KEVIN A. GANCI
kganci@gancilaw.com
Direct Line: (214) 443-6072

GANCI, LLP
ATTORNEYS AT LAW

825 MARKET STREET, SUITE 220
ALLEN, TEXAS 75013
PHONE: (214) 443-6001
FAX: (214) 644-2966

May 1, 2015

EMAIL: CITYCOUNCIL@MCKINNEYTEXAS.ORG
City of McKinney
City Council Members
Members Planning & Zoning Commission
McKinney, Texas 75069

Re: Agenda Item 14-151Z and 14-151Z6 set for the May 5, 2015 Meeting: Request to Rezone a Portion of the Property from "AG" – Agricultural District, "PD" – Planned Development District and "CC" – Corridor Commercial Overlay District to "SF5" – Single Family Residential District and "CC" – Corridor Commercial Overlay District; and Rezone a Portion of the Property from "PD" – Planned Development District and "CC" – Corridor Commercial Overlay District to "C2" – Local Commercial District and "CC" – Corridor Commercial Overlay District, Located Approximately 1,100 Feet West of Custer Road and on the South Side of U.S. Highway 380 (University Drive) ("the Subject Property").

AERO COUNTRY PROPERTY OWNERS ASSOCIATION SUPPLEMENT TO NOTICE OF OPPOSITION SUBMITTED IN CONNECTION WITH THE NOVEMBER 18, 2014 MEETING

Dear Council and Commission Members,

This firm and the Shields Legal Group represent the Aero Country Property Owners' Association ("ACPOA"), an association of owners of the approximately 22 acres within the City's Extra-Territorial Jurisdiction ("ETJ") and adjacent to Subject Property. Accordingly, the property represented by ACPOA is land encompassed in the Comprehensive Plan of the City of McKinney. (See Comprehensive Plan ("CP"), § 1, p. 11). ACPOA opposes the referenced zoning changes and, in accordance with the TxDot Airport Zoning Guidelines and Federal Aviation Administration ("FAA") guidelines, requests that the City Council vote to deny the rezoning applications and also requests that the City of McKinney implement airport-compatible land use zoning.

ACPOA incorporates by reference each of the objections which it asserted in the original Notice of Opposition which has been re-filed in connection with the May 5th Council Meeting and asserts the following additional arguments and objections in support of its opposition to the re-zoning request.

1. ***Relevant Background and Events following the November 18th Meeting***.

The current rezoning application was originally set for consideration on November 18, 2014. At the conclusion of the November 18th City Council Meeting, the McKinney City Council in an overwhelming majority of council members voted to table the proposal indefinitely. Several Council Members made requests that Megatel collaborate with ACPOA to try to reach agreement on a suitable solution to the land use dispute and come up with a proposal that is compatible with airport operations. City Council Member Kever specifically noted that the McKinney City Council voted to include, as part of its stewardship this term, establishing "compatible land use regulations for public use airports." Council Member Day plainly stated that "As it's currently laid out, with homes right here [bordering the Aero Country runway], I can't vote for it."

Despite receiving clear direction from the Council that Megatel work with ACPOA in an effort to develop compatible airport zoning for the Subject Property, Megatel has been non-responsive to all of ACPOA's collaboration attempts. This behavior is not only counter productive to responsible and safe development of property which borders an operating public use airport but is contrary to the McKinney City Council's request.

Without first attempting to seek even the slightest input from ACPOA, Megatel submitted an additional rezoning proposal on April 7, 2015. The additional rezoning proposal was submitted without prior notice to ACPOA or any of its legal representatives. The April 7th proposal is identical to the previous proposal tabled at the November 18th public hearing. It calls for residences to share a backyard fence-line with Aero Country's active runway. Megatel's failure to correct this obvious defect in the development plan is in blatant disregard of the City Council's stated concerns regarding the proposed rezoning.

The current proposal originally set for the April 7th Meeting was voluntarily removed from the April 7th Agenda and has been reset for consideration during the May 5, 2015 Meeting. The only difference between the November and April rezoning requests is that Megatel has provided what is known as a No Hazard Determination on two of the proposed structures to be constructed on two of the lots in the proposed 22 acre mixed use development.

2. ***The no hazard determination letters are only a first step in determining whether the structure poses a hazard and are not determinative of compatible zoning or compliance with FAA and Texas Department of Transportation Guidelines.***

The Texas Department of Transportation has issued Guidelines for Compatible Land Use Zoning/Hazard Zoning for Airports in Texas ("TxDot Airport Zoning Guidelines"). The Guidelines were developed to assist City Planners in connection with land use compatibility zoning in airport locations.

The Guidelines were "developed as a reference source for elected officials and city and county staff members responsible for assuring compatibility between an airport and the community it serves". *See* Introduction to TxDot Airport Zoning Guidelines, page 6. The Guidelines provide that "**Officials are urged to review Chapters 1 & 2 of these Guidelines before deciding which measures are best suited**

for their airport and community." *Id*. A true and correct copy of the relevant excerpts of TxDot Airport Zoning Guidelines Chapters 1 & 2 is attached as Exhibit A.[1]

In connection with residential development the TxDot Airport Zoning Guidelines provide in relevant part as follows:

> "Airport compatible land uses are uses of adjacent properties that are not adversely affected by airport operations. **Residential development is most sensitive to airport operations and is nearly always an incompatible land use if located close to an airport.**"

See TxDot Airport Zoning Guidelines and Chart of Compatible Uses, page 14 depicted in Figure 2-1.

There are two principal factors which must be assessed to determine how a particular piece of land can be developed for airport compatible use: (1) the height limitations on structures and, (2) the level of noise to which the land is exposed.

Height Limitations. The Federal Aviation Administration ("FAA") has determined the maximum heights that structures in the vicinity of an airport may be before they are identified as obstructions to air navigation. These heights are contained in Federal Aviation Regulations ("FAR") Part 77. *See* TxDot Airport Zoning Guidelines page 14 and Figure 2-2 Illustration. Structures obstructing any of the various parts of Part 77 surfaces or slopes may limit the airspace pilots normally expect to clear. *Id.*, page 35. It is generally accepted that the imaginary surfaces described in the applicable sections of FAR Part 77 are **the minimum areas that should be protected**. *See* TxDot Airport Zoning Guidelines, page 33.

Compatatibility. In addressing compatible land uses, the FAA and TxDot define "**Compatible Land Use**" of adjacent properties as follows:

> TxDot: "Airport compatible land uses are uses of adjacent properties that are not adversely affected by airport operations. **Residential development is most sensitive to airport operations and is nearly always an incompatible land use if located close to an airport**."

See TxDot Airport Zoning Guidelines, page 14 and Figure 2-1 Examples of Compatible Land Use.

> FAA: "Compatibility of land use is attained when the use of adjacent property neither adversely affects flight operations from the airport nor is itself adversely affected by such flight operations. In most cases, the adverse effect of flight operations on adjacent land results from exposure of noise sensitive development, **such as residential areas**, to aircraft **noise and vibration**."

Chapter 20. Compatible Land Use and Airspace Protection.

[1] The complete TxDot Airport Zoning Guidelines can be accessed by the going to the following link:
http://ftp.dot.state.tx.us/pub/txdotinfo/avn/avninfo/Airport_Compatibility_Guidelines.pdf

The TxDot Airport Zoning Guidelines and the general FAA guidelines on residential use of land on or near airport property is that such use is **incompatible** with airport operations because of the impact of aircraft noise and, in some cases, for reasons of safety, depending on the location of the property.

In terms of new development or construction, the FAA has entertained cases of "airpark" residential developments. The argument in favor of this exception is that owners in airparks will accept the impacts of living near the airport and will actually support the security and financial viability of the airport. However, the FAA position has been clear:

> *The FAA considers residential use by aircraft owners to be no different from any residential use, and finds it incompatible with the operation of a public use airport. It is common for private airparks to impose restrictions on the use of the airfield, such as night curfews, because aircraft owners have the same interest as other homeowners in minimizing noise and sleep disturbances at home. The FAA has no problem with such restrictions at private unobligated airparks operated by the resident owners for their own benefit. At federally obligated public-use airports, however, the existence of the incompatible land use is not acceptable.*

The City Council should bear in mind that Aero Country is a 24/7 airport with no curfews. Planes can and do fly anytime of the day or night, holidays notwithstanding. See letter in opposition delivered to the P&Z Commission by the ACPOA in July 2014. Among other things, the letter points out that in 1998, prior to this property being zoned for its current use, the City Council recommended there exist a 500 foot buffer zone between the runway and future structures to ensure a safety zone and noise buffer. As shown on the applicant's Powerpoint Presentation, the developer proposes placing residences less than 100 feet from a turf landing strip. The applicant has not addressed how the proposed rezoning or the concept plan is a compatible use or why the rezoning is an exception to the well established rule that residential developments are not compatible with airport operations and are by definition not compatible uses.

After safety concerns, noise exposure is the second principal reason that residential development is not a compatible use when such development is adjacent to an airport location.

> "Noise by definition, is sound that is loud, unpleasant, unexpected, or undesired. The sound produced by aircraft becomes noise when it disturbs people. The best way to minimize the adverse impact of noise is to separate people from the noise. Ideally, these are the areas where noise-sensitive land uses should be excluded."

See TxDot Airport Zoning Guidelines, page 16 and Figure 2-3 Decibel (dBA) levels of Common Sounds. Since Megatel has proposed constructing a residential development on property which is immediately adjacent to the Aero Country grass landing strip, the City Council can find that such land use is not compatible with airport operations.

Noise exposure was one of the principal concerns raised at the last meeting in November and Megatel has made no attempt to address such concerns by providing a noise study with its current submission. There are instruments which can measure and record sound levels over time. The measure most frequently used to describe sound levels over a period of time is the "day-night average sound level" or DNL. *See* TxDot Airport Zoning Guidelines, page 17. DNL represents the average noise received at a given location during the time measured or the yearly average of dBAs integrated over 24 hour periods.

Id. For flights between 10 pm and 7 am, a 10 dBA penality is added to the actual dBA value for each event because of the increased annoyance from overflights during the quieter periods when most people sleep. *Id.* Areas where residential development would be incompatible can be identified by plotting on a map the locations around the airport where DNL levels are high enough to cause annoyance. *Id.* No such noise study has been provided to the City Council and the City Council cannot make an informed decision on the compatibility of proposed residential use without it.

Absent a formal noise and safety study, the TxDot Airport Zoning Guidelines and the FAA's position on residential development around airports should be viewed as the authority on the health, safety, and wellness concerns implicated by the proposed rezoning of the subject property. As Tex. Loc. Gov't Code Ann. § 211.004(a)(3) requires the City Council to consider the health, safety, and wellness of its citizens those within the city's ETJ, the ACPOA submits that the City Council should place great weight on the guidelines and regulations of both TxDOT and the FAA governing appropriate land use of property adjacent to an active airport and deny the rezoning request.

3. ***Megatel's attempts to alleviate the City Council's and the ACPOA's concerns by including a notice letter to the residences bordering the ACPOA's runway are patently insufficient.***

As shown above, there are multiple authorities providing detailed information on zoning, planning, and the considerations required when developing property near a public-use airport. Megatel, without consulting any reliable authority and without collaborating with the ACPOA, has attempted to offer a "solution" to the concerns raised by the City Council during the November 18th public hearing by way of the Airport Disclosure Notice (the "Notice;" see Exhibit D to the Proposed Ordinance). The Notice is bromidic and wholly deficient for several reasons.

First, it is a simple notice designed to be delivered to prospective buyers. Such a notice would presumably be included in promotional material, allowing its information and intent to be obfuscated by the sales process. Other communities have had each resident sign waivers upon sale, acknowledge the airport in the actual deeds for each home in the development, and included disclosures in the covenants, conditions, and restrictions ("CCRs") of the neighborhood. In fact, Megatel only needed to go to Virginia Hills for an example, where the disclosure is included in the CCRs for the entire neighborhood.

Second, the proposed ordinance would only provide the Notice to the homes bordering the runway (see the Proposed Ordinance, Section 3.1.c.). The limited effect of the Notice falls well short of any reasonable, thoughtful, and well-intentioned measure designed to inform future Hidden Lakes residents and responsibly develop the subject property.

Third, the Notice recommends that "prospective resident[s] of the Hidden Lakes Subdivision" enter onto private property owned entirely by the ACPOA and its members. Megatel proposes that the City Council effectively recommend that any prospective resident "take the time to drive through Aero Country airport and observe the activities being conducted there." By improperly recommending that prospective residents enter onto the ACPOA's private property and in effect see for themselves, Megatel has again attempted to abrograte its responsibility to safely and responsibly develop the Subject Property. Instead Megatel seeks to place the onus on the prospective resident to become familiar with the ACPOA airport activities prior to purchase. Clearly the average purchaser will have no way of knowing whether such a residential use is compatible and will in all likelihood assume that Megatel and the City completed the appropriate due diligence prior the approval of the Development.

Collectively, the deficiencies in the manner in which Megatel have attempted to resolve the compatibility issues created by its Proposal and identified by the City Council demonstrate Megatel's utter lack of concern for and commitment to the prospective families and residents of the Hidden Lakes development.

CONCLUSION

That the City Council should maintain consistency with the McKinney Comprehensive Plan is elementary. Indeed, the City Council has already zoned the property correctly in accordance with TxDot Guidelines, FAA Guidelines and the City's Comprehensive Plan by enacting the zoning ordinance currently in place on the Megatel property. But equally important, the City Council is charged with the mission to protect "the larger public interest" and "to facilitate the creation of safe, balanced, efficient, visually appealing and economically sustainable developments within McKinney's ultimate planning area. (*See* City of McKinney website). It is clear that both the State and Federal authorities have concluded that residential development adjacent to public use airports is not a compatible use. Very simply, to approve the Megatel's rezoning request would be directly contrary to the TxDot and FAA guidelines and the City's Comprehensive Plan. The No Hazard Letters are the minimum areas to be protected and not determinative of compatible zoning. Since the last council meeting, Megatel has had over six months to obtain a noise study and collaborate with the ACPOA to find a suitable solution, but has failed to do so. Without a noise, safety or other study to show that the proposed residential development is compatible with airport operations the City Council cannot make an informed decision on the proposed rezoning and any approval decision would be unreasonable, arbitrary and capricious.

Megatel has recently filed a new agenda item for the May 5th Meeting which may have some additions and revisions to the prior submission. ACPOA reserves the right to address any new items which may not be addressed herein or in the ACPOA Opposition Letter submitted in connection with the November 18, 2014 meeting.

Very truly yours,

/s/ Kevin A. Ganci

Kevin A. Ganci

Enclosures

cc: Client (w/enclosure)
(Via Email)

Exhibit “A”

AIRPORT COMPATIBILITY GUIDELINES

Compatibility Planning
Compatible Land Use Zoning
Hazard Zoning
For
Airports in Texas

January 2003

Texas Department of Transportation
Aviation Division

Texas Department of Transportation

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INTRODUCTION

The Texas Department of Transportation (TxDOT) developed these guidelines as a reference source for elected officials, zoning board members, and city and county staff members responsible for assuring compatibility between an airport and the community it serves. While zoning may the first thing considered, there are other measures that a community may take to enhance compatibility.

Officials are urged to review Chapters 1 and 2 of these guidelines before deciding which measures are best suited for their airport and community.

These guidelines are an update and revision of the first edition of "Airport Compatibility Guidelines" published by the Texas Department of Transportation, Division of Aviation, in 1992. That original document was modeled after and borrowed heavily from similar documents developed by agencies of two other States: the Wisconsin Department of Transportation, Division of Aeronautics, and the Oregon Department of Transportation. The Texas Department of Transportation, Aviation Division, continues to acknowledge these two organizations for portions of the information used herein.

CHAPTER 1: PLANNING FOR TOMORROW'S AVIATION NEEDS

Texans are people on the move, and more and more frequently they travel by air. The statistics are impressive. Nine percent of air travelers in the United States board at a Texas airport. Thirty-eight different airline companies serve the state with 26 Texas cities receiving commercial airline service. Airports in Texas annually enplane over 62 million passengers.

To meet this demand, Texas has approximately 400 unrestricted public-use airports, with 300 included in the state airport system plan. Ten million operations (takeoffs and landings) are made annually at these public-use airports.

Maintaining these facilities is a challenge to the many local governments and private organizations that own and operate airports. As if the current challenge were not sufficient, the demand for air services and the use of these facilities are projected to grow steadily. The Texas Airport System Plan forecasts that by the year 2012, boardings at Texas airports will have increased to 102 million passengers. Total operations will more than double during the same period.

A Cloud on the Horizon

The Texas Department of Transportation (TxDOT) Aviation Division is committed to encouraging and assisting airport sponsors with the continued development of a statewide airport system that can provide for this anticipated growth. Providing new airport facilities is vitally important, but even more important is the need to insure that existing facilities can be developed to their maximum feasible utility.

Unfortunately, the encroachment of incompatible land uses or tall structures that are incompatible with airport operations threaten the continued usefulness of many airports. The result of incompatible land use may be community opposition to increased levels of traffic or even current traffic volumes. The results of incompatible tall structures may be the raising of approach minimums or the loss of instrument approaches altogether. The problem of airport land use conflicts will become apparent in many more locations as both urban populations and the need for airport facilities continue to grow.

These guidelines have been developed to explain what can be done to create an environment compatible with airport uses. They are written to give the reader an understanding of compatibility issues as well as instructions for implementing compatibility plans.

- Chapter 1, the remainder of describes how airport land use conflicts have developed, why solutions to the problem are the responsibility of the airport sponsor, and what in general can be done to prevent conflicts.
- Chapter 2 describes what is involved in planning for an airport-compatible environment.
- Chapter 3 outlines the preparation of compatible land use and hazard zoning regulations to insure airport compatible development.
- Chapter 4 explains the procedures for adopting airport zoning.

An Asset to the Community

Airports have become increasingly important to the economy of the area they serve. While this has long been true for major urban areas, many smaller communities are finding that an airport is their open door to economic development. This is due in large part to the way in which many companies now do business. Rather than locating all of their facilities in one city, a company may establish branch offices throughout the country and use corporate aircraft to shuttle between the various sites.

In this way, even relatively small communities with a good general aviation airport are candidates for companies seeking to take advantage of the community's resources. In evaluating the community, prospective businesses often look at an airport as they do the community's other transportation services, schools, and utilities. Therefore, any airport can be an important and valuable asset to a community.

Conflicts Produced by Growth

Growth in the demand for aviation services coincided with the rapid growth of many urban areas. Land use conflicts were often the result. New high-rise buildings and communication towers protruding into an airport's airspace appeared on drawing boards and planning documents. Figure 1-1 illustrates how population growth and the demand for new housing can bring residential development to the doorstep of a once more remote airport.

Simultaneously, airports needed to expand to accommodate larger aircraft and more flights. Residents of areas exposed to the frequent overflights, especially by larger jet aircraft, found airport operations to be incompatible with their urban and suburban standard of living.

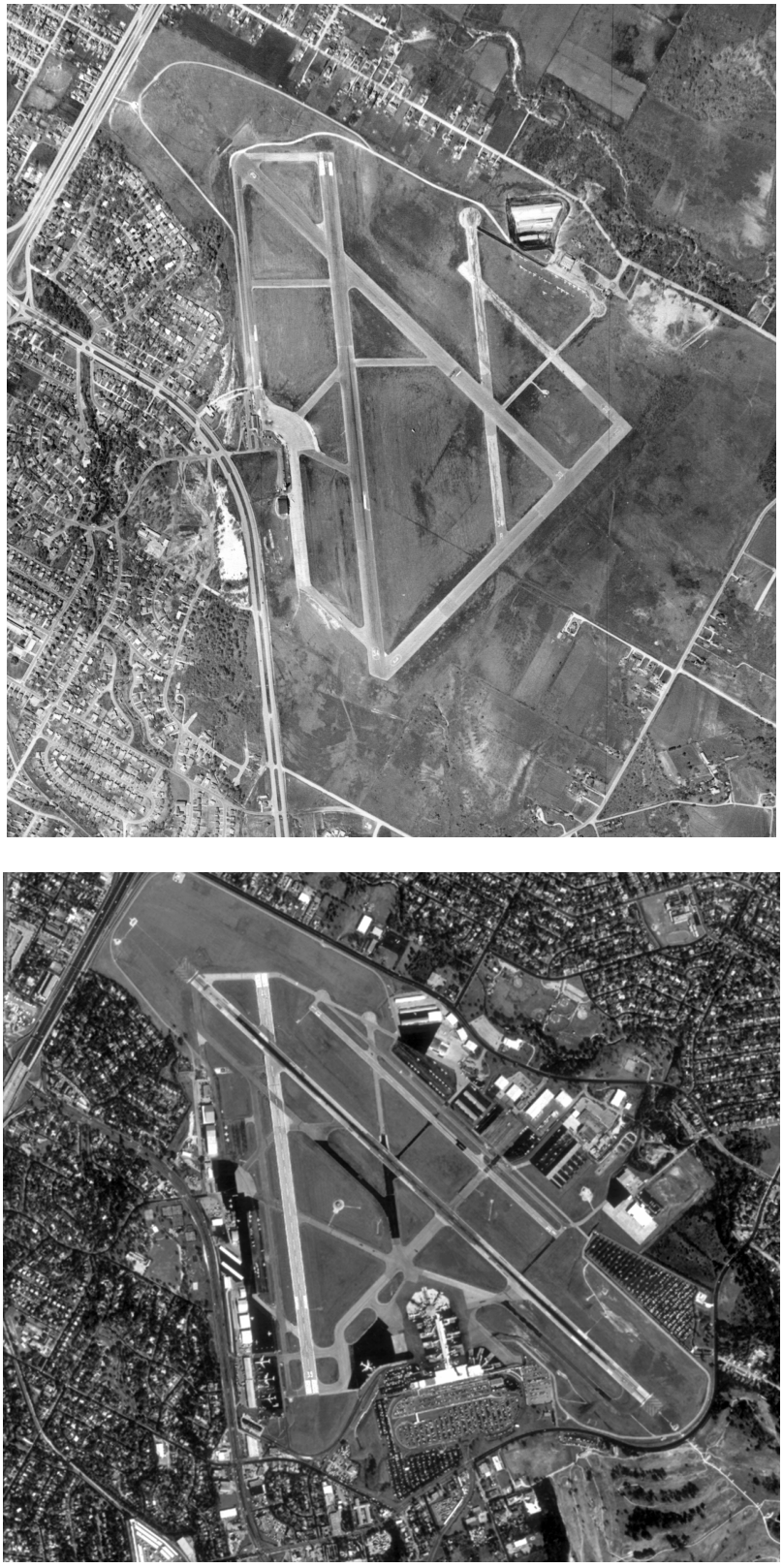
The initial response was to relocate the airport farther from the central city. However, with a few notable exceptions, the new airport sites were soon subject to encroachment by incompatible uses as development followed the airport. The process of relocation might have continued except that today there are few, if any, environmentally acceptable new sites for major airports. Acceptable sites are often located beyond reasonable access distances from the cities the airports are intended to serve. Even if suitable sites were readily available, many communities have found the multimillion-dollar cost investment required for a new airport to be prohibitive. Consequently, many major airports are affected today by incompatible development and must operate with certain restrictions to mitigate the impact of aircraft operations.

Though the more serious instances of airport land use conflicts are associated with larger air carrier airports, smaller facilities may have their own compatibility problems. The same increased use of business aircraft at general aviation airports that may offer economic opportunity may also introduce land use conflicts that previously were not apparent. Aircraft used by today's businesses do not generate so much noise as commercial transports, but in the quieter surroundings of smaller communities, their noise may be considered just as disruptive.

Prevention Preferable to Cure

Fortunately, many opportunities exist for Texas communities to forestall the development of incompatible uses around their airport. Suburbanization has not reached many airport sites serving general aviation. These guidelines will be most beneficial in these situations by recommending planning measures that can be implemented now to prevent what has happened at other locations.

Figure 1-1. Encroachment Around an Urban Airport



Without sufficient compatibility planning or enforceable zoning restrictions, the use of land surrounding this airport changed to a point that the airport was closed in 1999.

Hazard zoning should protect all airports, regardless of the airport's size. Apparently, our State Legislators also feel this is important because they have tied the requirement of hazard zoning to the State's airport grant program. In addition, any airport capable of serving jet transports, business jets, or large propeller aircraft, now or in the twenty-year planning period, should consider the compatible land use planning and zoning measures outlined herein.

Too frequently, airport sponsors have failed to plan for compatible development because land use conflicts are presently apparent. In certain cases, conflicts could have been prevented, but once conflicts develop, there is little that can be done to satisfactorily resolve them. The time to act is now, before incompatible land uses develop.

The Airport Sponsor's Responsibility

The responsibility for insuring the compatible development of the airport environment and preventing tall structures that negatively affect airports rests primarily on the airport sponsor for two reasons. The first and foremost reason is that decisions on how land is developed are made at the local level. State statutes give municipalities and counties the authority to regulate land development and tall structures near airports through planning and zoning. State agencies, such as the Texas Department of Transportation, can recommend appropriate controls to be used by local governments, but the responsibility and authority for implementing such controls lie squarely and solely with local governments.

The other reason compatibility planning is a local responsibility has to do with numerous legal decisions that have placed the liability for airport operations on the local airport sponsor. The noise produced by airport operations has been the basis of various lawsuits by nearby residents and the courts have generally held that the airport sponsor is the appropriate body to be sued. The U.S. Supreme Court, in Griggs v. Allegheny County, has ruled that when an airport sponsor had the ability to acquire property impacted by aircraft noise but failed to do so, the airport sponsor could be held liable for the diminution of property values.

The Airport Sponsor's Dilemma

Airport sponsors have responded to these rulings by attempting to limit the noise impact on surrounding areas by such measures as restricting the types of aircraft using the airport, noise standards for aircraft using the facility, and prohibitions (curfews) on nighttime use of the airport. In most cases, courts have found that these measures violate parts of the U.S. Constitution. The Federal Government's right and obligation to regulate the operation of aircraft in flight are frequently cited in striking down local attempts to limit noise. This means that the authority to regulate the flight of aircraft is under the jurisdiction of the Federal Government, not local governments. Courts have also found that bans on the use of airports by some types of aircraft, as well as some curfews, interfered with interstate commerce and were, therefore, illegal. Furthermore, the terms and conditions of various airport improvement grant contracts could prevent local governments from discriminating between different types of aircraft.

Airport sponsors find themselves in a judicial no-man's-land. On one side, courts have found them liable for the environmental impacts due to airport operation and, on the other side, have invalidated many of the actions airport sponsors have taken to limit those impacts. Avoiding confrontations between airport users and community residents is by far the most productive approach because once incompatible land uses develop, confrontation and legal challenges are

likely to follow with uncertain outcomes. Such confrontations can best be avoided by proper planning.

Resolving the Dilemma

The key to avoiding confrontation is, as previously suggested, advanced planning. Many of the existing conflicts are due to the absence of proper planning that considered the land use needs of an airport as part of a growing community. In some cases, airports may have been located outside of the jurisdictional limits of the community they serve. As the urban area population increased, extraterritorial airport sites came in contact with the urban growth which, without some sort of restrictions to protect the airport environment, could develop up to the boundary of the airport.

Recognizing the problem and the shortcomings of the standard community planning and zoning laws as they applied to airports, the Texas Legislature created and over the years enhanced the Texas Airport Zoning Act (AZA), Chapter 241 of the Texas Local Government Code. The AZA provides an effective tool for local governments to regulate the development of land and protect the airspace surrounding an airport.

A Cooperative Effort

As will be seen in the following chapter, the AZA is only one way to promote a compatible airport environment. Other ways, such as replacing the noisiest aircraft with quieter ones and voluntary actions on the part of aircraft pilots also can be beneficial.

A cooperative effort on the part of the airport sponsor, aircraft operators, the Federal Aviation Administration, and community residents is essential for compatibility planning to be successful. The effort admittedly may require compromise and some difficult decisions; however, the long term results should help insure an airport's continued service to the community.

CHAPTER 2: PLANNING THE AIRPORT ENVIRONMENT

This chapter describes what is involved in planning for an airport-compatible environment. Though you may be primarily interested in how to go about implementing airport compatible land use zoning or hazard zoning under the provisions of the Texas Airport Zoning Act (AZA), Chapter 241 of the Texas Local Government Code, **please read this chapter before turning to the chapters on zoning procedures. Zoning is only one of many actions that might be taken to develop airport compatible land uses.** It is important to understand when and where various actions would be appropriate.

Options to Consider

Each airport environment is unique, therefore, planning for compatible land use must be tailored specifically for each individual airport. Actions to achieve compatible development are not equally effective at all airports. Where the airport environment is already developed with many incompatible uses or structures, there are, quite frankly, few actions that can be taken to improve the situation significantly. On the other hand, where the land around an airport is largely undeveloped, there will be many opportunities for positive action.

The following explains how aircraft operations affect the land adjacent to an airport and the process for determining what land uses are compatible with these operations. The explanation is intended to give airport sponsors, airport operators, and adjacent landowners a basic understanding of airport compatible land use planning.

Airport Compatible Development

Airport compatible land uses are uses of adjacent properties that are not adversely affected by airport operations. Residential development is most sensitive to airport operations and is nearly always an incompatible land use if located close to an airport. Land uses where people congregate such as schools, churches, theaters, and hospitals also may be incompatible.

Some uses are incompatible because they actually represent a danger to aircraft using an airport. Examples of these include tall structures as well as commercial or industrial activities that generate bright lights, smoke, or electronic interference that may affect aircraft radios and navigation equipment. Landfills, which attract birds and other wildlife, can also be dangerous. The most serious hazards are tall structures that extend into the air around airports where aircraft are operating close to the ground.

There are many land uses that are considered to be compatible with an airport, as can be seen in Figure 2-1. These uses should be encouraged. It is important to understand that airport compatible development does not mean that land cannot be put to profitable use. Compatibility requirements may dictate that some parcels be developed less profitably, while other land that may have little development value may increase in value due to its proximity to an airport.

Figure 2-1: Examples of Compatible Land Uses

Airport Compatible Activities		Open Areas
Aerial survey companies	Convention centers *	Arboretum
Air cargo facilities	Gas stations	Botanical gardens
Air freight terminals	Hotels and motels *	Cemeteries
Aircraft manufacturing	Night clubs *	Farming and ranching
Aircraft repair facilities	Office buildings *	Game preserve
Aviation research and testing	Restaurants *	Golf courses
Aviation schools	Selected recreational activities	Landscape nurseries
Auto parking lots	Shopping centers *	Picnic areas
Auto storage areas	Taxi and bus terminals	Riding academies
Banks *	Trucking terminals	Sewage treatment facilities
Car rental agencies	Warehouse distribution centers	Water treatment facilities

* May require acoustical treatment

ASSESSING LAND USE COMPATIBILITY

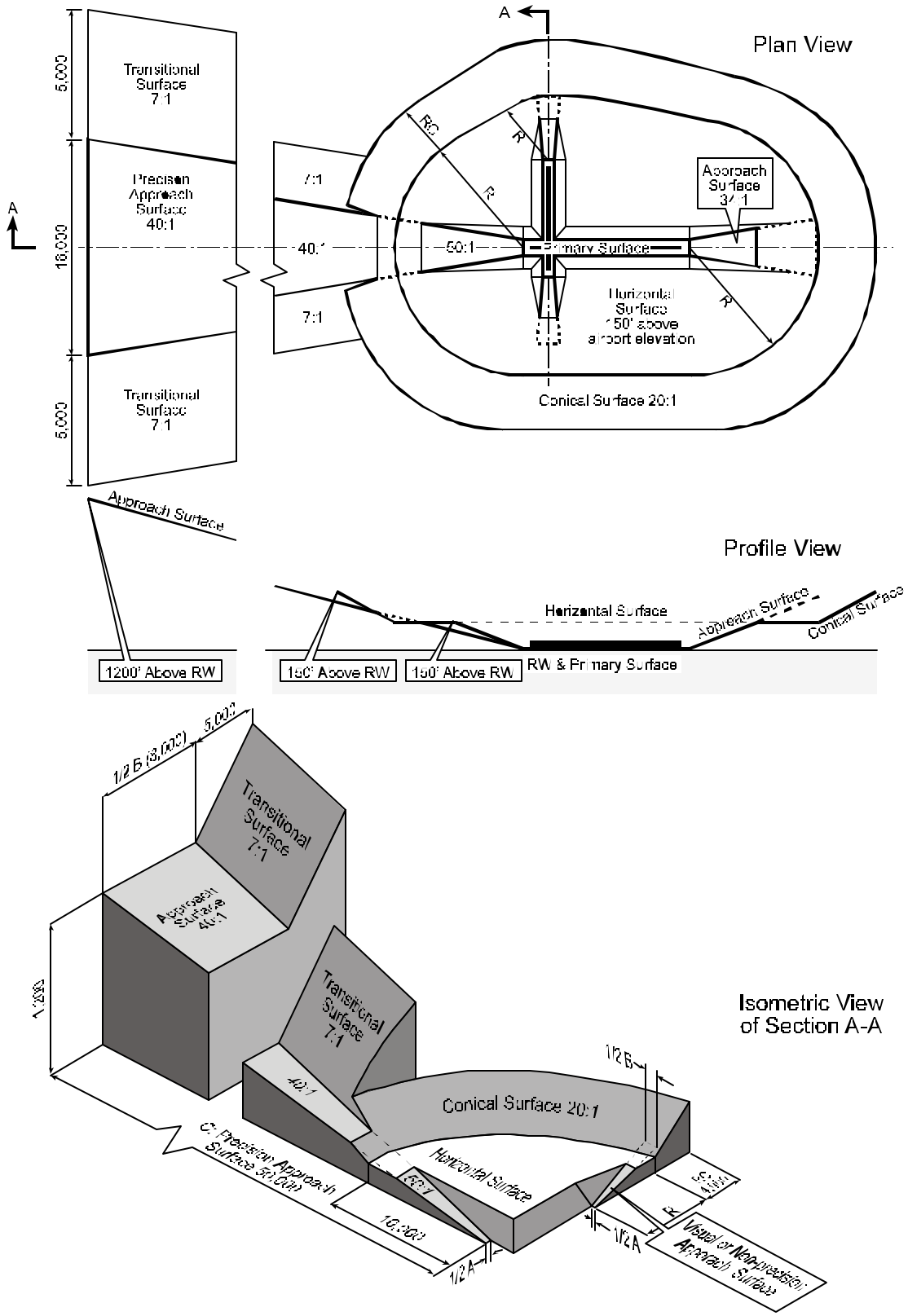
Two principal factors must be assessed to determine how a particular piece of land can be developed for airport compatible use: (1) the height limitations on structures and, (2) the level of airport noise to which the land is exposed. Both assessments require a technical analysis of the layout of the airport and the airport's operational characteristics. Chapters 3 and 4 discuss these assessments in some detail. However, a basic understanding of the factors is sufficient now.

Height Limitations

The majority of takeoffs and landings follow a path represented by the extended centerline of a runway. Approaching and departing aircraft normally enter or continue along this path from one to five miles from an airport. If aircraft always followed this path, limiting the heights of objects along that path would be the only solution necessary. However, variables such as the volume of air traffic, weather conditions, or instructions from an air traffic control tower often cause aircraft to deviate from this path. Aircraft may also circle an airport fairly close to the ground, particularly during bad weather, in preparation for landing at airports without an air traffic control tower.

The Federal Aviation Administration (FAA) has determined the maximum heights that structures in the vicinity of an airport may be before they are identified as obstructions to air navigation. These heights are contained in Federal Aviation Regulations (FAR) Part 77 and are discussed in more detail in Chapter 4. Figure 2-2 illustrates the basic concept.

Figure 2-2: Typical Imaginary Surface Height Limitations, FAA Part 77



Depiction shows an other-than-utility airport with instrument approach procedures to each runway end, and each procedure having one-mile minimum visibility minimums.

Structures obstructing any of the various Part 77 surfaces shown in Figure 2-2 may limit the airspace pilots normally expect to be clear. Those structures may also cause the published instrument approach procedures for an airport to be adjusted in order for a pilot to avoid those structures. Some states, including Texas, permit local governments to limit the height of structures around an airport by way of hazard zoning regulations.

Noise Exposure

Noise, by definition, is sound that is loud, unpleasant, unexpected, or undesired. The sound produced by aircraft becomes noise when it disturbs people. The best way to minimize the adverse impact of noise is to separate people from that noise.

Aircraft noise is greatest along the flight paths on which aircraft take off and land at airports. Ideally, these are the areas where noise-sensitive land uses should be excluded. Alternatively, restricting aircraft operations over these areas can also limit noise. To be able to predict the land area where aircraft operations may be a disturbance, we need to know: (1) the sound level at which a significant number of people can be expected to be disturbed, and (2) the areas exposed to that level of sound.

Precision instruments are used to measure and record sound levels. The instruments are often set to "hear" the way the human ear hears. Sound levels measured with an instrument calibrated for human hearing are expressed in units of A-weighted decibels (dBA), such as sound level of 60 dBA. The dBA scale is logarithmic which means that a sound level of 70 dBA will be perceived as twice as loud as a 60 dBA sound. Figure 2-3 identifies some common sounds and their relative loudness expressed in dBA.

Figure 2-3: Decibel (dBA) Levels of Common Sounds

Sound	Sound Level (dBA)*	Relative Loudness (Approx.)
Jet Plane, 100 feet	130	128
Rock Music, with amplifier	120	64
Thunder, danger of permanent hearing Loss	110	32
Power Mower; Boiler Shop	100	16
Orchestral Crescendo, 25 feet; Noisy Kitchen	90	8
Busy Street	80	4
Interior of Department Store	70	2
Ordinary Conversation, 3 feet	60	1
Quiet Automobile, at low speed	50	1/2
Average Office	40	1/4
City Residence	30	1/8
Quiet Country Residence	20	1/16
Rustle of Leaves	10	1/32
Threshold of Hearing	0	1/64

* U.S. Department of Housing and Urban Development Circular 1390.2

The sound created by the overflight of an aircraft can be measured in dBA at any point on the ground. Using known information about the type of airplane and its elevation, the sound level can also be calculated. Research has shown that while people may react to single noise event, the degree to which they are disturbed is related to the sound level exposure over a period of time. Therefore, a measure of dBA over time is needed.

The measure most frequently used to describe sound levels over a period of time is the "day-night average sound level" or DNL. DNL represents the average noise received at a given location during the time measured or the yearly average of dBAs integrated over 24 hour periods. For

flights occurring between 10 pm and 7 am, a 10 dBA penalty is added to the actual dBA value for each event because of the increased annoyance from overflights during the quieter periods when most people sleep. Noise exposure measured in DNL has been correlated with community disturbance in many studies. Plotting on a map the locations around the airport where DNL levels are high enough to cause annoyance can identify areas where residential development would be incompatible.

Mapping Noise Exposure

The measurement of noise events in the vicinity of an airport for a year would be time consuming and expensive. The FAA has developed a computer program to simulate the results of actual measurements. It is called the Integrated Noise Model (INM). Detailed field calibration studies have proven this program to be remarkably accurate. The program is maintained by the FAA and updated as frequently as necessary in order to reflect aircraft characteristics as the fleet evolves.

The INM computer program calculates the DNL levels associated with the type, frequency, and flight tracks of aircraft using an airport. Points having the same DNL can be connected to establish sound level exposure contours. These contours can then be used for land use compatibility planning, as illustrated in Figure 3-2. The program can also be used to estimate noise exposure for future airport conditions. For example, the expected changes in operations due to a new runway can be input into the computer program, which will produce contours for the new airport configuration. The contour map may then be used to plan for land uses that are compatible with the proposed airport improvement. Similarly, noise contours can be generated for alternative runway improvements to analyze which options would minimize the effect of aircraft operations on surrounding areas.

Determining Land Use Compatibility

There has been extensive research on community attitudes toward noise. Most of this research has been based on the number of complaints made by groups of residents exposed to similar noise levels. Other factors such as the audibility of normal speech, levels of annoyance, and general community attitudes have been included in the research.

Figure 2-4 summarizes the results of the research on the effects of noise on people in an urban residential environment. From this table, it becomes apparent that residents exposed to DNL levels in excess of 65 dBA will experience interference with normal levels of speech, complain more frequently, and consider noise to be a significant adverse aspect of the community environment. The effects of noise summarized in this table form the basis for the recommendation found in Federal guidelines that residential uses should be restricted within the 65 DNL contour.

Figure 2-4: Effects of Noise on People in an Urban Residential Environment

	Effects ➢					
Day-Night Average Sound Level (dBA) ➘	Hearing Loss[1]	Indoor Speech Interference[2]	Outdoor Speech Interference[3]	Annoyance[4]	Average Community Reaction	General Community Attitude Towards Area
75 & above	May Begin to Occur	98%	0.5	37%	Very Severe	Noise is likely to be the most important of all adverse aspects of the community environment.
70	Will Not Likely Occur	99%	0.9	25%	Severe	Noise is one of the most important adverse aspects of the community environment.
65	Will Not Occur	100%	1.5	15%	Significant	Noise is one of the important aspects of the community environment.
60	Will Not Occur	100%	2.0	9%	Moderate to Slight	Noise may be considered an adverse aspect of the community environment.
55 & less	Will Not Occur	100%	3.5	4%	Moderate to Slight	Noise considered no more important than various other environmental factors

1. Qualitative Description
2. % Sentence Intelligibility
3. Distance in Meters for 95% Sentence Intelligibility
4. % of Population Highly Annoyed

Figure 2-5 lists land uses and the DNL levels at which those uses are compatible. The table has been reproduced from FAA Advisory Circular 150/5020-1 and constitutes FAA's recommended land uses normally compatible with various sound levels. This is an expanded version of the compatible land uses identified in Federal Aviation Regulations (FAR) Part 150. Below the 65 DNL level, all land uses are normally compatible. Above 65 DNL level, residences and places of public assembly are not compatible unless sound level reduction paraphernalia are installed. Most sound level reduction paraphernalia, whether installed during original construction or after the fact, are only effective in reducing noise exposure if windows are closed at all times. Because residents often open windows during mild weather, it is questionable whether residential buildings are compatible in areas above the 65 DNL exposure levels. Where possible, residential use should be prevented within the 65 DNL contour and **under no circumstances should residential uses other than sound-insulated transient lodging be permitted within the 75 DNL contour.**

Figure 2-5: Land Uses Normally Compatible with Various Noise Levels

Land Uses	Yearly Day-Night Average Sound Level (dBA)					
	<65	65-70	70-75	75-80	80-85	>85
Residential						
Residential, other than mobile homes and transient lodgings [1]	Y	N [2]	N [2]	N	N	N
Mobile home parks (14)	Y	N	N	N	N	N
Transient lodgings	Y	N [2]	N [2]	N [2]	N	N
Public Use						
Schools, education services (68); hospitals, and nursing homes (65.13, 65.16)	Y	25	30	N	N	N
Churches, auditoriums, and concert halls (71, 72.1)	Y	25	30	N	N	N
Governmental Services	Y	Y	25	30	N	N
Transportation [3]	Y	Y	Y [4]	Y [5]	Y [6]	Y [6]
Parking	Y	Y	Y [4]	Y [5]	Y [6]	N
Commercial Use						
Offices, business, and professional [7]	Y	Y	25	30	N	N
Wholesale and retail – building materials, hardware and farm equipment [8]	Y	Y	Y [4]	Y [5]	Y [6]	N
Retail trade – general [9]	Y	Y	25	30	N	N
Utilities (48)	Y	Y	Y [4]	Y [5]	Y [6]	N
Communication (47)	Y	Y	25	30	N	N
Manufacturing and Production						
Manufacturing, general [10]	Y	Y	Y [4]	Y [5]	Y [6]	N
Photographic and optical – professional instruments, optical goods, watches (35)	Y	Y	25	30	N	N
Agriculture (except livestock) (84), Agricultural activities (82), Forestry activities (83)	Y	Y [12]	Y [13]	Y [14]	Y [14]	Y [14]
Livestock farming and breeding (81.5 to 81.7)	Y	Y [12]	Y [13]	N	N	N
Mining and fishing, resource production and extraction (84, 85, and 89)	Y	Y	Y	Y	Y	Y
Recreational						
Outdoor sports arenas and spectator sports (72.2)	Y	Y [11]	Y [11]	N	N	N
Outdoor music shells, amphitheaters (72.11	Y	N	N	N	N	N
Nature exhibits and zoos (71.2)	Y	Y	N	N	N	N
Amusement parks, resorts, and camps (73, 76, 72, 75, 70)	Y	Y	Y	N	N	N
Golf courses, riding stables and water recreation (74)	Y	Y	25	30	N	N

Key to Table

Number in ()	Standard Land Use Coding Manual (SLUCM)
Y (yes)	Land use and related structures compatible without restrictions
N (no)	Land use and related structures are not compatible and should be prohibited
25, 30, or 35	Land use and related structures generally compatible; measures to achieve Noise Level Reduction (NLR), outdoor to indoor, of 25, 30, or 35 must be incorporated into design and construction of structure.

Notes for Table

1. Includes: Household units (11), Single units – detached (11.11), Single units – semidetached (11.12), Single units – attached row (11.13), Two units – side-by-side (11.21), Two units – one above the other (11.22), Apartments – walk up (11.31), Apartments – elevator (11.32), Group quarters (12), Residential hotels (13), and Other residential (19)

2. Where the community determines that residential uses must be allowed, measures to achieve outdoor to indoor Noise Level Reduction (NLR) of at least 25 dB and 30 dB should be incorporated into building codes and be considered in individual approvals. Normal construction can be expected to provide a NLR or 20 dB, thus, the reduction requirements are often stated

as 5, 10, or 15 dB over standard construction and normally assume mechanical ventilation and closed windows year round. However, the use of NLR criteria will not eliminate outdoor noise problems.

3. Includes Railroad, rapid rail transit and steel railway transportation (41), Motor vehicle transportation (42), Air craft transportation (44), Marine craft transport (44), and Highway and street right-of-way (45).
4. Compatible where measures to achieve NLR of 25 are incorporated into the design and construction of portions of these buildings where the public is received, office areas, noise sensitive areas or where the normal noise level is low.
5. Compatible where measures to achieve NLR of 30 are incorporated into the design and construction of portions of these buildings where the public is received, office areas noise sensitive areas or where the normal noise level is low.
6. Compatible where measures to achieve NLR of 35 are incorporated into the design and construction of portions of these buildings where the public is received, office areas, noise sensitive areas or where the normal noise level is low.
7. Includes Finance, insurance and real estate services (61), Personal services (62), Business services (63), Professional services (65), Other medical facilities (65.1), and Miscellaneous services (69).
8. Includes Wholesale trade (51), Retail trade – building materials, hardware and farm equipment (52), Repair services (64), and Contract construction services (66).
9. Includes Retail trade – general merchandise (53), Retail trade – food (54), Retail trade – automotive, marine craft, aircraft, and accessories (55), Retail trade – apparel and accessories (56), Retail trade – furniture, home furnishings and equipment (57), Retail trade – eating and drinking establishments (58), and Other retail trade (59).
10. Includes Food and kindred products – manufacturing (21), Textile mill products – manufacturing (22), Apparel and other finished products made from fabrics, leather, and similar materials – manufacturing (23), Lumber and wood products (except furniture) – manufacturing (24), Furniture and fixtures – manufacturing (25), Paper and allied products – manufacturing (26), Printing, publishing, and allied industries (27), Chemicals and allied products – manufacturing (28), Petroleum refining and related industries (29), Rubber and misc. plastic products – manufacturing (31), Stone, clay and glass products – manufacturing (32), Primary metal industries (33), Fabricated metal products – manufacturing (34), and Miscellaneous manufacturing (39).
11. Land use compatible provided special sound reinforcement systems are installed.
12. Prime use only, any residential buildings require an NLR of 25 to be compatible.
13. Prime use only, any residential buildings require an NLR of 30 to be compatible.
14. Prime use only, NLR for residential buildings not normally feasible, and such uses should be prohibited.

Source: U.S. Department of Transportation, Federal Aviation Administration, AC 150/5020-1, "Noise Control and Compatibility Planning for Airports", August 5, 1983.

PLANNING FOR AIRPORT COMPATIBILITY

Information on height limitation and noise exposure can be put to use in a comprehensive review of land uses in the airport environs. This is especially true if a community that owns an airport, or in which an airport is located, is contemplating compatible land use zoning regulations based on noise data. It is important that all reasonable means of achieving land use compatibility be examined including those that provide restrictions on the use of the airport. Airport officials should participate in the planning process along with community leaders and local officials to ensure the airport's interests are made known. Comprehensive community plans in the past have not always considered the relationship of an airport to neighboring land uses. It is vital that community planners incorporate the information developed in airport master plans and airport land use compatibility studies into comprehensive land use plan updates.

Airport Master Plans

The basic information needed for airport/land use compatibility planning can be provided through an airport master plan. A master plan includes a wealth of data on past and current airport operations as well as the socioeconomic characteristics of the region served by the airport. This data is used to forecast the level of activity at the airport for 5, 10, even 20 years in the future.

Airport improvements are then planned to meet the demand forecast for the airport and programmed as funds become available.

Airport master plan studies also include an analysis of the noise impact with noise contour maps, see Figure 3-2, showing the effects of different planning and development scenarios for the 5 and 20 year forecast periods. These contours are overlaid on a map of the community showing existing land uses. Existing as well as potential land use conflicts can be identified and various ways in which the airport operator, the airport sponsor, and community leaders may eliminate incompatible uses or prevent future incompatible uses from developing can be explored.

A master plan should also contain detailed plan and profile views of the approach surfaces as well as a plan view drawing of the complete FAR Part 77 imaginary surfaces pertinent to the airport similar to Figure 2-2. These drawings can be used to develop height restriction zoning regulations.

If the master plan contains well-prepared land use scenarios, the community has the primary information needed to initiate airport land use compatibility planning. The airport operator may use this information to plan actions that limit the noise made by the aircraft using the airport. These aviation controls can then be combined with the land use controls to produce a compatibility plan. A warning should be added here that for compatibility planning, the airport master plan must be current. If area population and aircraft operation forecasts appear to be out of date, the airport master plan data should not be used in the compatibility plan. Airport master plans more than five years old should be reviewed carefully.

Part 150 Compatibility Studies

The FAA has published guidelines for noise control and compatibility planning for airports. These planning studies are called "Part 150" studies in reference to Federal Aviation Regulations (FAR) Part 150 that authorizes them. Part 150 studies follow the same procedures for analyzing airport impacts as previously described master plan studies. However, where the emphasis of master planning is on the airport improvement program, the sole purpose of the Part 150 study is airport/land use compatibility. Therefore, the Part 150 study will be far more detailed in its analysis of noise abatement and compatibility planning measures.

Part 150 studies ideally are undertaken concurrently with, or shortly after, the completion of an airport master plan. This assures that the base data for forecasts is current and that improvement alternatives are evaluated with respect to their impact on the community. At airports where master plans are outdated, a modified master plan update should be undertaken prior to a Part 150 study. Acceptance by the FAA of the noise compatibility program qualifies the airport sponsor for consideration of Federal funding for noise abatement measures identified in the compatibility program. Abatement measures that could be funded include acoustical construction and land acquisition.

It is highly recommended that airport sponsors considering use of the AZA's compatible land use zoning provisions pursue a Part 150 or similar study of noise abatement and compatibility planning measures. Federal funding is available to cover 90 percent of the cost of Part 150 studies for most airports. Information on Part 150 studies is available from the FAA or TxDOT.

DOD Compatibility Analysis

The Department of Defense has developed a compatibility analysis similar to the Part 150 study for military airports. It is referred to as an **Air Installation Compatible Use Zone Program** (AICUZ). The AICUZ study will contain noise maps similar to those contained in a master plan or

Part 150 study. The AZA permits cities and counties to zone around military installations and AICUZ noise exposure maps can be used for this purpose, if they are current. Communities should consider the AICUZ analysis during the development of community comprehensive land use plans where applicable. However, the primary responsibility for noise abatement at a military installation remains with the military. AICUZ plans also identify Accident Potential Zones (APZ) which extend along the runway centerline beginning 3000 feet from the end of the runway and extending out as far as 15,000 feet. Communities should consider APZs when planning land uses in the vicinity of military installations.

IMPLEMENTING PLANS FOR AIRPORT/LAND USE COMPATIBILITY

Once land uses compatible with airport operations have been identified, success in implementing a compatible land use plan will depend on the cooperation and support of all affected parties. This cooperation may best be achieved by including representatives of the affected parties in all phases of the plan's development. The affected parties would include political subdivision officials, airport operator, airport users (especially air carriers), and neighboring landowners and residents. All parties should reach general agreement that the compatibility plan is fair and represents the best that can be accomplished under the circumstances. It will not represent 100% of each participant's desires or needs, but will be a compromise of all parties.

There are limits to what can be achieved. For example, the airport operator cannot require pilots to make noise reducing maneuvers that might be considered unsafe or demand specific flight procedures in order to minimize noise impact. Courts have held that only the FAA can dictate what procedures aircraft must follow once airborne. An airport operator and the airport users may voluntarily agree on preferred operating procedures, but mandatory procedures require FAA actions.

The amount of control municipalities have over the land in the areas affected by the airport is similarly limited by state statutes. Political subdivisions may be authorized to enact zoning regulations, building codes, and condemnation, but these measures are subject to constitutional and judicial limitations on the public taking of private property and other requirements of due process.

Still, most of the actions that might be taken by political subdivisions fall under their police powers, which allow them significant authority to provide for the public health, safety, and general welfare. The validity of a political subdivision's police powers is strengthened when the State legislature specifically invokes the use of such power for a defined purpose. Such is the case of the AZA where the use of zoning has been specifically authorized by the legislature for compatible land use regulation and height limitation.

Land use compatibility planning procedures fall into two overall categories: measures to reduce noise exposure and actions to forestall incompatible development. Measures to reduce noise exposure may be undertaken by the aviation sector, i.e., the airport operator and the airport users. Actions to forestall the development of incompatible uses may be implemented by the political subdivisions representing the affected areas. The following sections briefly describe the measures to be considered in preparing compatibility plans.

Measures to Reduce Noise Exposure

Noise abatement measures that the airport operator and pilots may undertake include facility changes, changes in operational procedures, restrictions on operations, or other measures.

Facility Changes

Changes in the design of the airport facilities, most importantly runways, are one method of reducing off-airport noise impacts. Such changes are very expensive alternatives and may take several years to implement. There are many airports where design changes are not a practical remedy due to physical limitations on new construction. Where takeoffs and landings on a particular runway result in DNL levels incompatible with existing off-airport development, consideration can be given for the construction of a new runway from which overflights will avoid such development. However, since runways are oriented based on the prevailing wind direction, a new runway will likely require an orientation similar to the existing runway. If a new or replacement runway is to be constructed for the purpose of avoiding noise sensitive areas, the new runway would require significant lateral separation. This will limit where the new runway could be located because, without sufficient separation, the flight paths will likely continue to go over the same general areas or neighborhoods.

An alternative to the construction of a new runway for noise abatement is the redesign of a secondary runway to serve as the primary runway. This may involve lengthening and strengthening runway pavement and improving the landing aids. This alternative is viable only if the orientation of the secondary runway will permit its use a majority of the time based on the prevailing wind direction.

If new runway construction is not possible, the threshold of the existing runway can be moved to a point farther down the runway. That portion of the runway beyond the new threshold would then be removed or used as a clearway or stopway. By moving the threshold away from noise sensitive areas, aircraft will normally be at a higher altitude as they pass over those areas on both takeoff and landing. Thresholds can be moved only if the shortened runway remains long enough to support the aircraft using the airport. Runway length can be maintained if the runway is extended on the opposite end to compensate for the new threshold. Moving thresholds may not achieve significant levels of noise reduction but are generally less expensive to implement than the construction of a new runway.

Noise barriers in the form of earthen berms or concrete structures may reduce noise levels on nearby land at those locations on the airport where engine run-ups (engine tests before takeoff) occur. However, because such barriers cannot be located in the landing or takeoff areas, such barriers would have little or no effect on noise generated during takeoff or landing.

Changes in Operational Procedures

Changes in the way aircraft use an airport can also contribute to noise reductions over sensitive areas. For example, instead of the standard left turn upon final approach, special procedures can be enacted so that a pilot begins final landing procedures on the opposite side of the runway making a right turn to align with the runway. Nonstandard flight procedures can be suggested by the airport operator or airport sponsor but require approval of the FAA. Consultation with airport users is vital when considering implementation of nonstandard flight procedures for the purpose of noise abatement.

Large aircraft are generally less sensitive to wind direction than smaller airplanes. Under calm and low wind speed conditions, large aircraft can normally use any of the available runway ends. Airports can adopt preferential runway use plans in which specific aircraft are directed to use a certain runway or runway end during calm wind conditions. Such use could minimize noise impacts in sensitive areas off one end of the runway.

The paths that aircraft follow as they approach and depart an airport may also be modified somewhat to avoid noise sensitive areas. Especially on takeoff, when aircraft are loudest,

procedures can be developed for the aircraft to maneuver away from developed areas once clear of the airport. Large aircraft have less flexibility on landing because they descend on an extended glide slope. Minor modifications to the glide slope may be possible but will likely not increase the height of descending aircraft enough to provide significant noise reduction. Any deviations from the standard approach or departure procedures require FAA approval.

Engines are the primary source of airplane noise. Maximum noise is generated on takeoff. The rate at which airplanes climb can be adjusted somewhat to reduce noise. Airlines are usually receptive to adopting these procedures where necessary and several standard procedures for this purpose have been developed.

Airport operators may establish restrictions on engine run-ups without FAA approval. These restrictions could indicate where run-ups take place on the airport. Run-ups on engines being overhauled in maintenance facilities could be restricted to acoustically isolated structures and/or during daytime hours.

Restrictions on Operations

Restricting use of the airport for noise abatement purposes generally should be a last-resort measure. Shutting the door to the airport during certain times of the day (curfews) could inadvertently limit economic growth and development and will likely be contrary to the airport sponsor's State and Federal airport improvement grant obligations. There may be instances, however, when restrictions are necessary due to excessive noise levels and few alternatives for abatement procedures or compatible land use programs. For example, communities with more than one airport might establish a curfew for one facility without denying air access to the community as a whole. However, in cases challenged, courts have usually sided with airport users. Airport sponsors considering any type of curfew should consult closely with the airport users and the FAA.

Use restrictions can be used for noise abatement by limiting the noise level or the frequency of noise events. As stated above, DNL levels are partially a function of the number of operations. Therefore, it is possible to contain the area of noise exposure by establishing a limit on the number of operations. Use of the airport also can be limited to those aircraft meeting FAA noise standards, although most aircraft now meet these standards. A limit could also be considered on the maximum noise level generated by a single aircraft operation. Landing fees based on noise levels (noisier aircraft pay a higher fee) can be implemented. Landing fees are a small part of airline operating costs and an increase for noise exposure would not likely change aircraft operating procedures. Likewise, fees generated would likely not be sufficient to aid in noise abatement actions.

Other Measures

Relocating and closing an airport are other alternatives. These should only be considered in extreme cases where use and development of the airport are absolutely limited by uncorrectable, incompatible development. Relocating an airport is a very radical and expensive alternative and usually beyond a community's financial resources. Closing an airport altogether is likewise a radical maneuver and it too could actually become quite expensive for a community. Airport improvement grants from the FAA or the State as well as the deed of transfer for an airport given to community under the U.S. Government's surplus property program all contain terms and conditions requiring the airport sponsor to keep the airport open. If those terms and conditions are not met, the grant monies may need to be refunded or, under the surplus property agreement, the complete airport property may revert in ownership to the government.

Actions to Forestall Incompatible Development

Political subdivisions (a city or a county government) owning the airport or served by the airport must implement all of the measures to insure land use compatibility off the airport property because municipal zoning powers and eminent domain authority lie solely with political subdivisions. Therefore, it is important for the airport staff and planners to work closely with the planning, zoning, and code enforcement officials of the communities involved.

There are a wide variety of actions that can be taken to insure development around an airport is compatible with airport use. They include the acquisition of property, implementation of restrictive covenants, review of land development plats, condemnation procedures, subdivision regulations, establishment of building codes, consideration of capital improvements, and adoption of zoning regulations. Airport land use compatibility plans may recommend various combinations of these techniques. Again, it is important to emphasize that these measures are far more effective in preventing the development of incompatible uses than removing or mitigating existing uses. Once incompatible uses are in place, options for achieving compatibility are greatly reduced.

The following paragraphs describe the actions that may be considered in achieving land use compatibility. In all cases they should be taken judiciously and with careful planning. Though the legislature has given municipalities flexibility in their use of the police power to achieve orderly development of the community, there are limits to the measures that can be taken and how they are undertaken. It is highly recommended that your city or county attorney or other legal counsel be consulted when considering compatibility plans using the techniques described below.

Acquisition of Property

Property acquisition may include complete ownership of the land, the right to use the land or deny others from using the land for a certain purpose or length of time, and the right to cross through or over the property. Any one or all of these property interests might be acquired for compatibility planning purposes. Acquisition can be made through purchase, condemnation, or by grant. Public ownership of the property and all its rights is the best way to insure compatible development. Since few developed uses of land are compatible within the 75 DNL contour, it is recommended that property within in the 75 DNL contour be acquired.

Restrictive Covenants

Public ownership of land in the airport-affected area is the best way to insure compatible development; however, this technique can be expensive. A municipality may not have to retain actual ownership of property to achieve the compatibility desired. The property can be acquired then resold or leased with deed restrictions that prohibit incompatible use of the property.

Plat Review

Local regulations might require airport noise contour lines be drawn on any land use development plat map when it is reviewed. This would allow the reviewing authority to consider the proposed land uses of land near an airport and either disapprove the plat or require special acoustic paraphernalia before approval is issued. If approved, showing the airport noise contours on the plat would allow perspective buyers to determine whether their proposed development plans mesh with the noise exposure generated by the airport.

Condemnation

Eminent domain is the right of a governmental unit to acquire property needed for public use. One method of acquiring property for eminent domain is called condemnation. Condemnation may be used to acquire an easement as well as total rights to property.

Subdivision Regulations

The State legislature has given municipalities authority to regulate the manner in which land is subdivided and developed. Subdivision regulations may specify the way streets are laid out, how drainage should be handled, or they may require the developer to dedicate easements or land for public purposes. One such public easement could be the overflight of aircraft along with their associated noise. A subdivision ordinance also might restrict residential housing or require special acoustical construction within certain DNL contours.

The Cities of Irving and Grapevine have subdivision regulations that require the dedication of avigation easements. Both cities are next to the Dallas-Fort Worth International Airport and have some of their jurisdiction lying within the airport's 65 DNL contour. The avigation easement effectively protects the cities from lawsuits by people who move into the noise impacted areas.

Building Codes

Building codes are designed to insure the safe construction and reconstruction of buildings. Most cities adopt a standard building code. Codes adopted for local use can be modified to specify construction techniques to reduce internal noise levels. These techniques may be specified for structures within a 65 DNL contour. The application of a building code cannot be retroactive. Existing buildings would not be subject to the construction provisions of the code unless they were being substantially reconstructed.

Communities using building codes to insure compatible use near an airport should consider these drawbacks:

a) There is no accepted "standard" building code for achieving noise reduction. Acoustical expertise is needed to determine the level of noise reduction that can be achieved by certain building construction methods. Many factors affect the level of sound that can be transmitted through the exterior of a building.

b) Noise reduction achieved through building construction is effective only if windows are closed at all times. With the mild climate and attractiveness of outdoor activities during certain times of the year in Texas, using special construction to minimize interior sound levels is usually not a practical means for assuring airport noise compatibility.

Capital Improvements

The extension of public utilities such as water and sewer lines and streets into undeveloped areas normally proceeds the development of that property. If the land is within an area impacted by the airport, certain development may not be desirable from an airport compatible use perspective. This potential problem may be resolved by the installation of public utilities that support airport compatible development. For example, in an area within the 65 DNL contour, public utilities that only support airport compatible uses could be installed instead of utilities designed to support residential use. Airport officials should monitor capital improvement programs near the airport and notify officials of their concerns.

Zoning Regulations

Zoning gets its name from the practice of dividing a municipality into various zones with varying land uses permitted in each zone. Zoning schemes normally include residential, commercial, and industrial zones. In sophisticated zoning schemes these districts may be subdivided into far more specific districts. Within each zone, the regulation implementing the zoning scheme may specify such things as building size, lot size, the separation between buildings, and the number of residential units permitted per acre. The zoning may also identify some uses that are not normally permitted.

The authority to zone is based on police powers that permit communities to plan their development in a way that will promote public health, safety, and general welfare. The zoning scheme is one of the major means of implementing the municipality's comprehensive land use plan. Courts of law have held that zoning regulations that place reasonable restrictions on the use of property in order to implement a plan for orderly community development are lawful.

Zoning is a powerful tool in guiding compatible land use development. Since it restricts the way in which a property owner may use the land, zoning must be established with care.

Zoning became a common municipal practice several decades in the past and certain rules have developed to insure that the administration and enforcement of zoning is fair. Among the more important rules are the requirements that zoning be based on a reasonable plan for community development, permit the owner some economic use of his/her property, allow for the affected owner to participate in the zoning process, and allow property owners to have redress for unfavorable decisions. A caveat is that zoning (a use of the police power) cannot be a substitute for eminent domain (condemnation). This means that a municipality may not zone land that it wishes to acquire in such a manner that the property's value is deliberately diminished to the benefit of the community. This is called "inverse condemnation." When this issue has been raised in courts of law, the courts have generally supported the municipality if it was shown that the zoning in question was reasonably related to the community's police powers, even if some diminution of property value took place. The line between legitimate use of zoning and inverse condemnation is frequently very fine. Officials should be aware of this distinction when implementing airport compatible land use zoning regulations.

Zoning has other limitations that make it less than the ultimate technique to achieve airport compatible land use development. Zoning cannot be applied retroactively. When a new zoning regulation is enacted, existing nonconforming uses are "grandfathered." Therefore, zoning cannot create compatibility where incompatibility exists. Zoning regulations generally apply only to the jurisdiction that adopts the ordinance. Zoning regulations also can vary among municipalities in the way they are written. Some regulations are exclusive; meaning that in a commercial zone only commercial uses are permitted. Other regulations are cumulative; meaning a commercial zone permits commercial and "higher" uses. The general hierarchy of uses from high to low is residential, commercial, industrial, then agriculture. While commercial development is usually compatible with airport operations, one can see that commercial zoning would be ineffective if applied under a cumulative zoning ordinance that permitted residential uses in commercial zones. Cumulative zoning is generally out of date, but such regulations do exist.

Compatible Land Use and Hazard Zoning Under the Airport Zoning Act

The Texas Legislature has recognized the potential usefulness of zoning to protect airports from incompatible development that would tend to diminish the airport's usefulness. The Airport Zoning Act (AZA) enables municipalities to adopt airport compatible land use and hazard zoning regulations. Airport zoning is not based on the same authority as the comprehensive community zoning discussed above. Though both forms of zoning have much in common, airport zoning overcomes some of the limitations of comprehensive zoning as applied to airport compatible land use planning.

One of the principal differences between the two types of zoning is in airport zoning's use of overlay zones. An overlay zone may be superimposed on comprehensive zoning. The overlay method of zoning does not specify what land uses are permitted, only those that are not permitted. For example, the height limit specified in an overlay zone for hazard zoning would supersede height limits of comprehensive zoning for the same area unless the height restrictions in the

comprehensive zone were equal to or more restrictive than the limitations for the hazard zone. Similarly, a land use permitted by comprehensive zoning might be prohibited or restricted by a compatible land use zone. Where the overlay zone includes areas with no comprehensive zoning, the requirements of the overlay still apply and constitute the only land use restrictions. These overlay zones may be shown on zoning maps that are prepared for each airport in question and those maps may be attached to and become a part of the adopted compatible land use or hazard zoning regulations.

The AZA also differs from comprehensive zoning in that it can be extraterritorial and multi-jurisdictional. The AZA permits two or more political subdivisions in the vicinity of an airport to form a joint airport zoning board. Compatible land use or hazard zoning regulations adopted by a joint airport zoning board are then effective in each of the jurisdictions represented on the board. Cities of 45,000 or more population having an airport within their territorial limits may unilaterally adopt compatible land use or hazard zoning regulations, which are effective in all jurisdictions covered by the overlay zones.

The AZA does not identify specific standards that must be used in determining what constitutes incompatible land uses or airport hazards. However, it is generally accepted that contours based on varying levels of noise generated by an airport and the various imaginary surfaces established in the Federal Aviation Regulations (FAR) Part 77 are the preferred standards to be used in airport zoning. These different types of zoning are further covered in Chapters 3 and 4.

Planning - The Key to Compatible Uses

This chapter has provided an important overview of the conflicts that can develop between compatible and incompatible airport land uses and how those conflicts may be avoided by advanced planning through acquisition of property, property rights, and/or zoning. It was pointed out that acquisition of property and property rights are the best way to ensure compatible land uses near an airport, but in the real world, zoning may actually be the only practical choice.

The main drawback to zoning is that it can be amended as local officials find it necessary or politically expedient to do so or at the discretion of new officials after each election. Easements, deed restrictions, and covenants on the other hand cannot be changed quite so easily.

Once again, it important to understand that the prevention of potential conflicts is a far more productive approach to airport compatible land use than attempting to resolve existing conflicts.

The remainder of this document contains more detailed information on the procedures to be followed in the preparation, adoption, and administration of airport compatible land use and hazard zoning. Model zoning regulations are included in Appendixes B and C.