

# CHAPTER 2: THE SYSTEM TODAY



## *Introduction<sup>12</sup>*

Chapter 2 highlights the different components of Minnesota’s aviation system today. Beginning with a primer on the key players involved with compatible land use decision-making, and followed by a closer look at the state’s airport zoning regulations and procedures, this chapter examines how the current system is set up for addressing land use compatibility and safety issues.

## *Key Players and a Summary of their Roles and Responsibilities*

There are many levels of responsibility regarding airport operations and airport land use compatibility issues. While the federal government, through the Federal Aviation Administration, plays an important role, the primary responsibility for implementation and enforcement resides with the Mn/DOT Office of Aeronautics and local governments throughout the state. This section discusses the respective roles of the federal, state, and local governments regarding airport safety and land use, as well as the other key players in the process in Minnesota such as airport owners and managers, regional governments like the Metropolitan Council, and others.

## **THE FEDERAL GOVERNMENT AND THE ROLE OF THE FEDERAL AVIATION ADMINISTRATION**

While the federal government does not have a direct hand in zoning and regulating development around airports, it plays several important roles related to compatible land use including planning, technical assistance, and funding.

### CHAPTER 2 OVERVIEW

- Introduction
- Key Players and a Summary of Their Roles and Responsibilities
- Minnesota’s Current System – Land Use and Airport Safety
- Federal System – Compatible Land Uses and Airport Safety
- Successes and Challenges With Current Minnesota Approach Toward Airport Safety
- Recommended Best Practices

<sup>12</sup> If this chapter is read in full, we recognize its contents may overlap with other discussions presented in other chapters. We believe most users will read specific chapters of this manual as needed and, therefore, we feel it is better to include some discussions that may be repetitive. Where possible, however, we have eliminated duplicate text and included cross references.



At the federal level, the primary agency responsible for aviation-related land use compatibility is the Federal Aviation Administration (FAA). Other federal departments such as the U.S. Environmental Protection Agency have minor regulatory review of various aspects of airport development and, more importantly, off-airport land issues. These other federal departments are quite diverse and are not considered to have a substantial role in the daily issues of compatible airport land uses, but are discussed in Appendix 9 with regard to specific regulations.

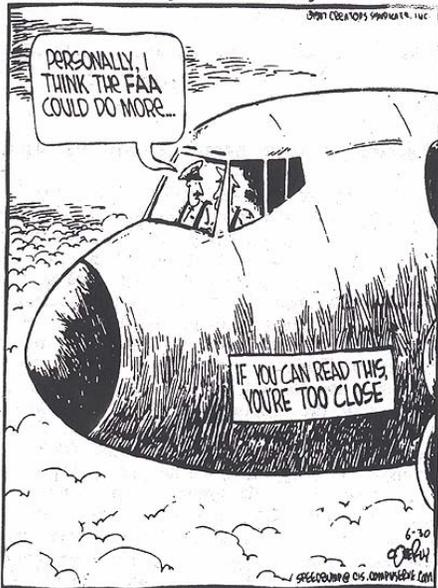
The FAA is responsible for federal laws and regulations affecting the aviation industry. It issues a variety of regulations and documents to this end, such as Federal Aviation Regulations (FARs), FAA Orders, and FAA Advisory Circulars (ACs). The FAA is also the funding mechanism for airport master plans, noise and land use studies, and other issues related to land use compatibility, as well as the funding mechanism for the construction, expansion, and safe operation of airports. As the governing aviation agency, the FAA is responsible for preservation of the national airspace and control of aircraft while in flight. This responsibility includes areas such as airworthiness and noise emissions of aircraft, as well as navigational aids and air traffic control facilities.

With regard to land use compatibility, the primary funding emphasis is on acquiring clear runway safety areas and approach areas in close proximity to the airport. The secondary funding emphasis is acquisition of easements to provide height controls over properties in close proximity to the airport. When warranted by a noise study, the FAA will typically participate in noise mitigation measures, which may include soundproofing structures, construction of noise barriers, or possibly acquisition to remove or relocate a noise-sensitive development.

Specific FAA regulations and their impact on land use issues provide the foundation for airport owners when developing a compatible land use strategy. These various regulations have historically focused on on-airport safety and land use. However, as land use issues continue to plague the nation's airports, the FAA has become more active in developing FAA Orders and Advisory Circulars to address more non-traditional land use compatibility issues such as wetlands, bird attractants, and cell towers.

Despite the FAA's important policy, oversight, and funding roles, local governments retain full control and jurisdiction over the use of land outside an airport's boundaries. The FAA's only leverage for promoting compatible land use planning off-airport is through the grant assurances that airport proprietors must sign in order to obtain federal funding for airport improvements. These grant assurances typically include promises or undertakings by the airport operator that surrounding local governments will impose adequate zoning and land use controls to protect the airport. However, after-the-fact monitoring or enforcement of such assurances by the FAA are rare. State and local agencies are free to set more stringent land use compatibility policies as they see fit.

Speed Bump by Dave Coverly





## THE STATE OF MINNESOTA

At the state level, the Minnesota Department of Transportation (Mn/DOT) is responsible for providing leadership in developing and operating a safe and efficient transportation system. Within the agency, the Office of Aeronautics has the responsibility of implementing the Mn/DOT mission as it relates to aviation and generally supervising aeronautics in Minnesota. The Office of Aeronautics is divided into five sections: Aviation Planning, Airport Development, NavAids, Aviation Education, and Aviation Operations. Of the five, the Aviation Planning Section has the most involvement with land use compatibility issues.

### ***Aviation Planning Section***

The Aviation Planning Section of the Mn/DOT Office of Aeronautics has responsibility to:

- Conduct and coordinate statewide and regional strategic, system, and master planning for aviation;
- Provide aviation involvement in intermodal planning activities;
- Maintain an aviation data base and make such information available to state agencies and the public;
- Assist the owners of publicly-owned airports in developing appropriate airport improvements;
- Develop forecasts of aviation activity and revenue needs;
- Assist and support Minnesota communities with scheduled air service matters;
- Assist airport owners in meeting federal and state environmental requirements;
- Monitor aviation issues and legislation; and
- Coordinate special programs and policy initiatives.

One of the most important activities of the Mn/DOT Aviation Planning Section is to advise local governments on land use compatibility issues and to monitor and enforce compliance with the state's minimum airport zoning standards and related procedures. In practice, many airport authorities seek the advice and guidance of section staff when confronted with potentially incompatible land uses. Staff from the section often makes presentations and gives advice to local planning commissions, zoning boards, and elected officials on a variety of land use issues such as variance requests.

As part of its education and information-sharing function, the Mn/DOT Aviation Planning Section directed the preparation of this Airport Land Use Compatibility Manual.



## LOCAL GOVERNMENTS

While the federal government and the State of Minnesota play important roles in assuring compatible land uses around airports, local governments are the first line of defense. Under state law, local governments are given the power to zone and directly regulate land uses like tall structures, residential developments, and landfills. The ultimate authority to say “yes” or “no” to a potentially incompatible land use in the airport environs rests with local jurisdictions. Accordingly, the relationship between local jurisdictions and airports is of critical importance, since airport sponsors rely upon local government staff to provide notice of land use actions proximate to airports, and establish the planning and zoning policies that enable the airport to operate effectively and safely.

Land use controls like zoning have proven to be one of the most effective tools to prevent incompatible land uses near an airport. Minnesota aviation law (Minnesota Statutes, Chapter 360) strongly supports local use of zoning powers, rather than condemnation, to control incompatible land uses. Zoning is most effective when enacted prior to development activity near an airport, which is typically early in the life of an airport.

Mn/DOT provides a model ordinance for local airport zoning regulations. The model ordinance provides a very good starting point for local regulatory drafting efforts. The statutes and rules allow a local government to provide more strict requirements than found in the state’s model. The statutes and rules also allow less restrictive zoning rules than contained in the model ordinance if a municipality can demonstrate to the Mn/DOT Commissioner of Transportation that: “the social and economic costs of restricting land uses in accordance with the standards outweighs the benefits of a strict application of the standards.”<sup>13</sup>

The State of Minnesota has adopted legislation creating several powerful tools to facilitate multi-jurisdictional airport zoning. These include joint zoning boards, preemptive extraterritorial zoning, and withholding of state funds for noncompliant communities.

The joint airport zoning board mechanism that is permitted under Minnesota airport zoning enabling legislation (Minnesota Statutes, Section 360.063, subd. 3) is perhaps the most effective tool for joint airport vicinity planning and adoption of consistent airport protection regulations. However, this approach has some significant shortcomings.

In addition to the joint multi-jurisdiction airport zoning board approach authorized by state law, the Minnesota statutes also authorize an airport-owning municipality and joint zoning board to apply airport zoning unilaterally to land within noncompliant municipalities, townships and counties. State law also gives municipalities extraterritorial zoning powers over adjacent un-zoned territory, which could be used to apply airport zoning to balking county or township areas. (See Minnesota Statutes, Section 462.357, subd. 1.) However, based on recent research, no

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<sup>13</sup> Minnesota Statutes, Section 360.065, Subd. 2.



jurisdiction has invoked any of these far-ranging powers to help implement airport zoning.

Another tool that can be used to encourage and require cooperative airport zoning rests with the Minnesota Department of Transportation, which may withhold airport funding if an airport jurisdiction fails to create a joint airport zoning authority or comply with the minimum airport zoning requirements. Of course, withholding state funds is an ineffective tool if a jurisdiction adjacent to an airport is the recalcitrant party—cutting off airport funding would have no effect and, in some instances, may be the desired result on the neighboring local government.

## AIRPORT SPONSORS

The owner/operator of an airport has the often-challenging role of working with independent local governments to protect its facility from incompatible land uses in the airport vicinity outside the airport proper. When the surrounding land is controlled by the same jurisdiction that operates the airport, theoretically this task should be less difficult—but that is not always the case when local economic development goals compete with the need for safe and efficient airport operation. The situation can be much more difficult if the adjacent local government has no direct stake in the airport.

Consequently, airport sponsors must be vigilant in their efforts to keep abreast of their local communities' actions regarding land use issues in proximity to the airport vicinity. Airport operators and sponsors must be closely involved with city and county officials in developing comprehensive plan policies, plan elements, and land use regulations that:

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

All federally funded airports have FAA assurances relating to land use compatibility that are part of their grant packages to build airport improvements, and such assurances must be adhered to. Sound airport land use compatibility planning/management is incumbent on all local governments, but it is a grant compliance requirement for those airport sponsors who are also the authority for planning, zoning and permitting activity in the airport vicinity. Consequently, airport owners must also be cognizant of the commitment these assurances carry with regard to land use compatibility. When receiving federal funds, a local community must be aware of the potential penalties for failing to fulfill the assurances. An example of these assurances is the preservation of a clear Runway Protection Zone (RPZ). The airport sponsor should acquire title to the



entire RPZ in fee whenever possible since it should not be off-airport; however, an easement should be acquired if outright purchase is not possible. Commitments from the assurances also typically include the preservation of compatible land uses and the protection of navigable airspace.

Airport sponsors should also stay in close contact with surrounding property owners so that those owners are not taken by surprise by airport improvement and expansion plans that may affect them. Often a little education will go a long way toward avoiding problems. For example, property owners are often simply unaware that certain types of uses (e.g., a landfill or lake that might attract wild fowl) may have serious adverse impacts on airport operations.

## **THE METROPOLITAN COUNCIL AND THE METROPOLITAN AIRPORTS COMMISSION**

The Minneapolis-St. Paul region has two major governmental entities that play a key role in airport land use compatibility in addition to local governments. They are the Metropolitan Council, a regional planning agency, and the Metropolitan Airports Commission, which manages Minneapolis-St. Paul International Airport and six reliever airports in the same region.

### ***The Metropolitan Council***

The Metropolitan Council (“Met Council”) is the regional planning agency that serves the Twin Cities seven-county metropolitan area and provides essential services to the region. The Metropolitan Council is responsible for regional transportation planning, including aviation, highway, and transit systems as well as transit operations. Since federal law requires the participation of local elected officials in transportation planning, the Transportation Advisory Board (which consists primarily of local elected officials), together with the Metropolitan Council, comprises the Metropolitan Planning Organization (MPO) for the Twin Cities area.

The Met Council must prepare a long range (20 year) transportation plan for the region every four years (the current plan was adopted December 15, 2004). It is also responsible for the selection of projects for federal funding and the preparation of a three-year transportation improvement program (TIP).

The most significant function of the Metropolitan Council relating to airport compatible land uses involves its regional land use planning process, which is defined under the Metropolitan Land Planning Act. All metro area communities prepared plan updates in 1998 and are required to again update their comprehensive plans by 2008. The Council reviews these local plans for conformance with the regional systems plans developed by the Council, including aviation, consistency with regional policies, and compatibility with adjacent and affected local governmental units.



## The Metropolitan Airports Commission

The Metropolitan Airports Commission (MAC) was created by state law in 1943. A public corporation, the commission was designed to provide for coordinated aviation services throughout the Twin Cities metropolitan area.

Today, the MAC operates the third largest aviation system in the nation, consisting of Minneapolis-St. Paul International (MSP) and six reliever airports. A 15-member board of commissioners appointed by Minnesota's governor and the mayors of Minneapolis and St. Paul sets and interprets the commission's policies. The Mn/DOT Commissioner is a nonvoting member of the MAC under Minnesota Statutes, Section 174.02, Subd. 5. Policies are implemented by the commission's executive director and staff.

The MAC's Planning and Environment Division is the section most involved in land use compatibility issues. This division supervises property acquisition, planning, design, engineering and architecture, and construction of all MAC facilities, as well as all commission-related environmental issues including noise, air quality and water quality. Relationships with other local, state and federal agencies are part of its overall responsibilities.

### AIRPORT USERS

Commercial airlines, air cargo carriers, and general aviation users are equally responsible for awareness of issues relating to land use compatibility, and for participating in local land use decision-making that may affect airport operations. While these players often focus their attention on noise issues because of community pressure and objections, it is equally important that they participate in both local land use planning and zoning efforts that establish permissible land uses around an airport and in specific land development decisions that may have an adverse impact on airport operations. They should take an active role by testifying at local land use hearings, and helping to establish the positive economic impact that their businesses have on the local economy.

Similarly, pilots, both commercial service and general aviation, are responsible for operating their aircraft in a prudent manner and should support local airport efforts to prevent the establishment of tall buildings and towers, excessive lighting, and other developments that might interfere with aircraft operations and navigation.



*Airport users should take an active part in local land use decision-making to ensure their needs are met.*

### PROPERTY OWNERS

Numerous studies document the positive economic impact an airport can have on a local economy and how it can create development opportunities related to air cargo, offices, hotels, restaurants, and similar uses.<sup>14</sup> On the other hand, a property owner may have plans to build residential or other

<sup>14</sup> Source: "A Better Way to Plan Airports" (Duerksen C., Reaves R., and Roddewig R.) *Urban Land*, March 1993; "Ready for Takeoff: Developing the 21<sup>st</sup> Century Airport" (Duerksen, C., Roddewig, R.) *Urban Land*, November, 1992.



development that is potentially incompatible with airport operations and will generate opposition for the airport operator and users.



*Nearby property owners also benefit from being involved in the airport land use planning and zoning decision-making process.*

Property owners who support the airport and stand to benefit from it should participate actively in local land use planning and zoning decision-making as outlined above for airport users. Additionally, if a nearby property owner is an advocate of aviation and has verbally committed to the local airport that he will cut trees on his property or promise to avoid any further development that may penetrate the required safety areas, steps should be taken to formalize these understandings. While this relationship is positive, the property owner must be educated about the need to procure at least an easement over his property to ensure the lifetime commitment to preserving the clear airspace after he no longer controls the property.

For those owners who might seek to undertake residential or other developments that are potentially incompatible with airport operations, they should work closely with local airport operators and stay abreast of airport improvement plans. With a little forethought, problems often can be side-stepped and developments planned in such a way that adverse impacts on the airport are avoided altogether. Property owners should also seek the advice and input of airport operators early in the planning process for new development so that developments can be configured to reduce or eliminate potential incompatibilities.

## GENERAL PUBLIC

The role of local citizens in the land use planning process is one of understanding and education. Involving the public in the planning process is essential so they understand the importance of maintaining compatible land uses near their local airport. Raising public awareness about the detrimental impacts of incompatible land uses is important to developing and understanding the commitment required to create a safe operating environment for not only the airport, but also the citizenry located in proximity to the airports. The most desired climate for implementation of compatible land use initiatives is one in which the local government has the support of citizens to implement the necessary policies and procedures. This support is usually gained through a deliberate process of educating and informing the public on safety and noise related issues.

Local citizens are also an important part of the land use planning process since they are often the individuals most affected by the land use techniques utilized to develop compatible land uses. For example, a local homeowner whose residence is located in an airport safety zone needs to be educated about the need for clear airspace within the safety zone. Educating and informing the local population about the necessity of compatible land uses around airports is essential to the preservation of the aviation system. These individuals influence the decisions of local planners, elected officials, and policy-makers who are directly responsible for the implementation of the various planning techniques required for implementation of compatible land uses.



## Minnesota's Current System – Land Use and Airport Safety

### BRIEF HISTORY OF AIRPORT ZONING IN MINNESOTA

The State of Minnesota has been among the national leaders in addressing the challenging issues involved with land use compatibility around public airports. Since 1943, airports in Minnesota have been authorized by state law to enact safety zoning. However, the first aviation regulatory statutes began in Minnesota as early as 1925. On January 1, 1946, the state enacted its first model airport zoning ordinance, and by 1958 it had designated Safety Zones A, B, C, and D as part of the model airport zoning standards. In 1973, local protective zoning was made a condition for receiving federal and state funding.

Since it was first established, the Minnesota model airport zoning ordinance has incorporated several changes to its restrictions on safety zones and uses. The model ordinance was last comprehensively amended in 1990. The state model currently provides an easy-to-use approach to airport protection through the device of three Safety Zones (A, B and C), with safety compatibility regulations specified for each zone.<sup>15</sup>

Local governments are also authorized to create joint multi-jurisdictional zoning boards to control land uses around airports with their neighbors, or to control land use in adjacent localities if cooperation is not forthcoming. Adoption of an ordinance must be certified by the state for airport funding.

Special airport planning requirements have also been established for the Minneapolis/St. Paul region where the large majority of aviation activity in the state takes place. When the Metropolitan Planning Act of 1976 became law, all communities in the seven-county metro area were required to prepare local comprehensive plans. Part of that planning process was for local airports and communities to recognize/implement the laws, rules, and regulations concerning airport safety zoning.

Despite these commendable steps, by 2004 it was becoming clear that there were gaps and shortcomings in the state's approach to protective airport zoning and prevention of incompatible land uses. Incompatible commercial and residential developments were being built close to growing airports, often hamstringing their operations.

### THE STATE MODEL ZONING ORDINANCE

The Minnesota state model airport zoning ordinance was first issued by Mn/DOT Office of Aeronautics in 1946 and last comprehensively

<sup>15</sup> In a previous version of the model ordinance, a fourth safety zone, "Safety Zone D," was included. In most cases, Safety Zone D is no longer included in local Minnesota airport zoning ordinances, although some airports have still carried forward Safety Zone D.

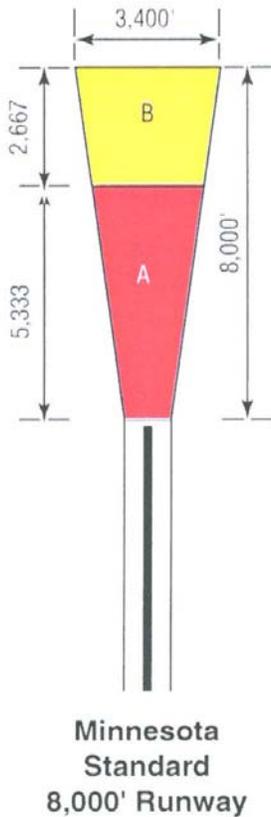
"Highway shoulders are the equivalent of aviation safety zones. It costs a significant amount of money to acquire an additional 20 feet of land to construct shoulders on our highway system. We know they prevent accidents and save lives, but it is difficult to statistically justify on a mile-by-mile basis. System-wide, we just know it is worth it. The same for safety zones applied throughout the state airport system – we know it's worth it, and so do the vast majority of our State airport owners."

*-Mike Louis, Director,  
Mn/DOT Aviation Planning  
Section*

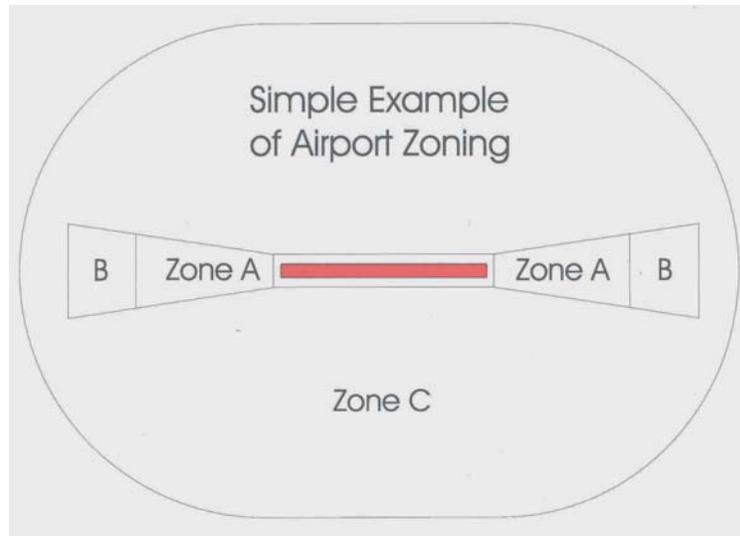


amended in 1990. The model ordinance provides a recommended structure for implementing height and land use regulations intended to minimize airport safety hazards and protect airport operations. These minimum regulations are outlined in Chapter 360 of the Minnesota Statutes, and further fleshed out in Minnesota Rule 8800.2400.

Airport safety zones recommended in the Minnesota state model airport zoning ordinance provide very useful guidance in drafting local protective zoning regulations and districts. The model airport zoning ordinance is very clear in setting the minimum dimensions of three airport land use safety zones: Zones A, B, and C. The three safety zones are intended to include all land under a runway's approach paths. Zones A and B extend a minimum distance, respectively, of two-thirds and one-third the planned length of the runway. See illustrations below and at left.



The model ordinance sets forth specific land use restrictions, height controls, and use prohibitions keyed to the three safety zones. While the ordinance's general regulations prohibiting the creation of new air navigation hazards and the ordinance's height restrictions apply in all zones, specific use restrictions currently apply only in Zones A and B, and not in Zone C. Thus, a local government desiring to provide protection for its airport and avoid incompatible uses can simply apply the dimensional requirements for delineating Zones A, B and C and adopt the relevant minimum height and use restrictions from the model ordinance as a starting point.





In a 2004 survey of Minnesota's 136 public airports, the state found that 130 airports have protective zoning in place where the text of the ordinance generally meets or exceeds the state model ordinance's minimum standards for safety zone dimensions, height limits, and use restrictions. See Appendix 3 for a summary table of the ordinance survey's key findings.

In fact, the state could identify only four ordinances in which the dimensions of the airport safety zones, as described in the ordinance's text, were less than the model ordinance's minimum specifications. For the four airport ordinances identified in the ordinance survey, Mn/DOT approved the safety zone reductions for different reasons.

Complementing this survey of airport zoning ordinance text, Mn/DOT Office of Aeronautics staff analyzed zoning maps for all 136 of the state's public airports. Staff found that for 84 of the 136 public airports (about 62%), local zoning authorities had adopted runway safety zone dimensions (Zones A, B, and C) that *exceeded* the model ordinance's minimum dimensional requirements, while another 35 of the 136 public airports (26%) complied with the model ordinance's minimum safety zone dimensions. Seventeen (12.5%) of the state's public airports, primarily those with turf runways, did not, as of January 2006, comply with the minimum safety zone requirements. See summary Table 2-1 below.



*Some airports, such as the one featured above, currently have no zoning regulations for their airport.*

**TABLE 2-1: MINNESOTA AIRPORT ZONING SUMMARY (2006)**

Number of Public Airports [Notes 1 and 2]:		
Exceeding Minimum Ordinance Standards for Safety Zones:		84
Meets Minimum Ordinance Standards for Safety Zones:		35
<b>Subtotal</b>		<b>119</b>
Does Not Meet Minimum Ordinance Standards for Safety Zones:		
	MAC airports	6
	Airports with turf runways (Master plan review required) [Note 3]	11
<b>Subtotal</b>		<b>17</b>
<b>Total Airports</b>		<b>136</b>
<p><b>Note 1:</b> There are 23 airports with zoning in place for future runways that are not constructed to date. These future runways are not included in the totals indicated above.</p> <p><b>Note 2:</b> A detailed list of airports used to compile this table can be found in Appendix 3.</p> <p><b>Note 3:</b> Safety zoning for turf runways at public airports will be reviewed during the Master Plan process; Mn/DOT expects all safety zoning for turf runways to comply with Minnesota Statutes, Chapter 360, or else cease operations.</p>		
<p><i>Source: Mn/DOT Office of Aeronautics, 2006</i></p>		



### The State Model Airport Zoning Ordinance and Airport-Compatible Land Uses

While the state model airport zoning ordinance provides an easy-to-use approach to airport protection through the device of the three protective zones (A, B and C), as noted earlier, the model ordinance is just a starting point in that it recommends only a very abbreviated list of compatible and incompatible uses. Some increasingly common uses like cell towers and wind turbines are not addressed at all. Based on a national survey, Mn/DOT has developed a more extensive, fine-grained list of uses that local governments can use to guide their decisions to allow, permit with conditions, or prohibit specific land uses in the three airport safety zones. This updated use list can be used to supplement the model ordinance in determining compatible uses in local airport zone districts or overlays (See Chapters 3 and 6 of this manual).

However, these use provisions will only be effective if implemented at the local level. This is not always the case today, although in some instances local governments enacted more stringent requirements. In 11 ordinances, or 8.5% of the 130 airport zoning ordinance texts surveyed by Mn/DOT, there are departures from the state model ordinance in their treatment of allowed or prohibited land uses within Safety Zones A and B. In several ordinances, existing residential or assembly land uses that would otherwise be prohibited and treated as nonconforming uses under the model airport zoning provisions for Safety Zones A or B, are specifically exempted (“grandfathered”) from these ordinance’s land use restrictions and treated as conforming uses.

Several of these ordinances also expanded the types of uses or density of uses allowed in the safety zones. One airport zoning ordinance prohibits many specific types of assembly and high-density uses from Safety Zone B, such as nursing homes and all densities of new residential development, but does not contain the model’s general prohibition on assembly type uses (i.e., the model limits the maximum number of persons that can congregate on a given-size parcel within Safety Zone B). In addition, the ordinance does not require a minimum 3-acre parcel size for new development within Safety Zone B, as stated in the model ordinance. In a different airport zoning ordinance, assembly uses in which no more than 100 persons are congregated for no more than two consecutive hours are allowed, which is a more liberal allowance than permitted under the model ordinance. Similarly, another ordinance allows new development in Safety Zone B on as small as 2.5-acre parcels, rather than the minimum 3-acre parcels allowed under the model ordinance.

In contrast, a few ordinances, primarily those applicable in more rural townships and counties, were more stringent than the state requirements. For example, several ordinances applicable in rural townships and counties required a minimum five-acre development parcel size for new uses in Safety Zone B—a more stringent

**FIGURE 2-1: HISTORY OF AIRPORT ZONING IN MINNESOTA**

1925	Minnesota develops some form of aviation regulatory statutes		
		Minnesota State Department of Aeronautics absorbs the Minnesota Aeronautics Commission	1943
1944	Drafted Model Zoning Act		
1945	Minnesota Airport Zoning Act		
		First Minnesota Model Airport Zoning Ordinance	1946
1958	Minnesota State Zoning established after recommendations in the Doolittle report		
		Metropolitan Council established	1967
		Change in Land Use Standards and safety zones for airports	1969
1973	Airports are required to zone with due diligence		
		Change in Safety Zone lengths	1974
1975	Changed “Land-Use Zoning Standards” to “Airport Zoning Standards”		
		Airport zoning standards: Protection of Existing Neighborhoods amendment passed	1978
1979	Revised Model Zoning Ordinance		
		<i>McShane v. City of Faribault</i>	1980
1983	Minnesota Statutes Annotated		
		Updated Minnesota Model Airport Zoning Ordinance	1990



requirement than the model ordinance's suggested 3-acre minimum. The ordinance for one small regional airport also sets a minimum one-acre parcel size for Safety Zone C, an element not required by the model ordinance.

Consideration of the modern airport compatible land use list set forth in Chapters 3 and 6 of this manual may help rationalize the use restrictions in Zones A and B throughout the state. However, based on the interviews and best practices research conducted for this Manual, it appears the issue of appropriate land uses in Safety Zone C will likely become more important in the future. Currently, the minimum Minnesota standards and rules do not restrict specific uses or population density in Safety Zone C, and consequently, some jurisdictions have permitted significant residential and other potentially incompatible development relatively close to the ends of active runways and to the extended runway centerlines. These Safety Zone C areas often become problems if a runway is lengthened or reconfigured and permitted uses that were previously allowed are now potential safety issues. (When a runway is changed in length or orientation, all the safety zones for that runway will change correspondingly.) Local implementing bodies are authorized to exceed the state minimum airport zoning regulations and therefore may, on their own initiative, choose to regulate residential uses and development densities in all or parts of Safety Zone C.

## HEIGHT RESTRICTIONS

In addition to use regulations, a key aspect of airport safety zoning is typically restrictions on the height of buildings and structures near airport runways. These height restrictions, required by both Minnesota and federal law, aim to prevent interference with aircraft flight as well as ensure safety of persons on the ground. Minnesota has adopted obstruction prohibitions in its administrative rules that are very similar to the federal height obstruction regulations adopted in FAR Part 77 ("Objects Affecting Navigable Airspace").<sup>16</sup>

Minnesota statutes, as reflected in the state model airport zoning ordinance, limit applicability of airport height restrictions to a distance "not to exceed one and one half miles beyond the perimeter of the airport boundary and in that portion of an airport hazard area under the approach zone for a distance not exceeding two miles from the airport boundary." The operative restriction provides that "no structure or tree shall be constructed, altered, maintained, or allowed to grow in any airspace zone ... so as to project above" any of the specified airspace surfaces contained in Zones A, B or C."

Importantly, when a local government adopts the model airport zoning ordinance, which is consistent with Federal Aviation Administration regulations, the local zoning rules apply instead of the state permitting

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<sup>16</sup> See Minnesota Rules, Rule 8800.1200 (Criteria for Determining Air Navigation Obstructions) and FAR Part 77, Subpart C (Obstruction Standards).



## BENEFITS OF AIRPORT HAZARD AREA SAFETY ZONING

- Supplements federal airspace protections with state and local ground-based off airport land use protections, as intended.
- Provides a transitional approach to land use development to stabilize land values by incorporation within municipal comprehensive plans.
- Prevents concentrations of people from being injured or killed, and residential and commercial property from being destroyed.
- Provides a clear visual approach to the runway within densely developed urban areas.
- Protects the future utility of the airport.
- Protects the existing and future public investment in the airport.
- Creates a fixed or readily ascertainable standard that may exempt public entities from tort liability.

requirement.<sup>17</sup> The state model airport zoning ordinance contains specific height restrictions within the various defined imaginary airspace surfaces or zones (i.e., primary surface, approach surface, horizontal surface, transitional surface, and conical surface). Interestingly, in 56 of the 130 airport zoning ordinances reviewed by the state, or 44% of the surveyed ordinances, the horizontal airspace zone was established by specifying a lower, more restrictive vertical height than the 150 feet required in the model ordinance and by FAA regulations. Fifty-three of these 56 ordinances used 100 feet rather than 150 feet, while the other three ordinances used 75 feet.

If a local government adopts conforming regulations and assumes authority over height restrictions in navigable airspace, the federal government—through the Federal Aviation Administration—still plays an important and valuable role in any local decisions to approve or deny tall structures that may affect airport operations or aircraft safety. First, the model airport zoning ordinance as well as the requirements contained in federal regulations (FAR Part 77)<sup>18</sup> should form the basis of the local height restrictions. Second, if local jurisdictions receive an application to erect a tall structure near an airport, local decision-makers would be well-advised to ask the FAA to complete an aeronautical study of a proposed tall structure project and issue a determination of “No Hazard to Air Navigation.” The standard procedure is to submit FAA Form 7460-1 to the FAA. Local approval should be withheld until comments from both the FAA and Mn/DOT are received. The FAA will offer its opinion as to whether a proposal would be hazardous to air navigation; however, federal law specifically reserves final decision-making authority to the local level. Similarly, an FAA determination of “no hazard” does not constitute development approval that overrides local permitting authority.

## GENERAL RESTRICTIONS

Virtually all airport zoning regulations state similar general “performance standards” for uses and development in all airport safety zones. Performance standards do not specifically prohibit or allow a particular type of use. Instead, performance standards establish limits related to the

<sup>17</sup> To our knowledge, the state does not issue permits for tall structures at any of the state’s public airports, because all but three of the public airports are operating under an effective zoning ordinance. At the three MAC airports that do not have airport zoning in place, Anoka, Flying Cloud, and Lake Elmo, federal FCC rules or FAA Rule 7460 apply.

<sup>18</sup> According to federal regulations outlined in FAR Part 77 (“Objects Affecting Navigable Airspace”), any object or structure that penetrates any of the “imaginary surfaces” outlined in FAR Part 77 is considered to be an obstruction to air navigation. The regulations contained in FAR Part 77 attempt to accomplish the following: Establish standards and requirements for notice to FAA of proposed construction or alteration of a structure that may impact aviation and therefore requires a study for aeronautical effect; establish standards for determining which structures will be obstructions to air navigation; provide for studies of obstructions to determine their effect on the safe and efficient use of airspace; provide authority for public hearings and other reviews to examine the potential for hazardous effects to air navigation of proposed construction or alterations; and reference guidelines for marking and lighting obstructions to air navigation. If an object is identified as an obstruction, but does not adversely affect a significant volume of air traffic, it is determined not to be a hazard to air navigation.



creation of adverse impacts on overhead flight or to persons or property on the ground. No use, regardless whether permitted under the applicable airport zoning regulations, can operate or perform in a way that exceeds the specified limits.

In most referenced zoning ordinances, performance standards prohibit any use in the proximity of an airport that:

- (1) Is tall enough to be hazardous to the navigation of aircraft, including tall buildings, smokestacks, construction cranes, trees, and cell towers. FAA Part 77 regulations address these hazards by establishing airspace surfaces above which structures or trees must not protrude. Many airport zoning regulations reference and incorporate the FAA Part 77 height provisions.
- (2) May interfere with electronic navigation aides such as radar facilities and instrument landing systems that provide for the safe movement of aircraft. These aides may be located on-airport or off. Non-aviation electronic sources placed near electronic navigation aides may cause interference. Similarly, new structures may block the navigation aid signals. Both these types of situations must be reviewed prior to the placement of such uses and structures.
- (3) May cause a visual distraction to pilots approaching the airport. Distractions can occur from outdoor lights near an airport (e.g., high mast lighting or stadium lighting), from highly reflective exterior building materials, or from water surfaces. Smoke generated by nearby businesses, industry, or field burning can also create severe visual difficulties for pilots. Activities that generate a lot of dust can cause similar problems.
- (4) Has the potential to attract hazardous wildlife such as birds. These uses include wetlands, ponds, stormwater retention facilities, and landfills, which offer excellent habitat for avian wildlife and flocks of bird. The goal is to avoid interaction between such wildlife and aircraft in flight or on the ground.

In Minnesota's 1990 model airport zoning ordinance, several of these performance standards are found in Section V.B.1, which states:

“No use shall be made of any land in any of the safety zones defined in Subsection V.A. which creates or causes interference with the operations of radio or electronic facilities on the airport or with radio or electronic communications between the airport and aircraft, makes it difficult for pilots to distinguish between airport lights and other lights, results in glare in the eyes of pilots using the airport, impairs visibility in the vicinity of the airport, or otherwise endangers the landing, taking off, or maneuvering of aircraft.”

Other types of performance standards include minimum open space criteria for each safety zone. Large open areas near airport runways are desirable, especially at smaller general aviation airports, because pilots of smaller planes often can control the aircraft and attempt an emergency landing. California, for example, suggests local airport compatibility land use plans include open space criteria (e.g., a minimum percentage of each safety zone



that should remain “open” and undeveloped). Local zoning authorities are encouraged to consider requiring clustering of private structures—especially on large parcels nearest the airport that are under single ownership or control.

## PROCEDURE FOR ADOPTION AND APPROVAL OF LOCAL AIRPORT SAFETY ZONING

The Office of Aeronautics has established a straightforward process for the adoption of local airport safety zoning by joint zoning boards and approval of the ordinance by the state.<sup>19</sup> These steps are outlined briefly below and are discussed in greater detail in Chapter 6, *Model Airport Safety Zoning Ordinance and Procedural Guide*:

### **1. ESTABLISH ZONING BOARD**

The airport owner has two options for how airport zoning is adopted: (a) Request creation of a joint zoning board, or (b) Request a county or other municipality to individually adopt and enforce airport zoning regulations for the area in question that conform to minimum standards prescribed by the Mn/DOT Commissioner.

### **2. DRAFT ZONING ORDINANCE & MAP**

The zoning board, working with an attorney, an engineer, and the Minnesota Department of Transportation, Office of Aeronautics, drafts an airport zoning ordinance and map. (Mn/DOT furnishes a model ordinance and map to be used as guidance.)

### **3. MN/DOT OFFICE OF AERONAUTICS FIRST REVIEW**

Mn/DOT will review and advise the zoning board on the draft ordinance proposal before the first public hearing.

### **4. PREPARE FOR PUBLIC HEARING**

Zoning board passes a resolution declaring this ordinance to be their proposed ordinance, setting a date and place for public hearing. The zoning board gives mailed and advertised notice of the hearing as specified by the state (e.g., to adjacent local governments and affected property owners).

### **5. FIRST PUBLIC HEARING**

Hold the first hearing. After the hearing, the board will pass one of the following resolutions: (a) If no changes are necessary, a resolution is passed stating that a public hearing was held, that no changes are necessary, and that this proposed ordinance will be submitted to the Mn/DOT Office of Aeronautics for approval, or (b) If changes are desired, the proposed ordinance is amended and a resolution is passed declaring the amended ordinance to be the newly proposed ordinance and that this proposed ordinance will be submitted to the Mn/DOT Office of Aeronautics for approval.

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<sup>19</sup> Zoning procedures are based on Minnesota Statutes Chapter 360, sections 360.061 to 360.074.



#### **6. MN/DOT REVIEW AND COMMISSIONER'S ORDER**

Submit proposal to the Mn/DOT Office of Aeronautics for approval. Upon review for approval, the Commissioner of Mn/DOT will determine whether the proposal conforms to the minimum standards. If no objections are made, the proposed ordinance is issued a Commissioner's Order of Approval. If the Commissioner objects on grounds that such regulations do not conform to the minimum standards, the zoning board shall make such amendments as are necessary to meet such objections.

#### **7. SECOND PUBLIC HEARING**

Follow same procedures as for the first public hearing. Resubmit ordinance proposal to the Mn/DOT Office of Aeronautics if, at the public hearing it was decided to amend the proposed ordinance. Repeat steps 4 and 5 above. If the changes were not substantial, a new Commissioner's Order need not be issued. If substantial changes have been made, then final adoption shall not take place until after final approval by the Commissioner.

#### **8. ADOPT ORDINANCE**

#### **9. FILE ORDINANCE WITH COUNTY RECORDER**

#### **10. SUBMIT REQUIRED DOCUMENTS TO MN/DOT**

## ***Federal System – Compatible Land Uses and Airport Safety***

Like the State of Minnesota, the federal government (through the FAA) has taken steps to establish safety zones to protect runways from incompatible land uses. It has also adopted procedures to review potential obstructions to navigable airspace. However, the federal rules and regulations tend to be focused much more narrowly on the areas immediately adjacent to runways (similar to the Minnesota Safety Zone A), and mainly on areas within airport boundaries. Moreover, in most instances, the FAA and federal government do not exercise direct regulatory control over potentially incompatible land uses. The FAA offers guidance and advice to local governments and others, but defers to them in the final analysis. This section focuses on the two primary areas of federal concern—runway protection and airspace protection. It is important to note that airports that are not a part of the federal system – i.e., airports that do not receive federal assistance – are exempt from these federal airport safety regulations. In Minnesota, 44 public airports fall into this category of federally exempt facilities.



## RUNWAY PROTECTION

Runway safety areas, as defined by FAA Advisory Circular 150/5300-13, *Design Standards*, are created for the safe and efficient operation of an airport and to protect people on the ground. While there are many design requirements contained in the advisory circular, this section focuses only on the runway protection and airspace protection zones associated with runway approaches and ends. While runway protection standards focus on potential hazards and acceptable uses, the FAR Part 77 airspace protection standards discussed in the following sections concentrate on above-ground clearances and air navigation obstructions.

### ***Runway Protection Zones***

Formerly known as “clear zones,” runway protection zones (RPZs) were originally established to define land surface areas underneath aircraft approach paths. Allowing airport operators to control these areas was important in preventing the creation of airport hazards or the development of incompatible land use. First recommended in a 1952 report by the President’s Airport Commission titled “The Airport and Its Neighbors,” the establishment of clear areas beyond runway ends was deemed worthy of federal management.

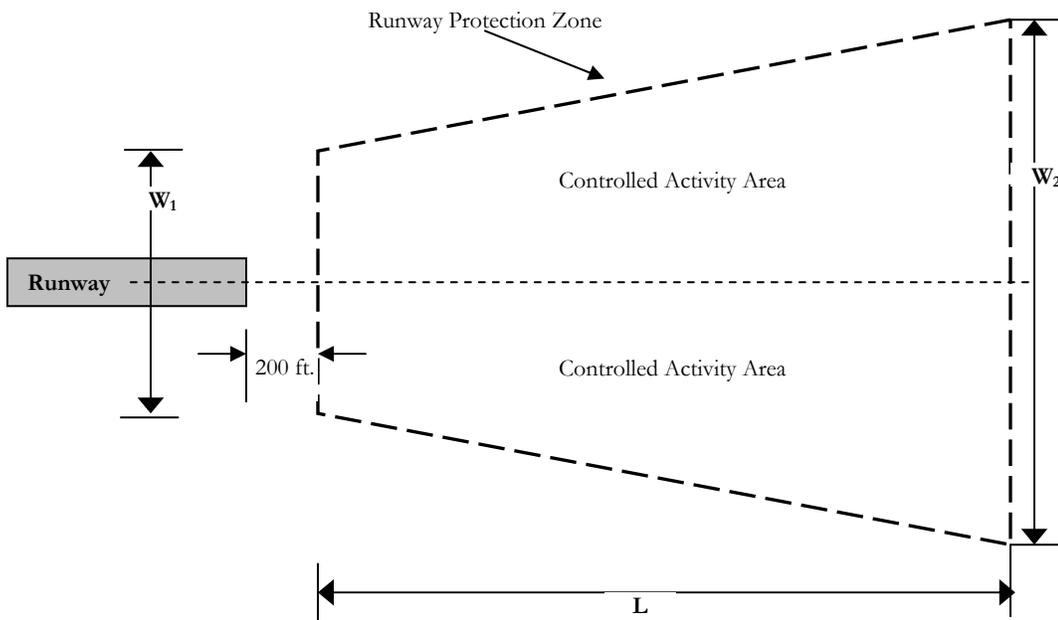
Providing these clear areas was intended to preclude obstructions potentially hazardous to aircraft and to control building construction for the protection of people on the ground. The US Department of Commerce concurred with the recommendation on the basis that this area was “primarily for the purpose of safety for people on the ground.” The FAA adopted clear zones with dimensional standards to implement the commission’s recommendation.

Recommended guidelines included clear zones being kept free of structures and developments that would create a place of public assembly. Today, clear zones are referred to as “RPZs,” and their function remains to protect aircraft and people on the ground. See Figure 2-2 for an illustration of RPZ dimensions.

The RPZ can extend beyond the airport property. Therefore, from an off-airport land use compatibility planning perspective, the RPZ is the most critical safety zone identified by the FAA design standards. The FAA recommends that, whenever possible, the entire RPZ be owned by the airport and be clear of all obstructions if practicable. When this is impractical, the FAA recommends obtaining easements sufficient to control the land use. Acquisition of this property by federal system airports is eligible for FAA grants (small airports that are not part of the federal airport system are ineligible). Even on portions of the RPZs not under airport control, the FAA recommends (but does not require) that churches, schools, hospitals, office buildings, shopping centers, and other places of public assembly, as well as fuel storage facilities, be prohibited. Automobile parking is considered acceptable only on the outer edges of RPZs.

Beyond the runway protection zones, the FAA recommends few additional safety-related land use measures other than airspace protection. It is in these areas that the Minnesota safety zone restrictions become particularly important because they are legally enforceable. However, additional property can also potentially be acquired with federal grants if necessary to restrict the use of the land to activities and purposes compatible with normal airport operations. In general, this property must be situated in the approach zones within a distance of 5,000 feet from the runway primary surface. Exposure to high levels of noise can also be the basis for FAA funding of property acquisition.

**FIGURE 2-2: RUNWAY PROTECTION ZONE DIAGRAM**



The RPZ is a trapezoidal area that begins at a point 200 feet beyond the end of the runway. The length ( $L$  in Figure 2-2) of the RPZ extends 1,000, 1,700, or 2,500 feet, depending on the category of runway and type of approach (visual, non-precision, or precision). The inner width of an RPZ is located closest to the runway end with the outer width extending out beyond the runway end. The inner width ( $W_1$  in Figure 2-2) ranges from 250 to 1,000 feet, and the outer width ( $W_2$  in Figure 2-2) ranges from 450 to 1,750 feet. The inner and outer widths are also dependent on the runway category and approach type.



## ***Airspace Protection***

Part 77 of the Federal Aviation Regulations (FAR), *Objects Affecting Navigable Airspace*, establishes standards for determining obstructions to navigable airspace and the effects of such obstructions on the safe and efficient use of that airspace. Additionally in Part 77, regulations require that the FAA be notified of proposed construction or alteration of objects—whether permanent, temporary, or of natural growth—if those objects would be of a height that exceeds the FAR Part 77 criteria.<sup>20</sup> The height limits are defined in terms of imaginary surfaces in the airspace extending about two to three miles around airport runways and approximately 9.5 miles from the ends of runways having a precision instrument approach. As noted earlier, Minnesota has codified its own administrative rules very similar to the federal FAR Part 77 airspace surface regulations. See Minnesota Rules, Rule 8800.1200 (2005).

As shown in Figures 2-3 and 2-4, the imaginary surfaces outlined in FAR Part 77 include the:

- Primary surface
- Transitional surface
- Horizontal surface
- Conical surface
- Approach surface

FAR Part 77 surfaces were devised by the FAA to protect specific airspace areas while, as discussed earlier, runway protection standards are intended to protect specific ground areas. The dimensions of FAR Part 77 surfaces vary depending on the type of runway approach.

When notified of a proposed construction, the FAA conducts an aeronautical study to determine whether the object would constitute an airspace hazard. Simply because an object would exceed an airport's airspace surfaces established in accordance with FAR Part 77 criteria does not mean that the object would be considered a hazard. Various factors, including the extent to which an object is shielded by nearby taller objects, are taken into account. The FAA may recommend marking and lighting of obstructions. The FAA has no authority to remove or to prevent construction or growth of objects deemed to be obstructions. Local governments having jurisdiction over land use are typically responsible for establishing height limitation ordinances which prevent new, and enable removal of existing, obstructions to the FAR Part 77 surfaces.

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<sup>20</sup> In addition, pursuant to Minnesota Rule 8800.1200, all proposed construction or alteration of objects that would exceed the FAR Part 77 height criteria should be submitted to Mn/DOT, Office of Aeronautics, for review.



Federal action in response to new airspace obstructions is primarily limited to three possibilities:

- For airports with instrument approaches, an obstruction could necessitate modification to one or more of the approach procedures (particularly greater visibility and/or cloud ceiling minimums) or even require elimination of an approach procedure.
- Airfield changes such as displacement of a landing threshold could be required (especially at airports certificated for commercial air carrier service).
- The owner of an airport could be found in noncompliance with the conditions agreed to upon receipt of airport development or property acquisition grant funds and could become ineligible for future grants (or, in extreme cases, be required to repay part of a previous grant).

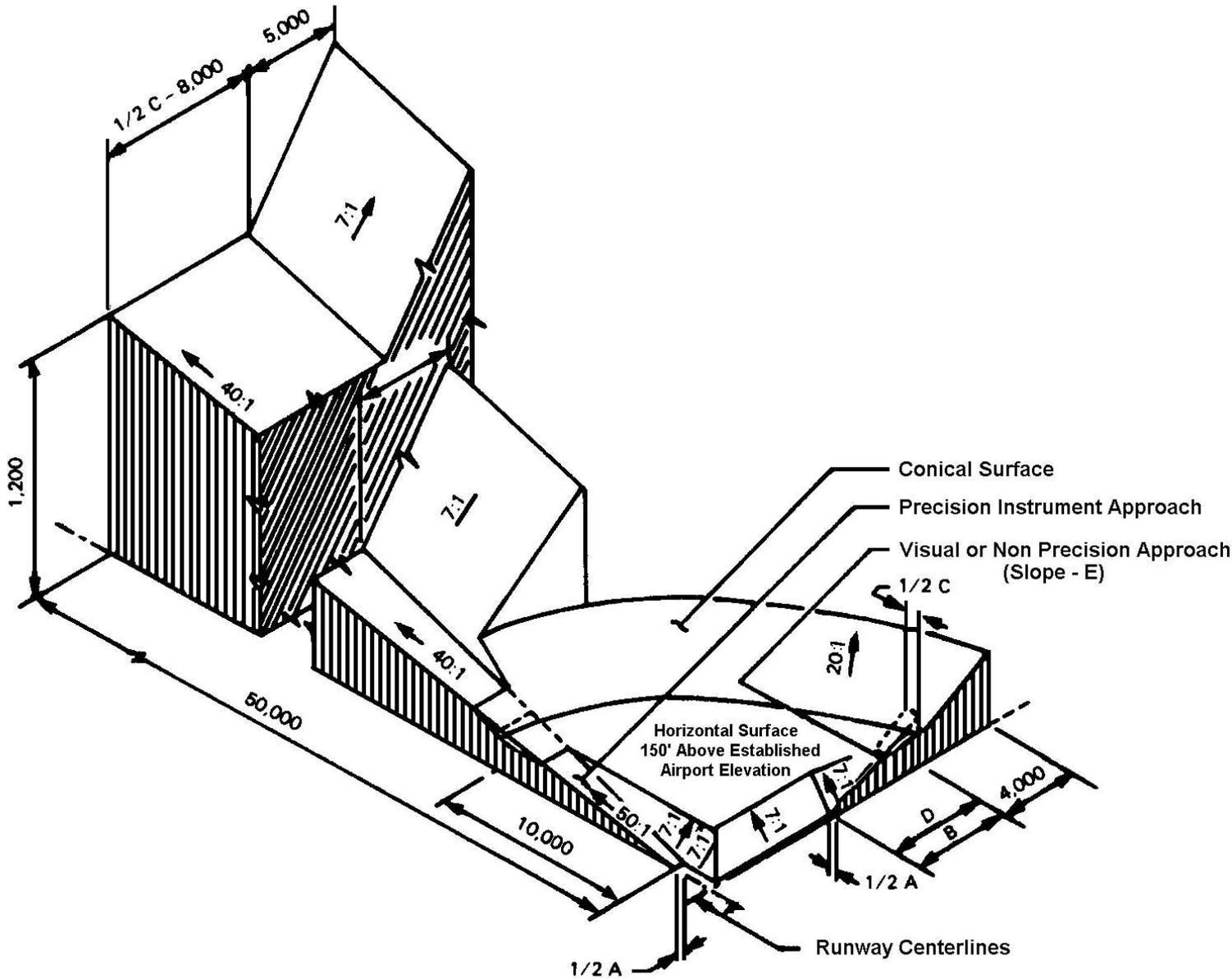
Additional guidelines regarding protection of airport airspace are set forth in other FAA documents. In general, these criteria specify that no use of land or water anywhere within the boundaries encompassed by FAR Part 77 should be allowed if it could endanger or interfere with the landing, take off, or maneuvering of an aircraft at an airport (FAA–1987). Specific characteristics to be avoided include:

- Creation of electrical interference with navigational signals or radio communication between the airport and aircraft;
- Lighting which is difficult to distinguish from airport lighting;
- Glare in the eyes of pilots using the airport;
- Smoke or other impairments to visibility in the airport vicinity; and
- Uses which attract birds and create bird strike hazards.

Bird strike and other forms of wildlife hazard have become a major concern internationally. In the United States and Canada, reduction and management of wildlife hazards are of particular concern. With regard to bird strike hazards, the FAA specifically considers waste disposal sites (sanitary landfills) to be incompatible land uses if located within 10,000 feet of a runway used by turbine-powered aircraft or 5,000 feet of other runways. Any waste disposal site located within five statute miles of an airport is also deemed incompatible if it results in a hazardous movement of birds across a runway or aircraft approach and departure paths. Caution should be exercised with regard to certain other land uses—including golf courses and some agricultural crops—in these locations to ensure that wildlife hazards do not result (FAA–1997). Additionally, Federal statutes (49 U.S.C. §44718(d)) now prohibit new “municipal solid waste landfills” within six miles of airports that (1) receive FAA grants and (2) primarily serve general aviation aircraft and scheduled air carrier operations using aircraft with less than 60 passenger seats. A landfill can only be built within six miles of this class of airports if the FAA concludes that it would have no adverse effect on aviation safety (FAA–2000b).



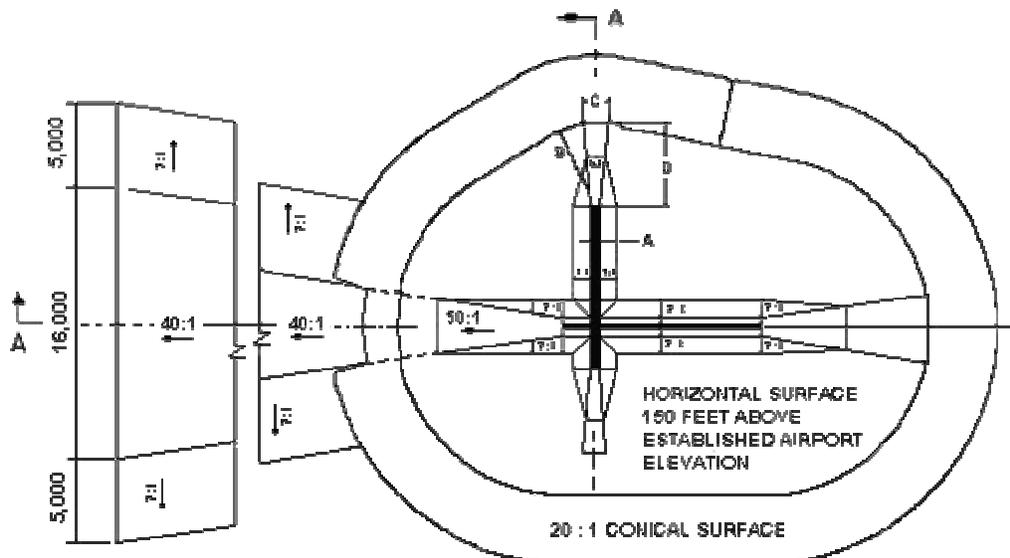
FIGURE 2-3: 3D DIAGRAM OF FAR PART-77 SURFACES



Source: [www.ngs.noaa.gov/AERO/oisspec.html](http://www.ngs.noaa.gov/AERO/oisspec.html)



FIGURE 2-4: PLAN VIEW OF FAR PART-77 SURFACES



Source: [www.ngs.noaa.gov/AERO/oisspec.html](http://www.ngs.noaa.gov/AERO/oisspec.html)

TABLE 2-2: OBSTRUCTION IDENTIFICATION SURFACES -- FEDERAL AVIATION REGULATIONS PART 77

Dimension (Note 1)	Item	Dimensional Standards (Feet)					Precision Instrument Runway
		Visual Runway		Non-Precision Instrument Runway			
		A	B	A	B		
				C	D		
A	Width of Primary Surface and Approach Surface Width at Inner End	250	500	500	500	1,000	1,000
B	Radius of Horizontal Surface	5,000	5,000	5,000	10,000	10,000	10,000
		Visual Approach		Non-Precision Instrument Approach			Precision Instrument Approach
		A	B	A	B		
					C	D	
C	Approach Surface Width at End	1,250	1,500	2,000	3,500	4,000	16,000
D	Approach Surface Length	5,000	5,000	5,000	10,000	10,000	*
E	Approach Slope	20:1	20:1	20:1	34:1	34:1	*

Note 1: See Figure 2-4 above.

Source: [www.ngs.noaa.gov/AERO/oisspec.html](http://www.ngs.noaa.gov/AERO/oisspec.html)



## *Successes and Challenges With Current Minnesota Approach Toward Airport Safety*

Despite an assortment of tools and regulations and funding sources, airports throughout Minnesota continue to struggle to stop or mitigate the potential adverse impacts of incompatible land uses. Why? The reasons are both simple and complex.

Between the State of Minnesota and the FAA, there are a wide array of tools, regulations, and funding sources to address potentially incompatible land uses around airports and obstructions to navigable airspace. Moreover, local governments in Minnesota have ample authority to plan for, enact, and enforce protective land use measures. Indeed, it appears that local airport zoning ordinances have been adopted for the vast majority of Minnesota public airports.

However, despite this assortment of tools and the creation of joint airport zoning boards, airports throughout the state continue to struggle to stop or mitigate the potential adverse impacts of incompatible land uses. Why? The reasons are both simple and complex. In many cases, it is often lack of knowledge about the long-term and cumulative impacts of local land use decisions on the near-by airport's future viability and flexibility to respond to the traveling public's demands. Often, the challenge boils down to balancing airport protection needs with local desires for economic development and growth that can produce jobs and tax revenues to support local government services. In this situation, the local government that is pushing for potentially incompatible development is typically independent of the jurisdiction owning or operating the airport. Local officials in those jurisdictions are often hard-pressed to see the long-term advantages of airport protection when there are obvious short-term economic gains to be had.

In other instances, local governments have been inclined to enact protective regulations, but have shied away because of the specter of having to pay damages to landowners who claim the value of their property has been illegally diminished by airport land use controls. Because of peculiarities in Minnesota land use law, such claims have sometimes been upheld in state court, thus giving localities pause.

This section summarizes these and other challenges documented in the extensive survey Mn/DOT commissioned in 2004 and discusses recommendations for best practices that may begin to address them.

### **KEY FINDINGS FROM THE ORDINANCE REVIEW**

As a first task in creating an airport land use compatibility manual for the State of Minnesota, the Office of Aeronautics commissioned a comprehensive review of all airport zoning ordinances in effect around the state. This review was intended to confirm compliance with the state's minimum requirements for regulating airport hazard areas, as codified in



Chapter 360 of the Minnesota public statutes. In addition, the review was intended to shed light on the efforts of airport-area jurisdictions to tailor the state's model zoning ordinance to accommodate special local conditions.

The following are a summary of the key findings from the ordinance review, which was conducted in the Fall of 2004. A table summarizing these findings in more detail may be found in Appendix 3 of this Manual.

### **1. *With Only Minor Variations, Most Local Ordinances Follow the State's Model Ordinance***

In total, 70 of the 130 airport zoning ordinances surveyed, or 54%, followed the state 1990 model ordinance verbatim, with no changes to the model's substantive text provisions. Most of the remaining ordinances (46 ordinances or 35%), followed the state model text with only a deviation in the height of the horizontal airspace zone (nearly all of these ordinances set the height of the horizontal zone at 100 feet above mean airport elevation instead of 150 feet as stated in the model). Together, these two groups represent 89% of the total number of ordinances reviewed. In other words, nearly all the ordinances reviewed are in technical compliance with the statutes by virtue of having adopted the minimum requirements in the text of their ordinances, or more restrictive standards, under Minnesota law.

### **2. *Two-Thirds of the Airport Ordinances Were Adopted or Last Amended More Than 25 Years Ago***

Nearly two-thirds, or 85 of the 130 ordinances reviewed, were adopted or last amended before 1980. Thus, in many cases, at least 25 years have elapsed since the affected communities took a critical look at their airport protection and safety regulations. The age of the zoning ordinance should not necessarily determine the need for its amendment; instead, what matters more is how much local circumstances (i.e., growth and evolving land use patterns) have changed since the ordinance was originally adopted. While in some instances, the patterns of growth over time have not necessitated a detailed review, at other airports, growth pressures have increased at their boundaries, raising the question whether these communities have actively ensured that their ordinances can still do what was originally intended when adopted more than two decades ago.

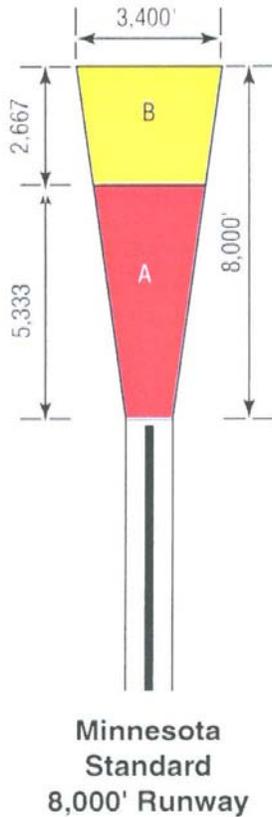
### **3. *Virtually All the Ordinances Were Drafted and Adopted by a Joint Zoning Board***

Virtually all the ordinances were drafted and adopted by a joint zoning board, signaling the fact that most airport zoning solutions in Minnesota require the cooperation of multiple jurisdictions. The other option allowed under the law and model ordinance is for all affected jurisdictions to act individually to adopt their own zoning ordinances in compliance with the model's minimum zoning requirements. Individually adopted zoning ordinances were in place at only 15 airports, or 12% of all airports reviewed. All 15 of these airports, except one, are located in municipalities where the



same municipality owns the airport and controls all the affected land area around the airport. The exception is one airport, where the joint zoning board was recently dissolved and where, instead, each of the three affected communities adopted and now administer and enforce their own separate (but very similar) airport zoning ordinances.

#### 4. *The Size and Shape of the Land Use Safety Zones Have Been Changed In Only a Few Instances*



The state model ordinance is very clear in setting the minimum dimensions of the three airport safety zones (Safety Zones A, B, and C). The two primary safety zones, A and B, are intended to include all land under a runway's approach zones, extending a distance, respectively, of two-thirds and one-third the planned length of the runway. This results in both Zone A and B being trapezoid in shape—with the more narrow end of the trapezoid lying closest to the end of the runway and expanding outward from there to complete the shape (see example figure at left). The use prohibitions and density restrictions in the ordinance apply only within the established Safety Zones A and B.

In its survey of airport zoning ordinance text, Mn/DOT found four adopted or pending ordinances that established or requested airport safety zone dimensions that deviated from the model ordinance's specifications. The four ordinances, and their different justifications for the variations that are noteworthy, are summarized below:

##### **AIRPORT CASE STUDY 1**

A pending amendment to this airport's original ordinance would change the dimensions of Safety Zone A to make it more narrow than required under the model ordinance. The length of Safety Zone A would remain unchanged, and no changes are planned to the dimensions of Safety Zone B. This airport's authority is working closely with Mn/DOT staff on the pending amendment, and is requesting the change for two reasons. First, the airport has been on the losing side of multiple lawsuits challenging the application of Zone A restrictions to 17 different properties. The winning parties to these lawsuits were allowed to establish uses in Safety Zone A contrary to the state's model zoning use restrictions. Second, the airport has made an interesting case for a reduction in the safety zone dimensions based on accident and third-party risk data and research for the type of traffic that predominates at that airport (more than 75% of the airport's traffic is comprised of commercial traffic flown by, typically, higher-trained pilots with better accident track records). For both these reasons, the airport proposes (1) moving its runway several hundred feet in order to move the existing, encroaching uses out of Zone A and into Zone B, and (2) the reduction in the width of Zone A described above.

##### **AIRPORT CASE STUDY 2**

With the recent construction of a new runway, this airport updated its zoning ordinance. The airport decided to zone for the ultimate length of the runway. However, strict application of the safety zones would



have created a nonconforming use of an existing home located on the side edge of the proposed Safety Zone A, about three-quarters of the length of the zone (or farther away) from the runway. The home is located on the shore of the Mississippi River and other land use restrictions are in place as a result of waterway rules. The owner requested the zoning be adjusted so that his home would be located in Safety Zone B, rather than in Zone A. By dividing Zones A and B along the centerline of the Mississippi River, Zone A will become larger in size than it would have been by strict application of the model ordinance. In return, Zone B will be smaller by an equal amount, and the existing home will fall into Zone B where it will meet the standards.

### **AIRPORT CASE STUDY 3**

A recently adopted amendment to the zoning ordinance applicable at this airport changed the dimensions of Safety Zone A to match the boundaries of the federally-mandated runway protection zone (“RPZ”). This reduced the length of Safety Zone A for all of the airport’s runways by 2,100 feet, and kept Zone A primarily within airport boundaries. The total length of both Safety Zone A and Zone B did not change for any of the airport runways from what had been adopted in the previous ordinance. The cumulative effect of these changes is to shift 2,100 feet (by length) of land and land use from being regulated as Zone A into the newly constituted Zone B. The change was based on an analysis of airport accident data compiled by the FAA, NTSB and ALPA, and third-party risk standards provided by the FAA.

In approving the change to the safety zone boundaries, the Mn/DOT Commissioner justified the amendment based on the airport authority’s demonstration that “the social and economic costs of restricting land uses in accordance with existing state zoning standards outweigh the benefits of a strict application of those standards,” as allowed under Minnesota Statutes, Section 360.063, subd. 2 (2002).

### **AIRPORT CASE STUDY 4**

In a 1995 amendment to its ordinance, this airport’s joint zoning board adopted a change in the Zone A dimensions for one of the airport’s three runways, making that Zone A more narrow and longer than otherwise required by the state’s rules. According to municipal officials, the change was made to exclude an existing residential trailer park, comprised of between 40 to 60 trailers, from the Zone A use and density restrictions.

### **CONCLUSION**

Mn/DOT favors allowing flexibility in setting safety zone dimensions on a case-by-case basis, based on specific details of the airport area and operational uses at the airport. Thus, given the variations described above, and the likelihood that additional airports in the future will seek similar reductions in safety zone dimensions, Mn/DOT is considering adopting specific rules and regulations describing the review process for any safety zone modifications. Those rules would state the specific



evidence Mn/DOT will consider (such as practical hardship, economic benefits, social costs, airport accident data or third party risk research, and overall public safety), and the criteria by which Mn/DOT will review and decide such requests. See Chapter 6 of this manual for a description of the information and criteria Mn/DOT recommends using to make such decision.

### **5. Only Twenty Airport Zoning Ordinances Address Established Residential Neighborhoods (“ERNs”)**

Twenty ordinances (15% of all reviewed ordinances) referenced the statutory exemption for established residential neighborhoods (“ERN”), which allows preexisting (as of January 1, 1978) residential uses and lots located in an airport safety zone to continue as conforming uses regardless of the use restrictions under the applicable airport zoning regulations. However, two of these 20 ordinances include the relevant definitions for the ERN provisions, and the actual exemption language, while declaring that the jurisdiction actually does not contain any ERNs. Another two ordinances never use the term “established residential neighborhood” but set up specific residential exemptions using the statutory ERN scheme. The remainder followed the statutory provisions and model ordinance with no substantive text changes. In one instance, however, an airport zoning ordinance that followed the model took a significant step beyond the model. This particular zoning ordinance not only exempts existing residential uses and structures within an ERN from the ordinance’s use restrictions, but goes further to explicitly allow *new* residential development and expansion of existing residential structures in an ERN that is within Safety Zone B.

### **6. Many Ordinances Employed a More Restrictive Height to Establish the Boundaries of the Horizontal Airspace Zone**

The state model airport zoning ordinance defines the horizontal airspace zone to encompass the space below an imaginary horizontal surface measured 150 vertical feet above the established airport elevation. In 56 of the 130 airport zoning ordinances reviewed, or 44% of all ordinances, the horizontal airspace zone is established by specifying a lower vertical height than 150 feet. Fifty-three of these 56 ordinances used 100 feet rather than 150 feet, while the other three ordinances used 75 feet. The effect of using a lower vertical height, obviously, is to define a larger airspace in which an ordinance’s height restrictions will apply.

### **7. Several Ordinances Varied Their Treatment of Permitted and Prohibited Uses**

This discussion can be found in Chapter 3 of this manual.



## **8. Few Ordinances Deviated in their Treatment of Nonconforming Uses and Structures**

In only three ordinances, or 2.3% of the total zoning ordinances reviewed, did the treatment of nonconforming uses or structures differ substantially from the approach required under the state's model airport zoning ordinance. In two ordinances, the trigger for compliance with the ordinance after the destruction or deterioration of a nonconforming use or structure was lowered to 50%, versus the 80% destroyed/deteriorated trigger specified in the state rules. This 50% trigger is consistent with the minimum trigger allowed under the state's general planning and zoning enabling statutes, and may have been applied in the airport context to keep treatment of nonconformities consistent and equal across all land use types.

Only one ordinance reviewed specifically required the amortization of nonconforming uses or structures (including signs) that constituted airport hazards. This ordinance appears to apply the city's general amortization provisions to the airport zoning requirements within its code of ordinances. Therefore, it appears that the ordinance requires uses and structures nonconforming with the airport zoning restrictions to be eliminated through amortization within a reasonable period of time, tied to the type of building structure involved. However, this airport zoning ordinance was adopted in 1978, which was before the Minnesota legislature adopted new laws specifically prohibiting the use of amortization in the zoning context other than to eliminate public nuisances. It is unclear from the face of the ordinance whether the city has in fact considered how its airport zoning ordinance squares with the more recent state legislation, and whether the city has deliberately concluded that airport hazards are a public nuisance and therefore exempt from the new law's prohibition.

## **9. There Were Few Other Substantive and Significant Variations from the Model Ordinance's Zoning and Use Provisions**

### **THREE ORDINANCES PROVIDE FOR A SMALLER OR LARGER NUMBER OF AIRPORT SAFETY ZONES.**

In two instances, the ordinances established four safety zones instead of the three specified in the state model ordinance. In a third ordinance, only two safety zones were established rather than the minimum three required. In the latter case, the ordinance dates back to 1955 and may reflect an earlier version of the state model ordinance. It is our understanding that this airport zoning ordinance will be revised in the near future to match the current version of the model ordinance.

### **MANY ORDINANCES CHOSE TO EMPLOY AN ALREADY-EXISTING BODY TO ACT AS THE BOARD OF ADJUSTMENT FOR AIRPORT ZONING PURPOSES.**

At least 54 ordinances, or about 42% of all ordinances reviewed, designated an existing review body as the Board of Adjustment for airport zoning purposes, rather than constituting an entirely new body as allowed under the model ordinance. In these instances, the affected



jurisdictions typically designated the existing city or county board of zoning adjustment, planning commission, or city council as the body with authority to hear and decide variances and appeals under the airport zoning provisions.

**UNCERTAINTY REGARDING HAZARD LIGHTING REQUIREMENTS WAS FOUND IN SEVERAL ORDINANCES.**

Some of the airport zoning ordinances reviewed did not include the model ordinance provision giving the administrator or board of adjustment authority to condition the grant of a permit or variance on the applicant's installation of hazard lighting (at the applicant's cost). Without this provision on the face of such ordinances, it makes it appear that all hazard lighting is installed at the airport's expense.

**RECOMMENDED BEST PRACTICES**

Given the abundance of planning and zoning tools available to local governments and airports in Minnesota to protect airports and the almost universal compliance with state airport zoning requirements, one might conclude that there were few problems with incompatible land uses across the state. But on-the-ground experience shows otherwise. Increasingly, airports are struggling to prevent inappropriate land uses being developed too close to runways or obstructions to air navigation from being established. Clearly, there are some significant gaps and shortcomings that need to be addressed to achieve the goal of compatibility and protection of the public. The following is a list of recommended "best practices" that could help fill existing gaps and address these challenges. The reader can find many of these best practices incorporated into the new 2006 model zoning ordinance. In this section, and throughout the remainder of this manual and in Chapter 6's model zoning ordinance, best practices in the text are signified by a **BP** symbol in the margin.

**BP**

***Incorporate Airport Zoning Ordinances into Local Development Controls***

Implementing bodies responsible for adopting and administering airport zoning ordinances, including joint airport zoning boards, should ensure that all affected and participating municipalities actually incorporate or reference the adopted airport zoning ordinance in their official land use controls, including their zoning and subdivision regulations. Many instances exist today where the model airport zoning ordinance was adopted, but local land use regulations remained unchanged.

**BP**

***Allow Mn/DOT to Review Major Development Applications and Variance Requests***

To ensure that major developments receive adequate scrutiny, a local zoning agency may refer "major" airport zoning permit applications to Mn/DOT for review and comment before final local action (similar to the FAA referrals under FAR Part 150). "Major" development around the



airport may be defined, for example, as one or more “conditional” uses shown in the local government’s airport zoning ordinance’s summary compatible use table. (Conditional uses are designated for further scrutiny and often a public hearing.)

Similarly, while an airport zoning ordinance on its face may offer protection, its effectiveness can be eroded steadily by unwarranted variances. To reduce the granting of such variances and to assure thorough local understanding of a variance request’s likely effects on airport operations, local agencies may choose to refer some or all variance applications to Mn/DOT for review and comment before a final local decision.

***Modernize and Expand the List of Incompatible and Compatible Uses in Local Airport Zoning Ordinances***

BP

The current list of appropriate and prohibited uses contained in the Minnesota model airport ordinance is out-of-date and incomplete. Few Minnesota jurisdictions, however, have stepped beyond the model to expand and clarify the scope of compatible and incompatible uses. Accordingly, local Minnesota governments are encouraged to revise their airport zoning standards to adopt a more detailed and clear list of allowed and prohibited uses near airports. The revised Minnesota model airport zoning ordinance contained in Chapter 6 of this manual includes a new compatible land use list, which local governments are encouraged to consider utilizing.

***Consider Regulating Incompatible Land Uses in Safety Zone C***

BP

As part of the research for this manual, Mn/DOT examined other states’ approaches to regulating land uses around public airports to prevent safety hazards. Several other states, such as Florida, Oregon, Washington and California, which have devoted considerable resources to studying safety compatibility issues at airports, all have recommended or mandated regulation of land uses and population densities in areas overlapping with Minnesota’s Safety Zone C. In California, most notably, this directive was based on close examination of NTSB accident data and detailed third-party risk analysis. In recent years, the United States military has also recommended similar land use and density restrictions around its air bases.

Although an independent accident and risk analysis was not part of this effort, Mn/DOT believes its review of other states’ analysis and research suggests there are valid safety compatibility concerns in land areas corresponding to Safety Zone C. In addition, providing additional “breathing room” or buffer in Safety Zone C may be good practice for many airports expecting future growth and possible expansion. Accordingly, Mn/DOT suggests local governments consider these issues in future updates to their airport zoning ordinances. Please refer to Chapter 3 of this manual for a more detailed discussion of incompatible airport land uses and other states’ regulatory approaches.



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