members.

72-10-404. Zoning ordinances -- Governing law in event of conflict.
(1) In the event that a political subdivision has adopted or adopts a comprehensive zoning ordinance regulating the height of buildings, any airport zoning regulations applicable to the same area or a portion of the area may be incorporated in and made a part of comprehensive zoning regulations, and be administered and enforced in connection with the comprehensive zoning regulations.
(2) In the event of conflict between any airport zoning regulations adopted under this part and any other regulations applicable to the same area, whether the conflict be with respect to the height of structures or trees, the use of land, or any other matter, and whether the other regulations were adopted by the political subdivision which adopted the airport zoning regulations or by some other political subdivision, the more stringent limitation or requirement shall govern and prevail.

72-10-405. Airport zoning regulations -- Adoption and amendment -- Airport zoning commission -- Powers and duties.
(1) (a) An airport zoning regulation may not be adopted, amended, or changed under this

part except by action of the legislative body of the political subdivision in question, or the joint board provided for in Subsection **72-10-403**(2), after a public hearing at which parties in interest and citizens shall have an opportunity to be heard.
(b) At least 15 days' notice of the hearing shall be published in an official paper, or a paper of general circulation, in the political subdivision or subdivisions in which is located the airport hazard area to be zoned.
(2) (a) Prior to the initial zoning of any airport hazard area under this part, the political subdivision or joint airport zoning board which is to adopt the regulations shall appoint a commission, to be known as the airport zoning commission, to recommend the boundaries of the various zones to be established and the regulations to be adopted.
(b) The commission shall make a preliminary report and hold public hearings before submitting its final report, and the legislative body of the political subdivision or the joint airport zoning board may not hold its public hearings or take other action until it has received the final report of the commission.
(c) If a comprehensive zoning commission already exists, it may be appointed as the airport zoning commission.

APPENDIX C

BIBLIOGRAPHY

FAA Advisory Circulars, Federal Aviation Regulations, and Orders applicable to Airport Planning:

AC 36-3F	Estimated Airplane Noise Levels in A-Weighted Decibels
AC 36-3G	Noise Levels for U.S. Certification and Foreign Aircraft
AC 36-4B	Noise Certification Handbook
AC 91-36C	Visual Flight Rules (VFR) Near Noise-Sensitive Areas
AC 91-53A	Noise Abatement Departure Procedures
AC 91-66	Noise Abatement for Helicopters
AC 70/7460-2	Proposed Construction
AC 150/5020-1	Noise Control and Compatibility Planning for Airports
AC 150/5070-3	Planning the Airport Industrial Park
AC 150/5070-6	Airport Master Plan
AC 150/5100-16A	Airport Improvement Program Grant Assurances Number One - Federal Grant Requirements
AC 150/5190-4A	A Model Zoning Ordinance to Limit Height of Objects Around Airports
AC 150/5300-13	Airport Design
AC 150/5320-14	Airport Landscaping for Noise Control Purposes
FAR PART 77	Objects Affecting Navigable Airspace
FAR PART 150	Airport Noise Compatibility Planning
FAR PART 154	Acquisition of Land for Public Airports Under the Airport and Airway Development Act of 1970
ORDER 1050.1	Policies and Procedures for Considering Environmental Impacts
ORDER 5050.4A	Airport Environmental Handbook
ORDER 5090.3B	Field Formulation of the National Plan of Integrated Airport Systems

Airport land-use reports prepared by others, and various source documents used in preparing this guide:

(1) A Guide for land Use Planning Around Airports in Wisconsin, 1989, State of Wisconsin, Department of Transportation

(2) Airports and Compatible Land Use Planning - An Introduction for Decision Makers, July 1998, Aviation Division, Washington State Department of Transportation

(3) Airport Zoning - Who Is Responsible? - An Airport Zoning Guide for Communities, July 1995, East West Gateway Coordinating Council, 911 Washington Avenue, St Louis, MO 63101

(4) AOPA's Guide to Land Use and Airport Noise,1999, AOPA Airport Support Program, Aircraft Owners and Pilots Association, 421 Aviation Way, Frederick, MD 21701

(5) General Aviation Airports - Unauthorized Land Use Highlights Need for Improved Oversight and Enforcement, GAO Report GAO/RCED-99-109, May 1999, United States General Accounting Office, Washington, DC 20548

(6) Methods and Techniques of Corridor Preservation - A Guide for Utah Practice, June 1999, Utah Department of Transportation, Research and Development Division, Planning Division, 4501 South 2700 West, Salt Lake City, UT 84119

APPENDIX D

GLOSSARY OF TERMS

The following terms pertaining to airport planning are used in this report. For a more complete list of terms and definitions, see FAA Aviation Circular 150/5300-13 (Airport Planning) and Federal Aviation Regulations Part 77.25 (Objects Affecting Navigable Airspace) and Part 150 (Airport Noise Compatibility Planning).

Airport Influence Area -	That land area near an airport that is directly influenced by activity at the airport; consequently, land use planning or zoning measures need to be taken to prevent incompatible development within this area. The affected area varies in size depending on the type of airport and flight activity that occurs there. (WFRC definition)
Approach Surface	A (trapezoidal) surface longitudinally centered on the extended runway centerline and extending outward and upward from each end of the primary surface. An approach surface is applied to each end of each runway based on the type of approach available or planned for that runway. (FAR Part 77.25 (d))
Airport Operation(s)	A landing or takeoff at the airport at which the facility is located. (A low approach below traffic pattern altitudes or a touch-and-go operation shall be counted as both a landing and a takeoff; i.e., two operations.) (FAA Order 1000.15A)
Airport Noise Abatement Program	A program designed to reduce noise around an airport through changes in the manner in which aircraft are operated.
Airport Sponsor (FAA)	Airport sponsors are: (1) public agencies owning and operating airports and (2) private airport owners and operators, such as individuals, partnerships and corporations which own/operate a reliever airport or public use airport that receives scheduled passenger service and enplanes 2,500 or more annual passengers. (FAA Order 5100.38A, Chapter 2)
Airport Sponsor (Utah)	Airport Sponsors are: any public agency, individual, partnership or corporation which owns and operates a public use airport which is licensed by the Utah Division of Aeronautics. (UDOA)
Aircraft Approach Category	A grouping of aircraft based on 1.3 times their stall speed in the landing configuration at their maximum certificated landing weight, as follows: Category A Speed less than 91 knots Category B Speed 91 to less than 121 knots

Category C	121 to less than 141 knots
Category D	141 to less than 166 knots
Category E	Speed greater than 166 knots

Airplane Design Group

A grouping of airplanes based on wingspan, as follows:

Group I	Up to but not including 49 feet (15 meters)
Group II	49 feet up to but not including 79 feet (24 meters)
Group III	79 feet up to but not including 118 feet (36 meters)
Group IV	118 feet up to but not including 171 feet (52 meters)
Group V	171 feet up to but not including 214 feet (65 meters)
Group VI	214 feet up to but not including 262 feet (80 meters)

Airport Reference Code

A coding system used to relate airport design criteria to the operational and physical characteristics of the airplanes intended to operate at the airport. (FAA AC 150/5300-13, "Airport Design")

The Airport Reference Code has two components, Aircraft Approach Category and Airplane Design Group, defined above. The Airport Reference Code is expressed as A-I, B-II, D-IV, etc, with the first letter indicating the Aircraft Approach Category followed by the Airplane Design Group. For airports with multiple runways or instrument approaches, each runway, taxiway and instrument approach may be designed to meet different standards, or the same standards my be applied to all aircraft movement areas and instrument approaches. When upgrading to a higher Airport Reference Code for individual runways, taxiways or instrument approaches, or when upgrading the entire airport to a higher service level, more stringent design standards must be applied. Table 1-1 of "Airport Design" identifies changes in airport design standards when upgrading the Airport Reference Code.

FAR Part 77

14 CFR 77 U.S.C. That part of the federal Aeronautics and Space statutes which deals with "Objects Affecting the Navigable Airspace", commonly referred to as Federal Aviation Regulations (FAR) Part 77. Part 77 "...establishes standards for determining obstructions in navigable airspace; sets forth requirements for notice to the (FAA) Administrator of certain proposed construction or alteration; provides for aeronautical studies of obstructions to air navigation, to determine their effect on the safe and efficient use of airspace; provides for public hearings on the hazardous effect of proposed construction or alteration on air navigation; and provides for establishment of antenna farms.

FAR Part 150	14 CFR 150 U.S.C. That part of the federal Aeronautics and Space statutes which deals with "Airport Noise Compatibility Planning", commonly referred to as Federal Aviation Regulations (FAR) Part 150. Part 150 "...prescribes the procedures, standards, and methodology governing the development, submission and review of airport noise exposure maps and airport noise compatibility programs, including the process for approving or disapproving those programs."
Large Airplane	An airplane with a certificated takeoff weight of more than 12,500 pounds. (FAA AC 150/5300-13 "Airport Design")
Average Day-Night Sound Level (DNL)	Day-night average sound level. The 24-hour average sound level in decibels, for the period from midnight to midnight, obtained after the addition of 10 decibels to sound levels for the periods between midnight and 7 a.m., and between 10 p.m. and midnight, local time. (FAR, Section 150.7). DNL is the commonly accepted measurement for assessing airport noise impacts.
Horizontal Surface	A horizontal plane 150 feet above the established airport elevation, the perimeter of which is constructed by swinging arcs of specified radii from the center of each end of the primary surface of each runway of each airport and connecting the adjacent arcs by lines tangent to those arcs. The radius of each arc is: 5000 feet for all runways designated as utility or visual; 10,000 feet for all other runways. The radius of the arc specified for each end of a runway shall have the same arithmetical value. That value will be the highest determined for either end of the runway. (FAR Part 77.25 (a))
Instrument Runway	A runway equipped with electronic and visual navigation aids and for which a straight-in (precision or non-precision) approach procedure has been approved or is planned. Where such implementation and procedure is intended to be installed, the runway is a "planned instrument runway". (FAA Order 1000.15A)
Based Airplanes	The number of airplanes which utilize a particular airport for basing or servicing more than half of the time when they are active.
Local Operation(s)	Aircraft operating in the local traffic pattern, or within sight of the tower; aircraft known to be departing for, or arriving from, flight in local practice areas located within a 20 mile radius of the control tower; aircraft executing simulated instrument approaches or low passes at the airport. (FAA Order 1000.15A)

Itinerant Operation(s)	All air carrier operations, and all operations other than local. (FAA Order 1000.15A)
Non-precision Instrument Runway	A runway having an existing or planned instrument approach procedure from which a straight-in landing is approved, but no electronic glide slope information is available and which no precision approach facilities are planned.
Object Free Area (OFA)	An area on the ground, centered on a runway, taxiway or taxilane centerline provided to enhance the safety of aircraft operations by having the area free of objects, except for objects that need to be located in the OFA for air navigation or aircraft ground maneuvering purposes (FAA AC 150/5300-13, Airport Design")
Obstacle Free Zone (OFZ)	the OFZ is the airspace below 150 feet above the established airport elevation and along the runway and extended runway centerline that is required to be clear of all objects, except for..(navigational objects)...to provide clearance protection for aircraft landing or taking off from the runway and for missed approaches. The OFZ is sub-divided into Runway OFZ, Inner-approach OFZ and Inner-transitional OFZ. The Inner-approach OFZ only applies to instrument runways with approach lighting, and the Inner-transitional OFZ only applies to runways with approach visibility minima lower than 3/4 of a mile.
Precision Instrument Runway	A runway having an existing or planned instrument approach that is aligned with the runway centerline and has electronic glide slope information for guidance of the descent of the aircraft to the touchdown point on the runway
Runway Safety Area-	A defined surface surrounding the runway prepared or suitable for reducing the risk of damage to airplanes in the event of an undershoot, overshoot or excursion from the runway. (FAA AC 150/5100-13, "Airport Design")
Runway Protection Zone-	An area off the runway end to enhance protection of people and property on the ground. (FAA AC 150/5300-13, "Airport Design")
Small Airplane	An airplane with a certificated takeoff weight of 12,500 pounds or less. (FAA AC 150/5300-13, "Airport Design")