

# LA CROSSE MUNICIPAL AIRPORT AIRPORT LAND USE PLAN





ADOPTED JANUARY 13, 2011

# Chapter 1

# Introduction

## 1.1 Overview of the Plan

This document provides guidance for the implementation of the La Crosse Municipal Airport zoning ordinance. The *La Crosse Municipal Airport Land Use Plan* (ALUP) is intended to be used in conjunction with the La Crosse Comprehensive Plan (titled *Confluence: The La Crosse*) *Comprehensive* Plan) with regards to land use. The ALUP and related zoning ordinance were developed in accordance with the *Wisconsin Airport Land Use Guidebook* and appropriate State of Wisconsin enabling legislation, standards, and policies. This plan is intended to assist local planning and zoning administrators with the implementation and enforcement of the *Airport Zoning Ordinance* (AZO) and should be utilized in conjunction with the Master Plan for the La Crosse Municipal Airport (LSE), herein referred to as Airport.

The ALUP includes several sections that contain guidance related to the evaluation and implementation of the plan. The specific chapters include:

- Chapter 1 Introduction
- Chapter 2 Land Use Compatibility
- Chapter 3 Airport Overlay Zones
- Chapter 4 Implementation
- Appendices

This section of the ALUP contains information that provides the basis for the development of the Plan and Ordinance.

## 1.2 Purpose

The ALUP and AZO were prepared to:

- Assist in the preservation, continued development, and expansion of the Airport consistent with the *Wisconsin Airport Land Use Guidebook*.
- Protect the public health, safety, and welfare by identifying land use measures to be implemented in order to minimize the public's exposure to excessive noise and safety hazards within a three (3)-mile jurisdictional area surrounding the Airport.
- Protect the long-term economic viability of the Airport by establishing compatible land uses within the Airport's environs.
- Promote the safety and well-being of the public through the adoption of land use regulations, which minimize exposure to hazards associated with Airport operations.
- Provide an ordinance and criteria to assist surrounding municipalities, including the City of La Crosse, City of La Crescent, Town of La Crescent, Town of Campbell, Village of Holmen, City of Onalaska, Town of Onalaska, Town of Dresbach, and Town of Medary,

in evaluating the compatibility of existing and proposed land uses in proximity to the Airport.

- Provide guidance to persons presenting proposed local actions or developments that may impact the Airport.
- Protect the public's investment and interest in the continuing operation of the Airport.

# 1.3 Importance of Land Use Compatibility

Airport-compatible land uses are typically defined as uses that can coexist with a nearby airport without either constraining the safe and efficient operation of the airport or exposing people living or working nearby to unacceptable levels of noise or hazards. It is essential to promote and maintain those uses fitting this definition of compatibility to protect the safety of persons in the air and on the ground in proximity to the Airport.

While this definition does not identify specific compatible land uses, it does so for a reason. To determine the compatibility of a specific land use, several variables need to be considered, including:

- Management of the land use
- Location of the land use relative to the Airport and the approach areas
- Attributes of development
- Ancillary types of impacts associated with the land use

Types of land use generally considered to be compatible (such as commercial, industrial, and agricultural) may not be compatible based on the above considerations. Each type of land use must be evaluated in detail as it relates to individual communities, as even those considered compatible can have instances where incompatibility can arise. Conversely, some incompatible uses can be considered compatible if managed properly. Consequently, use of this plan is suggested to address the specific needs of the greater La Crosse area and the Airport.

The Wisconsin Department of Transportation (DOT) Bureau of Aeronautics has recognized the need to preserve and maintain safe, quality facilities and services as identified in the *Wisconsin State Airport System Plan 2020* and the *Wisconsin Airport Land Use Guidebook*. **Table 1-1** illustrates the anticipated growth of aviation activity, which includes the total number of annual aircraft operations and based aircraft, in Wisconsin over the next 10 years.

#### Table 1-1 Statewide Aviation Demand in Wisconsin

| 2010        | 2020                 |
|-------------|----------------------|
| 2.5 million | 2.7 million          |
| 4,092       | 4,298                |
|             | 2.5 million<br>4,092 |

Source: Wisconsin State Airport System Plan 2020

Aviation activity is forecasted to increase in Wisconsin. Consequently, it is critical to preserve aviation facilities because federal, state, and local resources have been invested to develop the airport infrastructure that is necessary to support growth. Compatible land use planning can protect the navigable airspace and ground area around an airport and attempt to maximize the return on investment in infrastructure, as well as maintain a safe operating environment.

Comparing the Airport to the state forecasts, it appears there has been a decline in overall operations. However, an increase in operations is forecasted, as illustrated in **Table 1-2**. This decline is not unusual for an airport such as LSE; in fact, many airports of similar type have also experienced operational declines in the past several years due to economic pressures and airline cut backs/restructuring.

La Crosse has recognized this trend and has initiated efforts to preserve Airport operations and attract new business. The ability of La Crosse to attract new industries and retain existing industries illustrates the need to preserve and maintain the Airport to support future growth and development in the surrounding municipalities. Aviation becomes increasingly important to states, counties, and cities as pressure mounts to attract viable industry, provide stable economic conditions, and appeal to additional residents and businesses for the provision of transportation needs.

|                     | 2004*  | 2010** | 2020** |
|---------------------|--------|--------|--------|
| Aircraft Operations | 44,000 | 25,576 | 29,917 |
| Based Aircraft      | 88     | 93     | 108    |

### Table 1-2 La Crosse Municipal Airport Forecast of Aviation Demand

Source: \*La Crosse Municipal Airport Economic Impact Study, 2005 \*\*FAA Terminal Area Forecast (TAF) Forecast, December 2009

# 1.4 La Crosse Municipal Airport Facility Information

The Airport is located in the French Island district of the City of La Crosse. It lies on French Island, bordering the City of Onalaska to the east and La Crescent to the southwest. At an elevation of 655 feet above mean sea level (MSL), the Airport encompasses 1,380 acres of property.

The three (3)-mile jurisdictional boundary around the Airport, as identified in the State of Wisconsin enabling legislation and outlined in white in **Figure 1-1**, encompasses nine (9) municipalities. The municipalities are outlined in **Figure 1-1** and include the City of La Crosse, City of La Crescent, Town of La Crescent, Town of Campbell, Village of Holmen, City of Onalaska, Town of Onalaska, Town of Dresbach, and Town of Medary.



Figure 1-1 Municipalities Surrounding La Crosse Municipal Airport

Source: City of La Crosse GIS adapted by Mead & Hunt, Inc.

The Airport is owned and operated by the City of La Crosse. Located along the Mississippi River in the west-central region of Wisconsin, the Airport provides service to individuals living in Wisconsin, as well as south-eastern Minnesota and north-eastern Iowa. The Airport's location in relation to the surrounding regions is shown in **Figure 1-2**.



Figure 1-2 La Crosse Municipal Airport Regional Location

Source: La Crosse County Comprehensive Plan 2007-2027 adapted by Mead & Hunt

Maintaining the current Airport infrastructure and protecting the Airport from the encroachment of incompatible land use enhances the ability of the Airport to provide vital economic support for the continued growth and development of the surrounding communities. **Figure 1-3** illustrates the Airport's location in relation to the surrounding communities.



Figure 1-3 La Crosse Municipal Airport Local Location

Source: La Crosse County Comprehensive Plan 2007-2027 adapted by Mead & Hunt

The Wisconsin State Airport System Plan 2020 classifies the Airport as an Air Carrier/Cargo (AC/C) airport. According to the Federal Aviation Administration's (FAA) National Plan of Integrated Airport Systems (NPIAS), the Airport is classified as a Primary Commercial Service airport. The Airport can accommodate all types of air carrier services. LSE provides commercial service on both Delta and American Airlines, with 12 flights daily as of summer 2010.

The FAA Airport Master Record (Form 5010-1) identifies three (3) runways at the Airport. Pertinent runway information and FAA Federal Aviation Regulation (FAR) Part 77 classifications are depicted in **Table 1-3**. Knowing the specific runway length and associated FAR Part 77

Surface info is important because it provides the foundation upon which the FAA evaluates compatibility.

| Runways   | Runway Length<br>(feet)   | Runway Width<br>(feet)                       | FAR Part 77<br>Classifications |  |  |  |  |  |
|---|---|--|--------------------------------|--|--|--|--|--|
| 03<br>21  | - 5,199   | 150  | B(V)<br>B(V)                   |  |  |  |  |  |
| 13<br>31  | 6,050   | 150  | C<br>B(V)                      |  |  |  |  |  |
| 18<br>36  | <u>18</u> 8,742 150   |  |                                |  |  |  |  |  |
| C – <u>Non-precision Appr</u><br>B(V) – <u>Visual Approach</u><br>PIR – <u>Precision instrumen</u><br>Instrument Landing System | <u>oach</u><br><u>It runway - </u> The runway has an<br>n (ILS) or a Precision Approach | existing instrument approach<br>Radar (PAR). | procedure that utilizes an     |  |  |  |  |  |

#### Table 1-3 Existing La Crosse Municipal Airport Runway Information

Source: FAR Part 77 Object Affecting Navigable Airspace

See Appendix A for specific dimensional standards for the FAR Part 77 Surfaces.

## 1.5 Future Airport Approach Considerations

As technology advances continue to appear in the aviation industry, it is expected that changes to runway approaches may occur. In the past, approaches that provide precision navigation to runway ends were often provided by physical equipment based at an airport (e.g. Instrument Landing Systems [ILSs]). With new satellite-based technology, global positioning systems (GPS) approaches are being utilized by the FAA to provide approaches to runways without any ground-based equipment needs. All of the navigational support is provided by satellites and equipment in the cockpit of the aircraft. This allows a new freedom to provide more precise approaches to runways that have not had them previously.

In an attempt to protect the airspace necessary for these new approaches, the Airport plans to consider development of precision GPS approaches on the end of each existing runway. As such, the larger FAR Part 77 Classification, PIR, is being considered as part of this study for inclusion in the land use planning assessment for each runway end. Chapter 3 of this report will expand upon these issues and Appendix A presents additional information about FAR Part 77 Classifications.

## 1.6 Assessment of La Crosse

In 1999 the State of Wisconsin mandated that all municipalities are to develop and adopt Comprehensive Plans by 2010 to guide planning and development for the next 25 years. The City of La Crosse developed a Comprehensive Plan titled *Confluence: The La Crosse Comprehensive Plan*, which includes an objective to "Maintain and improve passenger and freight air service while minimizing impacts to surrounding neighborhoods."

The census numbers in **Table 1-4** were taken from the *La Crosse County Comprehensive Plan* and indicate that the majority of municipalities, particularly some of those located near the Airport, are expected to experience a steady increase in population growth over the next 15 years. This growth warrants vital consideration of land use compatibility issues in the vicinity of the Airport to minimize impacts to the Airport and surrounding neighborhoods.

| Census              |        |        |         | Projections |         |         |         |
|---------------------|--------|--------|---------|-------------|---------|---------|---------|
| Municipality        | 1980   | 1990   | 2000    | 2010        | 2015    | 2020    | 2025    |
| Town of Burns       | 988    | 977    | 979     | 990         | 989     | 993     | 1,007   |
| Town of             |        |        |         |             |         |         |         |
| Farmington          | 1,603  | 1,577  | 1,733   | 1,903       | 1,975   | 2,052   | 2,153   |
| Village of Bangor   | 1,012  | 1,076  | 1,400   | 1,544       | 1,606   | 1,672   | 1,757   |
| Village of Rockland | 383    | 509    | 625     | 712         | 750     | 790     | 839     |
| Town of Bangor      | 572    | 598    | 583     | 599         | 603     | 610     | 623     |
| Town of Greenfield  | 1,537  | 1,617  | 1,538   | 1,583       | 1,596   | 1,614   | 1,651   |
| Town of             |        |        |         |             |         |         |         |
| Washington          | 611    | 598    | 738     | 804         | 831     | 861     | 901     |
| Town of Barre       | 901    | 909    | 1,014   | 1,108       | 1,148   | 1,191   | 1,248   |
| Town of Hamilton    | 1,472  | 1,633  | 2,103   | 2,477       | 2,646   | 2,821   | 3,028   |
| Village of West     |        |        |         |             |         |         |         |
| Salem               | 3,276  | 3,611  | 4,738   | 5,399       | 5,691   | 5,998   | 6,372   |
| Town of Holland     | 1,776  | 2,175  | 3,042   | 3,609       | 3,867   | 4,134   | 4,447   |
| Town of Onalaska    | 5,386  | 5,803  | 5,210   | 5,668       | 5,860   | 6,071   | 6,349   |
| Village of Holmen   | 2,400  | 3,236  | 6,200   | 7,633       | 8,287   | 8,958   | 9,729   |
| Town of Campbell    | 4,118  | 4,490  | 4,410   | 4,478       | 4,486   | 4,511   | 4,587   |
| Town of Medary      | 1,794  | 1,539  | 1,463   | 1,519       | 1,538   | 1,562   | 1,604   |
| Town of Shelby      | 5,620  | 5,002  | 4,687   | 4,655       | 4,613   | 4,589   | 4,617   |
| City of La Crosse   | 48,347 | 51,140 | 51,818  | 51,507      | 51,059  | 50,810  | 51,141  |
| City of Onalaska    | 9,249  | 11,414 | 14,839  | 17,023      | 17,993  | 19,009  | 20,238  |
| County Total        | 91,056 | 97,904 | 107,120 | 113,211     | 115,538 | 118,246 | 122,291 |

Table 1-4 La Crosse County Population Data 1980-2025

Source: U.S. Bureau of the Census, 2000

La Crosse County Comprehensive Plan 2007-2027

State of Wisconsin Department of Administration (DOA)

**Figure 1-4** illustrates the percentage of population growth in communities surrounding the Airport forecasted from the year 1980 through 2025. La Crosse County is projected to see an estimated increase of 31,235 residents during that time period, or roughly 34 percent. This projected growth demonstrates a greater demand for future housing options, employment opportunities, and economic developments in La Crosse County, and therefore, an increased need for developable land. As developers search for land to support population growth in the surrounding communities, the potential for incompatible development near the Airport increases. Land use

guidelines must be established beforehand to adequately safeguard the Airport and surrounding communities from potential incompatible growth.





# 1.7 Summary

The City of La Crosse has made a concerted effort to address land use compatibility issues surrounding the Airport through the development of this ALUP and the AZO. Preservation of the Airport and its facilities is essential to the economy and the quality of life for the residents of La Crosse and the surrounding communities. Through the due diligence of the these various municipalities, lead by the City of La Crosse as owners of the Airport, this unified land use plan and zoning ordinance can protect and allow for the preservation of the Airport and promote compatible growth and development within these municipalities.

Source: U.S. Bureau of the Census, 2000 La Crosse County Comprehensive Plan 2007-2027

# Chapter 2

# Land Use Compatibility

# 2.1 Overview of Land Use Compatibility Issues

This Chapter summarizes land uses that are acknowledged to present compatibility concerns for airports and the surrounding communities. Land use compatibility near airports is composed of two elements: the concerns associated with compatibility, and the type of land use considered. These elements help determine the level of compatibility a certain land use has with its surrounding environs. While general types of land uses are typically considered compatible or incompatible, it is important to evaluate each use independently since certain factors can change how a land use is viewed. It is for this reason that land uses surrounding the Airport should be given individual consideration for compatibility with airport operations.

# 2.2 Primary Areas of Interest

To determine the compatibility of a particular land use, two elements are considered. The first element includes the types of compatibility concerns that affect the relationship between the Airport and its surrounding communities; the second element includes the type of land use considered (see Section 2.3). Compatibility concerns include any airport impact that adversely affects the livability of surrounding communities, as well as any community characteristic that can adversely affect the viability of the Airport. These concerns are generally classified as related to either noise or safety, and are discussed in further detail below.

#### 2.2.a. Noise Sensitivity Related Issues

When addressing compatible land use, aircraft noise is often a primary concern. At times noise is considered the key factor affecting or limiting airport operations, since it is most often noticed by individuals living near an airport. Aircraft operations can create sound levels that produce annoyance in communities near airports, as well as affect speech, sleep, and classroom learning. These annoyances are of concern as they impact the quality of life for residents located in proximity to an airport.

Several factors can affect the level of impact that aircraft noise can have near an airport. Some of these factors include:

- Number of aircraft operations
- Type of air service (commercial versus general aviation)
- Type of aircraft using the Airport (single engine aircraft versus jet aircraft)
- Airfield layout
- Location of the Airport relative to surrounding development
- Time of day
- Percentage of time each runway or runway direction is used

Several other factors can determine a community's response to noise, including:

- Type of surrounding land use (commercial, industrial, etc.) and the noise level it produces
- Type of surrounding environment (rural, suburban, or urban) and its ambient noise level
- Configuration of surrounding land use
- Noise sensitivity of surrounding land uses
- Past experience of the community to noise exposure
- Perceptions as to the necessity of the noise

Challenges associated with noise-related issues stem from the difference between FAA noise standards and a property owner's perception of aircraft noise. The FAA and the U.S. Department of Housing and Urban Development (HUD) have defined limits for noise impacts that are based on specific exposure to noise levels. The FAA and HUD use a unit of measurement called the Day-Night Level (DNL) to measure aircraft noise. A DNL of 65 decibels (dB) or greater indicates a level of impact that can alter a person's quality of life. Unfortunately, property owners in proximity to the Airport are still exposed to aircraft noise levels that they may perceive as an interruption to their daily lives. To better understand a 65 DNL exposure, **Figure 2-1** illustrates some common indoor and outdoor noise levels associated with particular activities.

**Figure 2-2** illustrates the La Crosse Municipal Airport Noise Contour Map, which depicts the geographic areas impacted by the DNL contours in 2000 during normal operations. **Figure 2-3** illustrates the projected normal operation contours for 2020. The aircraft noise contours are defined using the FAA's Integrated Noise Model (INM). The INM contains a database that relates noise levels to each specific type of aircraft. On a three (3)-dimensional grid around the Airport, the INM computes the noise exposure level for a specific aircraft and engine thrust used at a particular point along the flight track of an aircraft.

Noise levels are then indicated by a series of contour lines superimposed on a map of the Airport and the surrounding communities. Although lines on a map tend to be viewed as definitive, it should be emphasized that the INM is *only* a planning tool. The La Crosse Planning Department and surrounding municipal planners can use the noise contours to identify areas around the Airport that are likely to be impacted by aircraft noise, thus allowing the municipalities to site airport compatible land uses within the identified noise impact areas.

| Common Outdoor<br>Sound Levels                     | 5   | Soun | d | Common Indoor<br>Sound Levels   |
|--|-----|------|---|---------------------------------|
| Concorde, Landing 1000 m. from Runway End          |     | 110  | Г | Rock Band                       |
| 727-100 6500 m. from Start of Takeoff Roll         |     | 100  | ╞ | Inside Subway Train (New York)  |
| 747-200 6500 m. from Start of Takeoff              |     | 90   | Ļ | Food Blender at 3 ft.           |
| Diesel Truck at 50 ft./Lear 25D 2000 m. from Landi | ng  |      |   |                                 |
| Lear 35 2000 m. from Landing                       |     |      |   | Garbage Disposal at 3 ft.       |
| Lear 25D 6500 m. from Start of Takeoff             |     | 80   | Γ | Shouting at 3 ft.               |
| ear 35 6500 m. from Start of Takeoff               |     |      |   |                                 |
|  |     | 70   | F | Vacuum Cleaner at 10 ft.        |
|  |     |      |   | Normal Speech at 3 ft           |
| Commercial Area                                    | 332 |      |   | Normal operations               |
| Cessna 172 1000 m. nom Landing                     |     | 60   | Γ |                                 |
|  |     |      |   | Large Business Office           |
| Quiet Urban Daytime                                | -   | 50   | F | Dishwasher Next Room            |
|  |     |      |   |                                 |
| Quiet Urban Nighttime                              | _   | 40   | L | Small Theater, Large Conference |
|  |     | 40   |   | (Background)                    |
| Quiet Suburban Nighttime                           |     |      |   | Library                         |
|  | -   | 30   | F |                                 |
|  |     |      |   | Bedroom at night                |
| Quiet Rural Nighttime                              |     |      |   | Concert Hall (Background)       |
|  | -   | 20   | F |                                 |
|  |     |      |   | Broadcast & Recording Studio    |
|  | _   | 10   | F |                                 |
|  |     |      |   | Threshold of Uppring            |
|  |     |      |   | Threshold of Hearing            |
|  | _   | 0    |   |                                 |

Figure 2-1 Comparison of Common Sound Levels

Source: Federal Interagency Committee on Aviation Noise (FICAN)



Figure 2-2 La Crosse Municipal Airport Noise Exposure Map - 2000



Figure 2-3 La Crosse Municipal Airport Projected Noise Exposure Map - 2020

The FAA provides guidance, as noted below, for the development of Noise Compatibility Plans for areas affected by aircraft noise in several FARs.

- FAR Part 36, Noise Standards: Aircraft Type and Airworthiness Certification
- FAR Part 91 Subpart I, Operating Noise Limits
- FAR Part 150, Airport Noise Compatibility Planning
- FAR Part 161, Notice and Approval of Airport Noise and Access Restrictions

The primary resource for noise-related issues is FAR Part 150, *Airport Noise Compatibility Planning.* FAR Part 150 describes acceptable types of land uses for each DNL noise level. For example, residential developments should not be allowed in areas exposed to 65 DNL or greater. In addition, if a noise-sensitive facility is developed within the 65 DNL, the FAA recommends construction that utilizes noise level reduction techniques.

The basic approach to enhance noise compatibility is to minimize the extent to which noise disrupts human activities or otherwise creates an annoyance. In general, the best approach is to allow fewer people to occupy high-noise impacted areas. When this approach is not practical, alternatives include:

- Shielding people from noise
- Increasing awareness of noise issues through educational programs
- Allowing land uses that have relatively high ambient noise levels or are otherwise not particularly noise sensitive

#### 2.2.b. Safety-Related Issues

Safety concerns are arguably the toughest to address since they deal with what *might* happen, whereas noise concerns deal with what *does* happen. Maintaining the safety of aircraft and their occupants while in the air and on the ground, as well as the safety of persons on the ground located in proximity to the Airport, is vital. Safety concerns regarding land use can be divided into two broad categories: those that can be hazardous to airspace and overflight, and those that affect accident severity. Each characteristic is discussed in detail in the following pages:

- o Land Use Characteristics that Can be Hazardous to Airspace and Overflight
  - Tall Structures
  - Visual Obstructions and Electronic Interference
  - Wildlife and Bird Attractants
- o Land Use Characteristics that Affect Accident Severity
  - High Concentrations of People
  - High Risk-Sensitive Uses

#### Land Use Characteristics that can be Hazardous to Airspace and Overflight

#### Tall Structures

It is critical to avoid tall structures within the approach and departure surfaces of an airport, as described in FAR Part 77. Low-level flight occurs on or near an airport during approach and departure, as well as during flights such as crop dusting and search-and-rescue operations. Inadvertent collisions with tall structures during any stage of flight are detrimental to the safety and welfare of those in the aircraft and those on the ground. Tall structures include buildings, objects, and natural vegetative growth such as trees. Tall objects adversely affect approach corridors and instrument approach altitudes. Therefore, the siting of tall objects such as multi-story structures, power lines, wind farms, and telecommunication towers, or allowing trees to grow to substantial heights near airport traffic patterns and flight paths, should be discouraged (see **Figure 2-4** and **Figure 2-5**). The risk to aircraft safety associated with tall structures can be minimized if structures are clearly marked with lighting and if the airport issues a Notice to Airmen (NOTAM) to pilots.

Figure 2-4 Tall Structures - Wind Farms.







Sources: www.istockphoto.com

Per FAA AC 70/7460-1K Change 2, *Obstruction Marking and Lighting*, when a sponsor proposes any type of construction or alteration of a structure that may affect the National Airspace System (NAS), the sponsor is required to submit FAA Form 7460-1, *Notice of Proposed Construction or Alteration* to the Obstruction Evaluation Service (OES).

FAA Form 7460-1 is required for any proposed construction or alteration:

- o Of more than 200 feet above the ground level at its site and/or;
- o Of greater height than an imaginary surface at a slope of 100 horizontal for every one foot vertical (100:1) for a horizontal distance of 20,000 feet from the nearest point of the nearest runway.

If required, the FAA will include FAA Form 7460-2, *Notice of Actual Construction or Alteration*, with a determination. Form 7460-1 and 7460-2 are required at all federally obligated airports to assess each proposed or temporary construction in the vicinity of the airport, typically within three (3) to five (5) miles. The FAA evaluates the forms based on the FAR Part 77 provisions, which require that an aeronautical study be conducted to determine whether or not a proposed construction project would pose a hazard to navigable airspace.

It is imperative that local planners and decision makers are aware of these critical safety considerations when developing around the Airport. The City of La Crosse, along with the surrounding municipalities, can establish and enforce height restrictions that extend beyond the basic FAA standards. However, approval should be withheld until comments from the FAA and any state level agency are received. The FAA determination and opinion do not override the local governing authority, should the local ordinance be more restrictive.

#### Visual Obstructions and Electronic Interference

Although not a physical obstruction in the same sense that tall structures are, visual obstructions also pose hazards to flight by reducing pilot visibility. Many aircraft operations occur without navigational aids; therefore, clear visibility in the area surrounding the Airport is vital. Land uses that obscure pilot visibility should be limited to ensure safe air navigation. Visibility can be obscured by dust, glare, light emissions, smoke, steam, and smog. Consequently, each of these should be managed when feasible to limit adverse impacts.

Dust and dust storms carry sand particles through the air that can create hazardous conditions due to severe reduction in visibility (see Figure 2-6). When construction or farming activities occur within the vicinity of an airport, a risk exists for exposed earth materials to be carried by high winds across airport operational areas. Areas where low-level flight altitudes occur are susceptible to dust storms during approach and departure. Caution should be exercised to minimize earth disturbance and the creation of open dirt areas that can contribute to these issues.



Figure 2-6 Example of Reduced Visibility - Dust

Source: www.istockphoto.com

Glare produced from reflective surfaces can blind or distract pilots during low-level flight altitudes. Water surfaces such as storm water detention ponds and light-colored or mirrored building materials can also produce glare (see Figure 2-7). It is important to evaluate these items during site plan review and to consider whether or not they may impact a pilot's vision. Measures should be taken to minimize the use of reflective materials in proximity to the Airport.



Figure 2-7 Glare from Building Materials

Source: www.istockphoto.com

Light emissions are often caused by lights that shine upward in a flight path. A pilot's ability to identify an airport during low-level flight altitudes can be hindered by emissions during evening hours (see Figure 2-8), storm events, or times of

reduced visibility such as fog. Also, flashing lights or lights arranged in a linear pattern can be mistaken for airport lights denoting operational areas. Bright lights can be distracting and cause a blurred or momentary loss of vision for pilots as they pass from darkness into well-lit areas. For these reasons, efforts should be made to require down-shielded lighting fixtures as well as minimize linear lighting patterns near the Airport.



Figure 2-8 Nighttime Light Emissions

Source: www.istockphoto.com

Smoke, steam, and smog can create a hazardous haze that contributes to reduced visibility for a pilot while operating an aircraft (see Figure 2-9). Generation of these conditions by land uses such as manufacturing and ethanol plants, or utilities such as electrical generation and nuclear power plants, can pose a problem for pilots. Furthermore, thermal plumes created by these types of facilities can cause air turbulence that could be hazardous to aircraft, even though they are not visible to pilots. The location of these types of land uses relative to an airport's operational areas should be carefully considered.

#### Figure 2-9 Steam Emissions



Source: www.istockphoto.com

#### Wildlife and Bird Attractants

Aircraft collisions with wildlife are a threat to human health and safety. Wildlife strikes killed 194 people and destroyed 163 aircraft according to the *FAA Wildlife Strikes to Civil Aircraft in the United States 1990-2005*. Since 1990, 82,057 wildlife strikes have been reported to the FAA; 97.5% involved birds (see **Figure 2-10**), 2.1% involved terrestrial mammals, 0.3% involved bats, and 0.1% involved reptiles. The number of strikes reported annually has quadrupled since 1990 resulting from an increase in the number of aircraft operations, as well as populations of hazardous wildlife species.



Figure 2-10 Example of Wildlife Hazards

Source: www.istockphoto.com

Monitoring wildlife activity and habitats on or near an airport is an important step to determine how to protect the airport from wildlife hazards. Development and implementation of a wildlife management plan also plays a critical role in airport planning and zoning by giving the airport the tools and techniques to properly maintain habitat management controls. FAA Advisory Circular (AC) 150/5200-33A, *Hazardous Wildlife Attractants on or Near Airports*, discusses various incompatible land uses and bird attractants.

**Figure 2-11** illustrates the areas where wildlife attractants are not allowed on or near airport property. Guidelines urge airport sponsors to discourage the creation of pools, ponds, sewage lagoons, and fountains on or near an airport. Permanent water sources should be managed by removal, physical exclusion, or alteration of appearance. Successful retention/detention designs include temporary holding basins that drain within 24 hours and underground facilities such as French drains or buried rock fields. If drains and ditches cannot be removed, the banks should be mowed regularly to control bird nesting and perching.



Figure 2-11 Separation Distances within which Hazardous Wildlife Attractants should be Avoided, Eliminated, or Mitigated

PERIMETER A: For airports serving piston-powered aircraft, hazardous wildlife attractants must be 5,000 feet from the nearest air operations area.

PERIMETER B: For airports serving turbine-powered aircraft, hazardous wildlife attractants must be 10,000 feet from the nearest air operations area.

PERIMETER C: 5-mile range to protect approach, departure and circling airspace.

Source: Graphic Developed by FAA Central Region Airports Division based upon guidance in FAA AC 150/5200-33B, Hazardous Wildlife Attractants on or Near Airports.

Control techniques to manage wildlife hazards or bird attractants include physical removal of wildlife, fence installation, and maintenance of airport grounds in such a manner that deters wildlife habitation. Habitat management controls include:

- Select and space tree species to minimize habitats
- o Maintain appropriate grass lengths to minimize wildlife attractants
- o Prohibit certain agricultural crops near an airport
- o Eliminate standing water
- Use repellents to disperse wildlife in a humane manner

The United States Department of Agriculture (USDA) provides a listing of plants that are attractive to wildlife and should be avoided on or near airports, such as fruit or seed bearing plants (e.g. crab apple, holly, blueberry, juniper, and sunflower). Woody plants such as oak, fir, pine, maple, and cedar should be avoided, as they provide roosting habitats. Additionally, upland weeds and shrubs should be discouraged near an airport as they provide a food source and habitat for wildlife. Marsh plants such as water lily, wild celery, and wild rice can also provide a food source for a variety of wildlife and should also be discouraged from use. Cultivated or ornamental plants such as birch trees and dogwoods provide food sources and some habitat options as well. The USDA bulletin, *Plants Attractive to Wildlife,* also lists the following crops and vegetation which should be avoided in the vicinity of the Airport's environs:

- Alfalfa
- Barley
- Corn
- Oats
- Sorghum
- Wheat
- Vineyards
- Apple trees
- Cherry trees

The management of potentially hazardous wildlife on or near an airport proves to be challenging because it typically combines active control measures such as repellents with passive control measures such as preventing and eliminating refuges and controlling attractants. Another key component to implement these short- and long-term control measures is to accurately monitor and record wildlife obstructions and control wildlife activity on and near airports. It is important to report all bird and wildlife strikes to the FAA to support the study of wildlife management. In addition to AC 150/5200-33A, the FAA has published a manual titled *Wildlife Hazard Management at Airports* to serve as a reference for wildlife issues within proximity to airports.

The FAA and the USDA Animal and Plant Health Inspection Services (APHIS) Wildlife Services (WS) have signed a Memorandum of Understanding (MOU) to resolve wildlife hazards to aviation to enhance public safety. The MOU establishes that the USDA APHIS WS has the expertise to provide technical and operational assistance to alleviate wildlife hazards at airports. The *Rural Development, Agriculture, and Related Agencies Appropriations Act of 1988* authorizes and directs the Secretary of Agriculture to cooperate with states, individuals, public and private agencies, organizations, and institutions in the control of nuisance mammals and birds deemed harmful to the public. The Airport entered into a cooperative agreement with the USDA APHIS WS for the completion of a wildlife hazard assessment with recommended mitigation efforts. This assessment was completed in May 2001, and recommendations were incorporated into the existing Airport Certification Manual, Wildlife Hazard Management Plan.

US Code of Federal Regulations Title 14 Aeronautics and Space Part 139 Certification of Airports, Subpart D 139.337 *Wildlife Hazard Management* requires the airport sponsor take action to eliminate wildlife hazards on or near the airport environs. While aviation safety is of paramount concern, it is recognized that the elimination of all wildlife hazards to aviation is not possible and that not all wildlife are equally hazardous to aviation. Guidelines and assistance provided by the USDA APHIS WS can be followed in order to effectively analyze the comparative threats by wildlife.

#### Land Use Characteristics that Affect Accident Severity

#### High Concentrations of People

Concentrations of people, or density, can be defined as the number of people within a particular land area. Density is measured by the number of people per unit of area and is often categorized as high, medium, or low depending on the number of people a development contains. Available accident data suggests that the greatest percentage of aircraft accidents occur near runway ends during approach and departure. The risk of damage and personal injury to both people on the ground and in the aircraft can be reduced significantly by limiting the number of people in areas adjacent to the Airport, particularly near runway ends.



Figure 2-12 High Concentrations of People

Source: www.istockphoto.com

Density can vary depending on the particular needs of the associated communities and the type of aircraft utilizing the airport. The degree of risk associated with density and the probability of aircraft accidents vary among communities and is generally based upon such factors as type of airport, number of operations, and type of surrounding land uses.

Therefore, determining an appropriate density within the vicinity of the airport can be a challenge.

The following methods may assist in determining the appropriate density levels near the Airport:

- o Analysis of parking requirements established in local zoning ordinances
- o Maximum occupancy level set in accordance with building codes
- o Residential density measured in the number of dwelling units per acre (du/ac)
  - Low density
  - Medium density
  - High density
- o Urban density measured with an acceptable floor-area ratio
- Surveys of similar uses

It is important to also consider the frequency of use. A facility that is occupied occasionally and vacant otherwise may be allowed to have a higher concentration of people than would be permitted for a more frequently used facility. However, in general, the higher the concentration of people that a land use supports or attracts (see **Figure 2-12**), the less compatible it will be in proximity to the Airport. The lower the concentration of people, the more compatible the land uses will be near the Airport.

#### High Risk-Sensitive Uses

Beyond density, critical types of land use pose high risks and should be avoided near the ends of runways regardless of the number of people on the site. Chief among these uses are those in which the mobility of occupants is effectively limited, such as schools (see **Figure 2-13**), hospitals, and nursing homes. Other uses classified as critical community infrastructure, such as power plants, electrical substations, and public communications facilities, should also be avoided as the damage or destruction of these could cause significant adverse effects to public health and welfare beyond the immediate vicinity of the facility. Furthermore, the aboveground storage of large quantities of materials that are hazardous, such as flammable, explosive, corrosive, or toxic materials, should also be avoided as the josive in an aircraft accident.



#### Figure 2-13 Example of a High Risk-Sensitive Use – An Elementary School

Source: www.google.com

#### Open Land

A final characteristic that can affect the severity of an aircraft accident is open land. Open land serves two functions: it generally has few occupants, thus limiting the number of people placed in harm's way; and it can potentially enhance the survivability for the occupants of an aircraft forced to make an emergency landing away from a runway. If sufficiently large and clear of obstacles, open land areas can be valuable for light aircraft anywhere near an airport. For large and high-performance aircraft, however, open land has little value for emergency landing purposes and is most useful primarily where it is an extension of the clear areas immediately adjoining a runway.

Because open land areas must be relatively large (football field size or greater) even for small aircraft, planning for such areas must be made during preparation of community plans or plans for large developments. By the time a development has proceeded to the point where it is split into individual parcels, providing open land is seldom possible. Also important to emphasize is that "open land" differs from "open space." As the latter term is typically used in community planning, it may include wooded areas, sports parks, and other land uses that would not meet the aviation purposes of open land. On the other hand, farm fields and even wide roadways may serve as open land but not show as open space in local plans.

#### 2.3 Land Use Classifications

The second element of land use compatibility includes the type of land use considered. As part of the local planning effort, definitions of various land uses are developed to address specific needs. Since the specific classifications can vary by community, the definitions in this section have been kept broad to allow flexibility in interpretation and implementation by local planners and elected officials. Land use classifications are separated into the following categories:

- Residential
- Commercial (shopping, business, or trade activities)

- Industrial/Manufacturing (industrial, manufacturing, and waste activities)
- Institutional (social and institutional activities)
- Infrastructure (special uses and infrastructure activities)
- Agricultural and Open Space (natural resource activities)
- Parks and Recreation (leisure activities)

Tables within this section contain examples of development associated with each land use classification and suggest areas of potential noise or safety concerns.

The intent of this section is to provide a brief summary of the various types of land uses that may be found near the Airport, and the various concerns associated with the primary areas of interest. The information is not meant to be a definitive list of specific land use classifications that are considered to be compatible or incompatible with the Airport environs. Instead, it is designed to provide a general assessment tool to be used by elected officials, planning commissions, developers, and planners when evaluating the compatibility between a potential development and airport property.

#### 2.3.a. Residential Activities

As urban population continues to rise, residential land use development often encroaches upon what was once open space surrounding airport property. Encroachment jeopardizes public safety and airport viability. An increase in the number of housing developments, bright street lights, water detention ponds, and concentrations of people can be a detriment to aircraft and public safety.

Residential developments within the airport overlay zoning district should be planned and designed carefully. Safety issues related to concentrations of people and potential noise impacts need to be evaluated when considering development of single- or multi-family housing and manufactured housing parks. Best management practices include enhanced construction techniques such as additional insulation for roofs and walls; sound-deadening windows; and heating, ventilation, and air conditioning systems, as well as shifting development as far from the extended runway centerline as possible and limiting the density of persons in this area.

A brief discussion of the general concerns associated with the Residential classification of land use is provided on the following pages. **Table 2-1** contains additional details of specific types of development associated with this classification of land use and the areas of potential concern. This information is not intended to be an all-inclusive summary, but rather to provide a general understanding of the topic from which to begin an evaluation of compatible land use on a case-by-case basis for the surrounding municipalities.

#### • Noise Sensitivity

Residents within the vicinity of airports often perceive aircraft noise as a nuisance. Residents can implement measures to minimize the effects of aircraft noise on their quality of life. These measures are generally limited to changes to the interior of the home and can include adding additional insulation to roofs and walls, installing efficient windows and doors, or investing in a cooling system to limit the need to open windows in warmer weather. Unfortunately, the outdoor impacts of noise are often disregarded and can make outdoor activities an issue for some homeowners.

#### Tall Structures

Tall structures near an airport have the potential to impede safe aircraft movement during approach and departure and can also limit flight paths. Tall structures include, but are not limited to, multi-story buildings, light poles, natural vegetation, houses, and television or radio towers. The use of tall structures should be discouraged near the Airport or height limitations should be imposed so that structures do not breach FAR Part 77 surfaces.

#### Visual Obstructions

Residential developments have the potential to create visual obstructions that can affect safe aircraft navigation. Street or flood lighting has an intense or focused pattern of illumination, especially when positioned in an upward direction, which can create night blindness for pilots during approach and departure from an airport. Additionally, if streetlights are installed in a linear pattern near runway ends, a pilot may mistake the residential development as an extension of the runway or the pilot may assume the runway is in an incorrect location. These examples, while generally a minor issue, should be considered for proposed residential development in the vicinity of the Airport.

#### Wildlife and Bird Attractants

Aircraft wildlife strikes can devastate and debilitate an aircraft and potentially impact the safety of pilots and persons on the ground. Medium-density and high-density residential developments, such as condominium and apartment complexes, often require detention ponds to control storm water runoff. Additionally, open spaces within residential developments often attract wildlife by the presence of maintained grass areas and desirable vegetation. Both detention ponds and open spaces can attract wildlife, which can potentially increase the risk of aircraft wildlife strikes. If properly managed, water bodies and open space can be located within proximity to the Airport with minimal risk.

#### • Concentration of People (density)

Residential developments (see **Figure 2-14**) can generate a large number of people in a small area. If such developments exist near an airport, the potential for injury or casualty increases should an aircraft accident occur.

Figure 2-14 – Residential Development



Source: www.google.com

Multi-family units such as apartment complexes, condominiums, and manufactured housing parks contain a high density of people, while duplexes and small condominiums contain a moderate density of people. Aircraft fly at low altitudes as they approach and depart an airport, and have less opportunity to correct or recover from an unexpected event such as engine failure or equipment malfunction. The impact and potential wide spread debris from an aircraft accident can cause significant harm to surrounding residents. Careful consideration must be given to any request that involves residential development within the vicinity of the Airport.

| La Crosse Municipal Airport Land Use Compatibility Chart  |             |                          |            |                           |                  |  |  |  |
|---|-------------|--------------------------|------------|---------------------------|------------------|--|--|--|
| I=Impact P=Possible Impact N=No Impact  |             |                          |            |                           |                  |  |  |  |
| Land Uses <sup>1</sup>  | Noise       | Concentration            | Tall       | Visual                    | Wildlife and     |  |  |  |
|   | Sensitivity | of People                | Structures | Obstructions <sup>2</sup> | Bird Attractants |  |  |  |
|   |             | <b>Residential Activ</b> | vities     |                           |                  |  |  |  |
| Single-Family Uses (1 dwellir   | ng per lot) |                          |            |                           |                  |  |  |  |
| Multi-Family Uses<br>(Three or more principal dwelling units within a single building on the same parcel)<br>(e.g. apartment, condominium, townhouse-style) |             |                          |            |                           |                  |  |  |  |
| <i>Low-Rise</i> (2 to 3 Levels) or<br><i>Mid-Rise</i> (4-12 Levels)   | I           | Р                        | Ν          | Р                         | Р                |  |  |  |
| High-Rise (13+ Levels)  | I           | I                        | I          | I                         | I                |  |  |  |
| Group Living Uses<br>(e.g. assisted living, group care, independent group living, nursing and convalescent home)  |             |                          |            |                           |                  |  |  |  |
| Residential Group Living Units<br>(1 dwelling per lot)  | I           | Р                        | Ν          | Р                         | Р                |  |  |  |
| <i>Low-Rise</i> (2 to 3 Levels) or<br><i>Mid-Rise</i> (4-12 Levels)   | I           | Р                        | Ν          | Р                         | Р                |  |  |  |
| High-Rise (13+ Levels)  | 1           | I                        | I          | I                         | I                |  |  |  |
| Manufactured Housing Parks  | I           | I                        | Ν          | Р                         | I                |  |  |  |

#### Table 2-1 Land Use Compatibility Chart for Residential Activities

#### 2.3.b. Commercial Activities

Commercial activities often require specific review and evaluation by local planners to determine compatibility with airport operational areas. Diverse compatibility issues arise between airport environs and commercial land uses, which can make it difficult to generalize the benefits or detriments created by certain land use types. In general, smaller commercial developments are typically more desirable as a compatible land use than larger commercial developments. Strip malls offer smaller storefront locations and specialized retail options that bring comparatively lower concentrations of people then larger retail malls. However, both strip and retail commercial developments often have parking lot light emissions that can affect a pilot's vision and water detention areas that can attract wildlife.

A restaurant attracts a higher concentration of people than a convenience store. Additionally, patrons who use outdoor seating at a restaurant may be exposed to perceived noise impacts from aircraft approaching and departing from the airport, which can make the area a less viable or attractive land use. Local planners should carefully review the development of commercial activities near the Airport so concerns such as water detention, road alignments, wildlife attractants, lighting impacts, and building location do not create a hazard within the areas closest to the Airport.

<sup>&</sup>lt;sup>1</sup> The following information is not an all-inclusive list; however it provides guidance through listing a sample of land uses under each individual land use classification.

<sup>&</sup>lt;sup>2</sup> It should be noted that any land use containing a parking lot should be classified as a possible impact (P) due to the lighting issues associated with visual obstructions.

Mixed-development use is an emerging trend in planning that offers commercial, leisure, and residential uses in a single area, as seen in **Figure 2-15**. Such developments can include mixed-use buildings that incorporate retail or office space at the street level and living space in the upper levels, all within a central area. The combination of uses can create higher concentrations of people and may combine the safety and noise risks of both commercial and residential developments that have been identified above.



Figure 2-15 – Mixed Use Development

Source: www.google.com

A brief discussion of the general concerns associated with the Commercial classification of land use is provided on the following pages. **Table 2-2** contains additional details of specific types of development associated with commercial land use and the areas of potential concern. This information is not intended to be an all-inclusive summary; instead, it provides a general understanding of the topic from which to begin an evaluation of compatible land use on a case-by-case basis for the surrounding municipalities.

#### Noise Sensitivity

As previously noted, commercial activities can create noise sensitivity concerns due to the nature of their activities. Shopping centers and malls, such as open-air malls, often combine activities like walking, dining, and shopping. Also, many restaurants offer outdoor seating options to enhance the dining experience. Aircraft noise in an open-air setting can make the experience uncomfortable or undesirable for patrons. Other types of commercial development, such as movie theaters, may also experience noise related impacts if developed too close to airport operational areas.

#### • Concentration of People (density)

Commercial retail uses, which range from corner convenience stores to multi-acre mega malls, present various concerns related to compatible land use issues near airport property. Large malls attract a dense population of customers, contain large parking lots equipped with numerous lights, generate parking lot debris, and include sizeable trash containment areas and water detention basins. As discussed in prior sections, it is not desirable for a land use on or near the Airport to concentrate a population of people, affect a pilot's visual acuity, or attract wildlife and birds.

#### Tall Structures

Business and office parks are another land use that can generate airport compatibility issues. The types of buildings associated with such development can be defined as:

- Low-rise: one (1) to three (3) stories in height
- $\circ$  Mid-rise: four (4) to twelve (12) stories in height
- High-rise: thirteen (13) stories or more in height

Single-story office buildings with relatively low numbers of people are often considered compatible land uses. Concerns typically arise when taller, multi-story buildings are proposed because they attract greater concentrations of people and pose potential height obstructions. Moreover, these developments often require large water detention areas and open green spaces that act as wildlife attractants. Local planners should consider the height of all proposed structures near the Airport to preserve safe navigable airspace.

#### Visual Obstructions

The use of reflective building or landscaping materials may create a glare and pose a visual concern for pilots that arrive or depart from the Airport. Additionally, lighting for parking lots and structures should be evaluated to minimize or avoid visual obstructions for a pilot. Linear alignments of streetlights should be avoided, as well as indirect lighting that may create ambient light issues.

#### • Wildlife and Bird Attractants

Aircraft accidents caused by wildlife and bird strikes can endanger the flying public, as well as persons in the surrounding area. In order to maintain a safe operational environment, wildlife and bird attractants must be limited on and in proximity of airport property. Larger commercial developments require sufficient parking lot space to accommodate customers, which may supply birds and rodents with a food source. Facilities generally have flat roofs that encourage protected roosting habitats for birds. Large impermeable surface areas associated with commercial developments often necessitate the development of water detention and green space areas, which can serve as attractants to wildlife such as geese and gulls, both of which pose a significant hazard to aircraft. Thorough review by local planners should be completed to identify potential areas of concern related to wildlife and bird attractants on and near Airport property.

| La Crosse Municipal Airport Land Use Compatibility Chart  |                      |                            |                    |                                     |                                  |  |  |  |  |
|---|----------------------|----------------------------|--------------------|-------------------------------------|----------------------------------|--|--|--|--|
| I=Impact P=Possible Impact N=No Impact  |                      |                            |                    |                                     |                                  |  |  |  |  |
| Land Uses <sup>1</sup>  | Noise<br>Sensitivity | Concentration<br>of People | Tall<br>Structures | Visual<br>Obstructions <sup>2</sup> | Wildlife and<br>Bird Attractants |  |  |  |  |
| Commercial Activities   |                      |                            |                    |                                     |                                  |  |  |  |  |
| Eating & Drinking<br>Establishments<br>(e.g. restaurant, cafe, coffee<br>shop, fast food restaurant, bar,<br>nightclub, tavern, cocktail<br>lounge)                             | I                    | ī                          | Ρ                  | Ρ                                   | I.                               |  |  |  |  |
| General Office/Medical Office/D   | ental Office U       | ses                        | -                  |                                     |                                  |  |  |  |  |
| (e.g. professional, business, finar   | icial, governme      | ntal)                      |                    |                                     |                                  |  |  |  |  |
| Low-Rise (2 to 3 Levels)  | l l                  | Р                          | Ν                  | Р                                   | Р                                |  |  |  |  |
| Mid-Rise (4 to12 Levels)  | I                    | I                          | Р                  | Р                                   | Р                                |  |  |  |  |
| High-Rise (13+ Levels)  | I                    | I                          | I                  | Р                                   | I                                |  |  |  |  |
| Hospitality-Oriented  |                      |                            |                    |                                     |                                  |  |  |  |  |
| (e.g. hotel, motel, convention cen  | ter, meeting ha      | I, event facility)         |                    |                                     |                                  |  |  |  |  |
| Low-Rise (2 to 3 Levels)  |                      | Р                          | Ν                  | Р                                   | Р                                |  |  |  |  |
| Mid-Rise (4 to12 Levels)  | I                    | I                          | Р                  | I                                   | Р                                |  |  |  |  |
| <i>High-Rise</i> (13+ Levels)   |                      |                            | <b>I</b>           | I                                   | I                                |  |  |  |  |
| Outdoor Storage and<br>Display-Oriented<br>(e.g. outdoor storage-lumber<br>yard, vehicles sale, landscape<br>material & nursery product sale,<br>or farm supply equipment sale) | Ρ                    | Ρ                          | N                  | Ρ                                   | Ρ                                |  |  |  |  |

# Table 2-2 Land Use Compatibility Chart for Commercial Activities

<sup>&</sup>lt;sup>1</sup> The following information is not an all-inclusive list; however it provides guidance through listing a sample of land uses under each individual land use classification.

<sup>&</sup>lt;sup>2</sup> It should be noted that any land use containing a parking lot should be classified as a possible impact (P) due to the lighting issues associated with visual obstructions.

| La Crosse Municipal Airport Land Use Compatibility Chart   |             |               |            |                           |                         |  |  |  |  |
|--|-------------|---------------|------------|---------------------------|-------------------------|--|--|--|--|
| I=Impact P=Possible Impact N=No Impact   |             |               |            |                           |                         |  |  |  |  |
| Land Uses <sup>1</sup>   | Noise       | Concentration | Tall       | Wildlife and              |                         |  |  |  |  |
|  | Sensitivity | of People     | Structures | Obstructions <sup>2</sup> | <b>Bird Attractants</b> |  |  |  |  |
| Commercial Activities (Continued)  |             |               |            |                           |                         |  |  |  |  |
| <b>Personal Service-Oriented</b><br>(e.g. retail service, banking<br>facility, laundromat, dry<br>cleaning, quick<br>printing service, beauty salon,<br>tanning salon, funeral home) | Ρ           | Ρ             | Ρ          | Ρ                         | Ρ                       |  |  |  |  |
| Vehicle Servicing Uses<br>(e.g. full-serve gas station,<br>unattended card key<br>service station, vehicle repair<br>shop, tire sale)  | N           | Ρ             | N          | Ρ                         | N                       |  |  |  |  |
| Retail Uses  |             | ato)          |            |                           |                         |  |  |  |  |
| Small Sales-Oriented<br>(e.g. appliance, convenience<br>store, bakery, electronic,<br>furniture, garden supply,<br>grocery, hardware, video)   | P           | P             | Ρ          | Ρ                         | Ρ                       |  |  |  |  |
| Large Sales-Oriented<br>(e.g. big box store, mall, strip<br>mall)  | I           | <u> </u>      | Р          | <u> </u>                  | I                       |  |  |  |  |
| Surface Passenger<br>Services<br>(e.g. passenger terminal for<br>buses,<br>rail service, local taxi,<br>limousine service)   | Ρ           | I             | Ρ          | Ρ                         | Р                       |  |  |  |  |

#### Table 2-2 Land Use Compatibility Chart for Commercial Activities (Continued)

#### 2.3.c. Industrial/Manufacturing Activities

Industrial parks or areas designated to house industrial activities were historically composed solely of industrial uses. Today, however, industrial parks are often a mix of industrial businesses, manufacturing facilities, office parks, and research and development complexes within the same geographic area, as seen below in **Figure 2-16**. Occasionally, even hotels, restaurants, and retail activities have developed along the fringes of industrial parks to provide necessary support facilities and stimulate economic development within these areas. Industry and manufacturing land uses can include activities such as materials processing and assembly, lumber and wood product manufacturing, paper and allied product manufacturing, petroleum refining and related processing, primary metal manufacturing, product manufacturing, and storage of finished products. Each use has unique compatibility concerns, including the size of

<sup>&</sup>lt;sup>1</sup> The following information is not an all-inclusive list; however it provides guidance through listing a sample of land uses under each individual land use classification.

<sup>&</sup>lt;sup>2</sup> It should be noted that any land use containing a parking lot should be classified as a possible impact (P) due to the lighting issues associated with visual obstructions.

the facility, secondary uses, and height of the proposed development, each of which should be consulted by the FAA and planners within the communities near the Airport.



Figure 2-16 – Industrial Park

Source: www.google.com

Industrial and manufacturing areas are typically encouraged within a community as a means to attract business, increase business tax base and employment levels, and enhance economic benefits to the community. These areas are often located in proximity to major transportation arteries such as highways, interstates, railroads, and airports in order to provide inter-modal connectivity. Transportation arteries are critical for companies to increase productivity and allow for just-in-time delivery options that are becoming more prevalent in the current economy.

A brief discussion of the general concerns associated with the Industrial/Manufacturing classification of land use is provided on the following pages. Aircraft or airport noise is usually a minor or non-existent issue because industrial and manufacturing land uses often generate noise. The level of concern for the other impacts depends on the size and type of development, as well as the location of the facility relative to the Airport. **Table 2-3** contains additional details of specific types of development associated with this classification of land use and the areas of potential concern. This information is not intended to be an all-inclusive summary; instead, it is meant to provide a general understanding of the topic from which to begin an evaluation of compatible land use on a case-by-case basis for each of the surrounding municipalities.

#### • Noise Sensitivity

Industrial and manufacturing activities generally create ambient sounds and therefore typically do not raise a concern with regard to airport noise compatibility issues. Aircraft noise tends to blend into background sounds and does not create a nuisance for people

within the facility. However, when considering the outdoor environment (e.g. outdoor break or lunch areas), aircraft noise can be a concern and should be considered if these types of uses are present. Manufacturing land uses that utilize equipment sensitive to noise or vibration may be discouraged within the vicinity of the Airport.

#### • Concentration of People (density)

The concentrations of people associated with a facility can vary depending on the types of industrial or manufacturing uses. Some industries can be very labor intensive and require a large number of employees to be within a facility at a given time. Other businesses, like warehousing, may require a minimal number of employees to remain operational. However, it is recommended that consideration be given to the number of employees that will be at the facility when siting industrial development within the vicinity of the Airport,.

#### Tall Structures

The height of structures associated with industrial and manufacturing land uses may raise concerns. Ethanol and manufacturing plants often have tall ventilation or smoke stacks that extend to a height that can create an obstruction to navigable airspace. Height limits should be imposed to avoid impact issues within the vicinity of the Airport.

#### Visual Obstructions

Industrial and manufacturing plants often generate smoke or steam from facility operations, which can create visual impacts to the surrounding area by obscuring visibility and precluding a pilot from having an accurate view during approach, departure, and low-level flight altitudes. When siting the development, it is important to evaluate issues such as the location of the building and the prevailing wind direction, which will carry the smoke or steam away from the facility.

Industrial and manufacturing land use areas can emit significant high-intensity light in loading dock and cargo transfer areas and from fixtures in parking lots. Light emissions may cause visibility concerns for pilots when aircraft pass through areas of intense light and then back in to areas of darkness. To reduce ambient lighting concerns, zoning regulations can require installation of light fixtures with directional aiming options, as well as control placement of lights to minimize potential impacts.

Reflective surfaces are also a significant concern for a pilot because they can potentially produce a disruptive glare and compromise a pilot's vision. Some types of industrial developments, such as ethanol plants or petroleum refineries, have large storage tanks that are often constructed of metal or have reflective surfaces. Municipal planners and the elected officials in the municipalities neighboring the Airport should consider these factors during the site plan review process to minimize potential impacts prior to development.
## • Wildlife and Bird Attractants

Industrial and manufacturing land uses can generate habitats and opportunities that are inviting to wildlife and birds. Such land uses often have buildings that offer roosting opportunities for birds, as well as habitats for small rodents and mammals. Trash storage facilities and parking lots can generate debris such as discarded food containers, which offer a potential food source for animals. Also, water detention areas can provide food, water, and habitat opportunities for wildlife. As birds fly between these areas to other roosting or food sources, they create a flight path that may interfere with the approach or departure of aircraft. All of the above are undesirable situations that can be limited with proper placement and management of areas that serve as wildlife attractants.

Landfills and similar facilities such as composting areas, recycling centers, sanitary and water treatment facilities, and waste sorting can act as wildlife attractants and require proper maintenance to avoid undesirable impacts. FAA AC 150/5200-34A, Construction or Establishment of Landfills near Public Airports, addresses the development and management of landfills. This AC provides guidance to comply with 49 U.S.C. 44718(d) as amended by Section 503 of the Wendell H. Ford Aviation Investment and Reform Act for the 21<sup>st</sup> Century (AIR-21) Public Law No. 106-181 (April 5, 2000). This code section restricts the construction or establishment of a Municipal Solid Waste Landfill (MSWLF) within six (6) miles of a public airport that receives federal grants and primarily serves general aviation aircraft and scheduled air carrier operations using aircraft with fewer than 60 passenger seats. In addition, 40 CFR 258, Subpart B, Criteria for Municipal Solid Waste Landfills, requires that owners or operators who propose to site new MSWLF units and lateral expansions within a five (5)-mile radius of any airport runway end used by turbojet or piston-type aircraft must notify the affected airport and the FAA, and must demonstrate that the units are designed and operated in such a way that the they does not pose a bird hazard to aircraft.

It should be noted that a solid waste landfill and the La Crosse County landfill are located 2.5 and 4 miles outside of the Airport, respectively. Currently, neither site presents a problem for operations at the Airport. However, measures should be taken to maintain compatibility, and a plan of action developed if any problems arise. Furthermore, additional landfill development, whether at a new site or an expansion of an existing site, should be discouraged in the area between five (5) and six (6) miles from the Airport for reasons stated previously.

Sanitary and water treatment facilities generally attract a large number of birds due to the combination of water bodies and open green space that surround the facilities. Large concentrations of birds can pose a threat to aircraft safety during low-level flight near treatment facility areas. Some communities have considered the co-use of airport property with wastewater treatment facilities, an arrangement that would appear to be a beneficial use of property. However, spraying or disposal of wastewater improves the soil quality, which in turn can attract insects, small mammals, and birds looking for a food

source. This potentially increases the potential for wildlife strikes as the number of wildlife in the area around the airport increases. Consequently, it is recommended that sanitary and wastewater treatment facilities be located away from Airport property.

| La Crosse Municipal Airport Land Use Compatibility Chart |                  |                      |             |                           |              |  |
|--|------------------|----------------------|-------------|---------------------------|--------------|--|
| I=I  | mpact P=P        | ossible Impact       | N=No Impact |                           |              |  |
| Land Uses <sup>1</sup>                                   | Noise            | Concentration        | Tall        | Visual                    | Wildlife and |  |
|  | Sensitivity      | of People            | Structures  | Obstructions <sup>2</sup> | Bird         |  |
|  |                  |                      |             |                           | Attractants  |  |
|  | Industrial       | Manufacturing A      | ctivities   |                           |              |  |
| Industrial Service Uses                                  |                  |                      |             |                           |              |  |
| (e.g. machine shop, tool repair,                         | Ν                | I                    | Р           | Р                         | Р            |  |
| supply vard exterminator)                                |                  |                      |             |                           |              |  |
| Manufacturing and Production Uses                        |                  |                      |             |                           |              |  |
| (e.g. manufacturing, processing, fabric                  | ation, packaging | g or assembly of goo | ds)         |                           |              |  |
| General Manufacturing                                    |                  |                      |             |                           |              |  |
| (e.g. manufacturing, assembling or                       | Ν                | 1                    | Р           | 1                         | Р            |  |
| treatment of most articles, materials,                   |                  | -                    | -           | -                         |              |  |
| Heavy Manufacturing                                      |                  |                      |             |                           |              |  |
| (e.g. concrete/asphalt plant, meat                       |                  |                      |             |                           |              |  |
| packing plant, wet corn milling,                         | Ν                | Р                    | I.          | I. I.                     | I.           |  |
| paper mill, ethanol plant, animal                        |                  |                      |             |                           |              |  |
| feed)  |                  |                      |             |                           |              |  |
| Mining and Extraction Uses                               | N                | Р                    | Р           | I.                        | Р            |  |
| Salvage Operations                                       |                  |                      |             |                           |              |  |
| (e.g. collect, store, and dismantle                      | N                | N                    | Р           | Р                         | Р            |  |
| damaged of discarded vehicles,                           | IN               | N                    | P           | F                         | P            |  |
| material)  |                  |                      |             |                           |              |  |
| Self-Service Storage Uses                                |                  |                      |             |                           |              |  |
| (e.g. mini-warehouse,                                    | Ν                | Ν                    | Ν           | Р                         | Р            |  |
| storage facility)  |                  |                      |             | -                         |              |  |
| Warehouse and Freight Uses                               |                  |                      |             |                           |              |  |
| (e.g. major wholesale distribution                       | N                | N                    | P           |                           |              |  |
| center, freight storage, railroad                        | N                | N                    | Р           | I                         | I            |  |
| switching yard)  |                  |                      |             |                           |              |  |
| Waste-Related Uses                                       |                  |                      |             |                           |              |  |
| (e.g. recycling center, sanitary                         | Ν                | Ν                    | Ν           | в                         | в            |  |
| composting sanitary or                                   | IN               | IN                   | IN          | F                         | F            |  |
| water treatment facility)                                |                  |                      |             |                           |              |  |
| Wholesale Sales Uses                                     |                  |                      |             |                           |              |  |
| (e.g. sale, lease, rental of products                    | Ν                | Р                    | Р           | Р                         | Р            |  |
| to retailers for industrial, institutional,              |                  | •                    | •           | •                         | •            |  |
| or commercial business users)                            |                  |                      |             |                           |              |  |

# Table 2-3 Land Use Compatibility Chart for Industrial/Manufacturing Activities

<sup>1</sup> The following information is not an all-inclusive list; however it provides guidance through listing a sample of land uses under each individual land use classification.

<sup>2</sup> It should be noted that any land use containing a parking lot should be classified as a possible impact (P) due to the lighting issues associated with visual obstructions.

## 2.3.d. Institutional Activities

Institutional land uses typically should not be located on or near an airport due to noise sensitivity and the risk associated with concentration of people. Such land uses include, but are not limited to, places of worship, day care and elder care centers, hospitals (see **Figure 2-17**), health care facilities, and educational facilities. These types of facilities may contain people who are unable to care for themselves, making evacuation difficult in the event of an aircraft accident. Institutional land uses can also contain large parking lots and water detention areas that can contribute to light emission and wildlife attractant concerns.



Figure 2-17 Institutional Use - Hospital

#### Source: www.google.com

A brief discussion of the general concerns associated with the Institutional classification of land use is provided on the following pages. **Table 2-4** contains additional details of specific types of development associated with this classification of land use and the areas of potential concern. This information is not intended to be an all-inclusive list; instead, it provides a general understanding of the topic from which to begin an evaluation of compatible land use on a case-by-case basis for the surrounding municipalities.

#### Noise Sensitivity

Aircraft noise can often create a nuisance for social land uses and institutions in the vicinity of an airport. Noise impacts have been determined to affect people's quality of life and also the quality of service within affected areas. Noise can be considered a detriment to the learning process at schools and universities because of the distraction that aircraft noise can create. Vibrations related to aircraft noise can affect hospitals and health care facilities. Ideally, institutional land uses should be precluded from development near the Airport. If this is not feasible, various measures can be taken to minimize aircraft noise impacts. Specific noise reducing building materials and construction techniques can be used as a mitigation measure, such as the installation of additional insulation to the roof and walls of existing structures or the use of energy efficient windows to limit the amount of audible aircraft noise impacts.

As with residential land uses, outdoor impacts are left unaddressed and the best practice is to prohibit noise sensitive facilities within the vicinity of the Airport.

## • Concentration of People (density)

Hospitals, places of worship, and educational and institutional facilities typically contain large concentrations of people and are considered an incompatible land use with airport operations. Time spent within each of the above facilities varies depending on the function of that establishment. For example, the duration of time people congregate in a place of worship is typically limited compared to the amount of time people spend in hospitals, educational facilities, or institutional facilities. Limited time duration may suggest that such land uses could be compatible with airport operations, since the exposure time for a potential aircraft incident is lower. However, this might not be the case if the use of the facility increases over time. Consequently, these land uses should be precluded in the vicinity of the Airport.

Additionally, some facilities have mobility or access concerns for the occupants. Hospitals are typically multi-story structures and accommodate patients with limited mobility or those who are dependent on others, including infants and small children. This can create a challenge if an evacuation is necessary due to an aircraft accident. Also, schools are occupied by a large numbers of students and a limited number of adults, which can place the occupants in danger if the building must be evacuated. Facilities that promote large congregations of people should not be developed within proximity to the runway or runway ends of the Airport due to the safety issues that may arise if an aircraft incident occurs.

#### Tall Structures

Consideration should be given to the height of structures associated with institutional uses such as hospitals, places of worship, and educational facilities, to limit potential FAR Part 77 *Surface* penetrations. Multi-story hospitals, schools, and universities, as well as associated parking lot light structures, should not be located near Airport property due to height concerns.

# Visual Obstructions

Institutional facilities raise many safety concerns regarding visual obstructions that affect safe airport operations such as glare, light emission, steam, and smoke. Large parking lots are usually associated with these types of land uses. Lights used to illuminate parking lots can create potential emission issues if they are not properly installed and down shielded to reduce ambient lighting into aircraft operational areas. Additionally, institutional facilities often contain a large number of windows that can reflect light or create a potential glare that can affect a pilot's vision during approach, departure, and low-level flight altitudes.

# • Wildlife and Bird Attractants

Institutional land uses often include detention ponds to control storm water runoff. Ponds have a tendency to attract wildlife, which can pose a significant risk to airport operations. Additionally, parking lot and waste storage areas should be maintained and kept clear of litter to avoid creating a food source for small mammals. Mammals can attract large-bodied birds such as raptors (e.g. hawks, owls, and falcons), which pose a serious hazard to flying aircraft. If managed properly, detention ponds, parking lots, and waste storage areas can be located within the vicinity of the Airport. However, given the concerns in the other four (4) areas, institutional development is not encouraged near the Airport.

| La Crosse Municipal Airport Land Use Compatibility Chart  |                      |                         |                    |                                     |                                     |  |  |  |
|---|----------------------|-------------------------|--------------------|-------------------------------------|-------------------------------------|--|--|--|
| I=Impact P=Possible Impact N=No Impact  |                      |                         |                    |                                     |                                     |  |  |  |
| Land Uses <sup>1</sup>  | Noise<br>Sensitivity | Concentration of People | Tall<br>Structures | Visual<br>Obstructions <sup>2</sup> | Wildlife<br>and Bird<br>Attractants |  |  |  |
|   | Instit               | tutional Activities     | ;                  |                                     |                                     |  |  |  |
| <b>College and Universities</b><br>(e.g. public or private college<br>or university, technical college,<br>seminary)  | I                    | I                       | Т                  | I                                   | 1                                   |  |  |  |
| <b>Community Service Uses</b><br><i>General Community Service</i><br>(e.g. library, museum, transit center,<br>senior/community center,<br>police/fire/station) | I                    | I                       | Ρ                  | I                                   | I                                   |  |  |  |
| Daycare Uses - (e.g. childcare centers,   | adult daycare, p     | preschools, after sch   | ool programs)      |                                     |                                     |  |  |  |
| Residential Daycare Uses<br>(e.g. in-home adult/child daycare<br>facility)  | I                    | I                       | Ρ                  | I                                   | I.                                  |  |  |  |
| Institutional Daycare Uses<br>(e.g. childcare center, preschool,<br>after school program, adult daycare)  | I                    | I                       | Р                  | I                                   | Р                                   |  |  |  |
| <b>Detention Facilities</b><br>(e.g. prison, jail, probation center,<br>halfway house, juvenile detention<br>home)  | I                    | I                       | Ρ                  | I                                   | I                                   |  |  |  |
| Educational Facilities  |                      |                         |                    |                                     |                                     |  |  |  |
| General Educational Facilities<br>(e.g. public and private elementary,<br>middle, junior, and senior high school<br>including religious, boarding, military)    |                      |                         | I                  | I                                   | T                                   |  |  |  |
| Specialized Education Facilities<br>(e.g. specialized trade, business, or<br>commercial courses, non-degree<br>granting school)                                 | I                    | I                       | Ρ                  | Ρ                                   | Ρ                                   |  |  |  |
| Hospitals<br>(e.g. hospital and medical center)   | I                    | l                       | I                  | I                                   | I                                   |  |  |  |
| Religious Assembly Uses<br>(e.g. church, temple, mosque,<br>Masonic, synagogue,<br>eagles/moose/elk lodge)  | I                    | I                       | I                  | I                                   | Ρ                                   |  |  |  |

# Table 2-4 Land Use Compatibility Chart for Institutional Activities

<sup>&</sup>lt;sup>1</sup> The following information is not an all-inclusive list; however it provides guidance through listing a sample of land uses under each individual land use classification.

 $<sup>^2</sup>$  It should be noted that any land use containing a parking lot should be classified as a possible impact (P) due to the lighting issues associated with visual obstructions.

## 2.3.e. Infrastructure Activities

Infrastructure activities include a variety of land uses such as cellular communication towers, water towers, and wind farms. As noted in the following paragraphs, each land use has compatibility concerns that should be assessed prior to construction within the vicinity of the Airport.

The growing popularity of cellular communication has prompted the construction of an abundance of towers around the nation. Cellular communication towers have appeared and continue to multiply in business parks, industrial and shopping mall areas, and along the national highway infrastructure. As a result, cellular communication towers have become a significant concern when evaluating height issues near airport environs. These towers can affect aircraft during low-level flight, approach, and departure.

Wind farms are becoming increasingly prevalent as renewable energy gains momentum in the United States. Wind farms generally contain numerous wind turbines that are typically very tall and cover a sizeable area, as seen in **Figure 2-18**. Wind farms can also cause potentially hazardous conditions for air traffic controllers if they create clutter on radar screens, which increases the difficulty to recognize aircraft. However, a study conducted in June 2003 by the British Department of Trade and Industry (DTI), *American Wind Energy Association, Wind Turbines and Radar An Informal Resource*, determined that efforts can be implemented to reduce or eliminate wind turbine clutter effects on air traffic control radar systems. Additionally, wind turbine blades can generate glare, which can create potential visual problems for a pilot. Many of the impacts associated with wind farms can be mitigated during the design phase of the facility, as long as the local community and developer are mindful of potential concerns and work to address them early.



#### Figure 2-18 Wind Farm

Source: www.google.com

A brief discussion of the general concerns associated with the Infrastructure classification of land use is provided on the following pages. **Table 2-5** contains additional details of specific types of development associated with this classification of land use and the areas of potential concern. This information is not intended to be an all-inclusive summary; instead, it provides a general understanding of the topic from which to begin an evaluation of compatible land use on a case-by-case basis for the surrounding municipalities.

#### Noise Sensitivity

Infrastructure land uses are not sensitive to noise associated with aircraft operations and are therefore not a concern within this topic.

## • Concentration of People (density)

Infrastructure land uses do not contribute to an increase in density and are therefore not a concern within this topic.

## Tall Structures

The land uses identified within this category can be built to heights that may be hazardous to aircraft. Cellular towers may reach heights in-excess of 250 feet and encroach upon navigable airspace, which creates a hazard to aircraft safety and the welfare of people on the ground. Wind turbines associated with wind farms can reach 300 to 400 feet in height and also pose a hazard to aircraft navigation.

#### Visual Obstructions

Wind farms, cellular communication towers, and water towers generate height and visual obstruction concerns. The FAA requires that any structure over 200 feet in height be illuminated with warning lights for aircraft. Illumination of these structures can create a significant amount of light emission and present a potential hazard to aircraft navigation, as well as cause potential night blindness for pilots during low-level flights, approaches, and departures. Depending on the configuration, pilots could mistake the lights for a city or possibly an airport. Additionally, turbine blades can produce a glare if constructed from reflective materials.

#### • Wildlife and Bird Attractants

Communication towers, water towers, and wind farms are not identified as significant wildlife attractants. Such uses do not commonly have areas of standing water or open vegetation that serve as nesting or feeding areas for wildlife or birds.

| La Crosse Municipal Airport Land Use Compatibility Chart   |  |                         |                    |                                     |                                     |  |  |  |
|--|--|-------------------------|--------------------|-------------------------------------|-------------------------------------|--|--|--|
|  | I=Impact P=Possible Impact N=No Impact |                         |                    |                                     |                                     |  |  |  |
| Land Uses <sup>1</sup>   | Noise<br>Sensitivity                   | Concentration of People | Tall<br>Structures | Visual<br>Obstructions <sup>2</sup> | Wildlife and<br>Bird<br>Attractants |  |  |  |
|  |  | Infrastructu            | re                 |                                     |                                     |  |  |  |
| Basic Utility Uses<br>(e.g. utility or electrical<br>substation)   | N                                      | Ν                       | Р                  | <u> </u>                            | I                                   |  |  |  |
| Communication<br>Transmission Facility Uses<br>(e.g. broadcast, wireless, point<br>to point, or emergency tower<br>and antennae) | N                                      | N                       | I                  | I                                   | Ρ                                   |  |  |  |
| Parking Uses<br>(e.g. ground lot, parking<br>structure)  | N                                      | Р                       | I                  | Ρ                                   | Ρ                                   |  |  |  |
| Transportation Uses<br>(e.g. local or county road,<br>highway, interstate)   | N                                      | Р                       | N                  | Р                                   | Ν                                   |  |  |  |
| Utility Uses<br>(e.g. wind generator, wind farm,<br>solar power generation<br>equipment, water tower)                            | Ν                                      | Ν                       | I                  | I                                   | Ν                                   |  |  |  |

# Table 2-5 Land Use Compatibility Chart for Infrastructure Activities

# 2.3.f. Agriculture and Open Space Activities

Agriculture and open space land uses are typically considered compatible with airport operations because they have relatively low concentrations of people, limited concerns associated with visual obstructions or penetrations to navigable airspace, and limited impacts related to noise sensitivity. However, the uses are often wildlife attractants. Agriculture and open space activities cover an array of land uses, such as agricultural (row crops, orchards, vineyards, farms) as seen in **Figure 2-19**, natural areas, tree farms, water bodies, and wetland areas.

<sup>&</sup>lt;sup>1</sup> The following information is not an all-inclusive list; however it provides guidance through listing a sample of land uses under each individual land use classification.

<sup>&</sup>lt;sup>2</sup> It should be noted that any land use containing a parking lot should be classified as a possible impact (P) due to the lighting issues associated with visual obstructions.



Figure 2-19 Row Crops

Source: www.google.com

Open water bodies provide wildlife and birds with opportunities to drink, bath, feed, loaf, roost, and seek protection. Open water can include a wide range of water bodies such as, but not limited to:

- Sumps
- Swamps
- Wetlands
- Storm water detention areas
- Water quality treatment areas
- Borrow Pits
- Creeks
- Lakes
- Ponds
- Rivers

Significant concern regarding wildlife attractants exists at the Airport due to its location along the Mississippi River and within the Upper Mississippi River National Wildlife & Fish Refuge, which provides breeding grounds for migratory birds, fish, wildlife, and plants. **Figure 2-20** shows the location of the Airport within the Refuge. Thousands of migratory birds are found in the Refuge at the peak of the waterfowl migration, including a large percentage of the nation's canvasback duck population, which rests in the water located off of Runway 31. Since the open water attracts the canvasback duck and other waterfowl and animal species, coordination between the Airport and local natural resource agencies is necessary in order to identify the specific species of wildlife, birds, and waterfowl that are a hazard to the Airport, as well as develop a management plan for the specific species indigenous to local airport conditions.



Figure 2-20 Upper Mississippi River National Wildlife & Fish Refuge

Source: United States Fish & Wildlife Service

In addition to open water, wildlife is often attracted to agricultural activities. The proximity of farmland to airports, especially row crops and orchards, may cause detrimental interactions between wildlife and aircraft. If crops are highly attractive to birds or wildlife for their nutritive or nesting value, the risk increases.

The USDA bulletin *Plants Attractive to Wildlife* provides a list of cultivated plants that can attract wildlife as a food source or as shelter. For example, small mammals can be attracted to planted fields of row crops that provide cover. Large predatory birds are often attracted to these same areas because of the presence of the small mammals, birds, and other rodents that hide in and feed on the crops and neighboring tall grasses. This can create a detrimental cycle of wildlife attractants that may lead to wildlife and bird strikes with approaching and departing aircraft.

As a part of the Wildlife Hazard Assessment completed at the Airport, recommendations were made to eliminate agricultural leases due to the location of the Airport within the Upper Mississippi River National Wildlife & Fish Reserve. The existence of agricultural uses near the Airport pose such a significant concern to the safety of airport operations that it is strongly recommended these uses are mitigated.

If crops have to be grown in proximity to the Airport, best management practices should be implemented to reduce incompatibility with Airport operations. Best management practices can include reducing the amount of crops left in the field during harvest operations, selecting crops that are less attractive to wildlife as a food or shelter source, and notifying the Airport when harvest or planting operations are to take place that may attract wildlife so the Airport can alert pilots that potential wildlife may be in the area.

Coordination of land use concerns between the Airport, the surrounding municipalities, and local neighbors such as farmers and horticulturists is crucial to reduce the potential of wildlife strikes.

While the growth of agricultural products is generally discouraged in the vicinity of an airport, the FAA and many state agencies have acknowledged that agricultural uses are much more compatible with airport environs then all other uses. Consequently, the FAA has acknowledged that if agricultural uses are to take place on or near an airport, certain dimensional standards should be adhered to. The dimensional standards are illustrated below in **Table 2-6** and found in AC 150/5300-13 Change 11, *Airport Design*, Appendix 17, *Minimum Distances Between Certain Airport Features and any On-Airport Agriculture Crops*.

A brief discussion of the general concerns associated with the Agriculture and Open Space classification of land use is provided on the following pages. Table 2-7 contains additional details of specific types of development associated with this classification of land use and the areas of potential concern. This information is not intended to be an all-inclusive summary; instead, it provides a general understanding of the topic from which to begin an evaluation of compatible land use on a case-by-case basis for the surrounding municipalities.

#### Noise Sensitivity

Noise sensitivity is generally not a compatibility concern with agriculture and open space activities due to the limited number of people who are exposed to potential noise impacts.

#### • Concentration of People (density)

Agriculture and open space land uses are not generally foreseen as an airport compatibility concern in relation to density as these areas of development are usually associated with a small number of people.

| Aircraft Approach<br>Category and Design | Distance in Feet From<br>Runway Centerline<br>to Crop |                  | Distance in Feet<br>From Runway End<br>to Crop |          | Distance in<br>Feet from<br>Centerline of | Distance in<br>Feet from |  |  |
|--|---|------------------|--|----------|---|--------------------------|--|--|
| Group <sup>1</sup>                       | Visual &<br><u>&gt;</u> ¾ Mile                        | < ¾ Mile         | Visual &<br><u>&gt;</u> ¾ Mile                 | < ¾ Mile | Taxiway to<br>Crop                        | to Crop                  |  |  |
| Category A & B Aircraft                  |   |                  |  |          |   |                          |  |  |
| Group I                                  | 200 <sup>2</sup>                                      | 400              | 300 <sup>3</sup>                               | 600      | 45  | 40                       |  |  |
| Group II                                 | 250   | 400              | 400 <sup>3</sup>                               | 600      | 66  | 58                       |  |  |
| Group III                                | 400   | 400              | 600  | 800      | 93  | 81                       |  |  |
| Group IV                                 | 400   | 400              | 1,000  | 1,000    | 130                                       | 113                      |  |  |
| Category C, D, & E Aircraft              |   |                  |  |          |   |                          |  |  |
| Group I                                  | 530 <sup>3</sup>                                      | 575 <sup>3</sup> | 1,000  | 1,000    | 45  | 40                       |  |  |
| Group II                                 | 530 <sup>3</sup>                                      | 575 <sup>3</sup> | 1,000  | 1,000    | 66  | 58                       |  |  |
| Group III                                | 530 <sup>3</sup>                                      | 575 <sup>3</sup> | 1,000  | 1,000    | 93  | 81                       |  |  |
| Group IV                                 | 530 <sup>3</sup>                                      | 575 <sup>3</sup> | 1,000  | 1,000    | 130                                       | 113                      |  |  |
| Group V                                  | 530 <sup>3</sup>                                      | 575 <sup>3</sup> | 1,000  | 1,000    | 160                                       | 138                      |  |  |
| Group VI                                 | 530 <sup>3</sup>                                      | 575 <sup>3</sup> | 1,000  | 1,000    | 193                                       | 167                      |  |  |

| Table  | 2-6   | Minimum | Distances | Between | Certain | Airport | Features | and | Any | <b>On-Airport</b> |
|--------|-------|---------|-----------|---------|---------|---------|----------|-----|-----|-------------------|
| Agricu | Iture | Crops   |           |         |         |         |          |     |     |                   |

1. Design Groups are based on wing span or tail height and Category depends on approach speed of the aircraft, as shown below:

| Design Group                              | Category                                    |
|---|---|
| Group I: Wing span up to 49 ft.           | Category A: Speed less than 91 knots        |
| Group II: Wing span 49 ft. up to 79 ft.   | Category B: Speed 91 knots up to 121 knots  |
| Group III: Wing span 79 ft. up to 118 ft. | Category C: Speed 121 knots up to 141 knots |
| Group IV: Wing span 118 ft. up to 171 ft. | Category D: Speed 141 knots up to 166 knots |
| Group V: Wing span 171 ft. up to 214 ft.  | Category E: Speed 166 knots or more         |
| Group VI: Wing span 214 ft. up to 262 ft. |   |

- 2. If the runway will only serve small airplanes (12,500 lb. and under) in Design Group I, this dimension may be reduced to 125 feet; however, this dimension should be increased where necessary to accommodate visual navigational aids that may be installed. For example, farming operations should not be allowed within 25 feet of a Precision Approach Path Indicator (PAPI) light box.
- 3. These dimensions reflect the Threshold Siting Surface (TSS) as defined in AC 150/5300-13, Appendix 2. The TSS cannot be penetrated by any object. Under these conditions, the TSS is more restrictive than the OFA. The dimensions shown here are to prevent penetration of the TSS by crops and farm machinery.

Source: FAA AC 150/5300-13 Change 14 Airport Design, Appendix 17

# • Tall Structures

In conjunction with the growth of natural vegetation, tree height can be a concern around airport property, especially within the approach and departure ends of the runway. FAR Part 77 should be considered when evaluating the height of development and the placement of landscaping vegetation within proximity to the Airport environs.

# Visual Obstructions

Agriculture and open space activities generally do not create visual obstruction concerns in the vicinity of Airport property. However, consideration should be given to the location of open water as it can reflect sunlight upward, sometimes blinding pilots during the approach or departure phase of flight.

# • Wildlife and Bird Attractants

Agriculture and open space land uses have a significant potential to generate wildlife and bird attractants if the areas are not managed properly. These areas can provide shelter and/or feeding areas for a variety of wildlife and birds within the vicinity of the Airport. These impacts are focused both on potential aircraft strikes while in the air and aircraft strikes while on the ground.

| La Crosse Municipal Airport Land Use Compatibility Chart   |  |                         |                    |                                     |                                     |  |  |  |
|--|--|-------------------------|--------------------|-------------------------------------|-------------------------------------|--|--|--|
|  | I=Impact P=Possible Impact N=No Impact |                         |                    |                                     |                                     |  |  |  |
| Land Uses <sup>1</sup>   | Noise<br>Sensitivity                   | Concentration of People | Tall<br>Structures | Visual<br>Obstructions <sup>2</sup> | Wildlife and<br>Bird<br>Attractants |  |  |  |
|  | Agricul                                | ture and Open S         | pace Activities    |                                     |                                     |  |  |  |
| Agricultural Uses<br>(e.g. commercial cultivation of pla   | ants, livestock pr                     | oduction)               |                    |                                     |                                     |  |  |  |
| (e.g. livestock , dairy , horse<br>farm, crop farming, vegetable,<br>fruit, tree, wholesale plant<br>nursery)                  | N                                      | Ν                       | Р                  | N                                   | I                                   |  |  |  |
| <i>Facility-related</i><br>(e.g. fuel bulk storage or<br>pumping facility, grain elevator,<br>or livestock, seed, grain sales) | Ρ                                      | Ρ                       | I                  | Ρ                                   | I                                   |  |  |  |
| Resident-related<br>(e.g. single-family home or<br>mobile home if converted to<br>real property and taxed)                     | I                                      | Ν                       | Ρ                  | Ρ                                   | I                                   |  |  |  |
| Water Bodies<br>Man-made resources<br>(e.g. mining/extraction pond,<br>wetland mitigation site)                                | Ν                                      | Ν                       | Ν                  | I                                   | I                                   |  |  |  |
| Wildlife Preservation Areas<br>(e.g. petting zoo, wildlife<br>rehabilitation center, zoo)                                      | I                                      | Р                       | N                  | I                                   | I                                   |  |  |  |

# Table 2-7 Land Use Compatibility Chart for Agriculture and Open Space Activities

# 2.3.g. Parks and Recreation Activities

Parks and recreational land uses are characteristically outdoors and can generate a number of concerns with airport compatibility. Recreational activities can include passive activities such as resting on a park bench or having a picnic, or physical activities such as fishing, swimming, hunting, and participating in sporting events.

In general, potential noise impacts, congregations of people, and wildlife attractants are the primary areas of concerns for land uses in the Parks and Recreational category. Land uses that can create such concerns include, but are not limited to, racetracks, sports arenas, golf courses, casinos, traditional parks, sport parks, campgrounds, and playgrounds. These facilities often include large parking lots and extensive lighting and generate high concentrations of people and wildlife attractants, all of which are not compatible with airport property.

Casinos represent another growing recreational land use. Casinos have large facilities that may accommodate a significant amount of people. Moreover, casinos often have large parking lots

<sup>&</sup>lt;sup>1</sup> The following information is not an all-inclusive list; however it provides guidance through listing a sample of land uses under each individual land use classification.

<sup>&</sup>lt;sup>2</sup> It should be noted that any land use containing a parking lot should be classified as a possible impact (P) due to the lighting issues associated with visual obstructions.

and extensive lighting and large flashing billboards to announce events. Casinos may have restaurants that attract wildlife due to food in trash receptacles and litter in the parking lots, as well as roosting areas on rooftops and light poles.

Golf courses were previously considered to be a compatible land use because of their large open spaces (as seen in **Figure 2-21**), low concentrations of people, and minimal lighting requirements. However, golf courses do have manicured lawns, trees, grasses, and water bodies that can attract birds, rodents, and wildlife to the area to feed, nest, rest, or roost. Consequently, golf courses are now determined to be an incompatible use. The FAA has acknowledged that in some instances airports have constructed golf courses on airport property prior to their determination as an incompatible use; therefore, such golf courses are allowed to remain. Golf is often used as a relaxing and meditative event and when located on or near an airport, aircraft noise can lessen the enjoyment of the activity. In addition, due to the cleared open areas on a golf course, noise from aircraft operations has a tendency to carry for long distances, causing a quality of life issue for residents surrounding both the airport and the golf course.



Figure 2-21 Golf Course

Source: www.google.com

More traditional parks and recreational activities such as camping and playgrounds also have quality of life impacts due to aircraft noise and hazards associated with aircraft accidents. Parks generally contain groups of people and attract wildlife due to the litter found on the ground. All of the parks and recreational land uses introduced above are discouraged within the vicinity of the Airport.

A brief discussion of the general concerns associated with the Parks and Recreational classification of land use is provided on the following pages. **Table 2-8** contains additional details of specific types of development associated with this classification of land use and the areas of potential concern. This information is not intended to be an all-inclusive summary; instead, it

provides a general understanding of the topic from which to begin an evaluation of compatible land use on a case-by-case basis for the surrounding municipalities.

#### Noise Sensitivity

Many parks and recreational activities can be exposed to aircraft noise. In many instances, the impacts associated with exposure to aircraft noise are not significant enough to warrant corrective action, yet the perception of the impact still exists. Consequently, people participating in recreational activities near the Airport may perceive aircraft noise as a nuisance to their enjoyment or participation in an activity. Unfortunately, insulation is not available for outdoor activities to soften or lessen the noises created by aircraft. These types of land uses should be discouraged in proximity to the Airport or within approach and departure areas because mitigation strategies for noise impacts are limited.

## • Concentration of People (density)

The number of people participating in a specific recreational activity or at a specific geographic area can vary. A large community park may have several playground, picnic, and activity areas. On a weekend or during warm weather months, park activities and usage can increase. Consequently, park activities or recreational uses that attract a significant concentration of people should be discouraged in proximity to the Airport. Land uses such as racetracks, casinos, and sports parks also accommodate large numbers of people. The frequency of use can vary depending on the size of the venue. Many times other programs or events will take place at these facilities throughout the year, and consequently their compatibility becomes a concern. Local review by the City of La Crosse and local municipalities of potential concerns related to density should be conducted for park and recreational activities within the vicinity of the Airport.

#### Tall Structures

Parks and recreational land uses may include extensive lighting and the incorporation of tall structures such as press boxes, light poles, and scoreboards. These land uses often have marketing activities such as tethered balloons and overflights during events, which can affect navigable airspace. In such instances, the height of objects and associated buildings should be evaluated according to FAR Part 77 *Surface* requirements for potential impacts to navigable airspace in the Airport's environs.

# Visual Obstructions

Land uses within this classification often have numerous high intensity lights that illuminate large areas, such as playing fields or parking lots, which create emissions that can result in night blindness for aircraft pilots. Water bodies incorporated within a recreational area may create glare that can produce a visibility concern for pilots. If numerous bright lights are located in proximity to the Airport or aircraft traffic pattern, they may affect a pilot's ability to see the Airport or operate the aircraft. Specific review of

emission and glare-related concerns should be conducted when assessing possible impacts with park and recreational uses.

#### • Wildlife and Bird Attractants

Parks and recreational activities attract wildlife and birds because they combine food and shelter in one geographic area. A typical city park has a variety of trees and shrubs that provide excellent shelter for birds and small mammals. Additionally, food sources are usually prevalent from people feeding animals and birds or from open trash receptacles that contain discarded food material.

Golf courses provide areas of open space and a limited number of people, which creates an acceptable environment for wildlife. As a general rule, golf courses are considered incompatible land uses due to the concerns related to wildlife attractants. However, golf courses may be a compatible land use within the vicinity of the Airport if they are managed correctly to avoid significant wildlife attractants. Water hazards attract waterfowl, such as geese and gulls, while manicured turf provides a food source for birds and rodents. Raptors (e.g. hawks, owls, falcons) can also be attracted to the golf course environment as they prey on small rodents that feed in the area. All of these forms of wildlife can be detrimental to aircraft operations during approach and departure. Recreational areas that provide shelter and/or food sources for wildlife and birds should be discouraged from the environs near airports to reduce the potential for wildlife strikes. Coordination with the FAA is essential prior to approval of these types of land uses.

Wildlife typically look for areas that provide nesting, roosting, or feeding opportunities. Racetracks and sports arenas usually offer all of these elements, making them attractive to wildlife and birds. If not managed properly, food remains that are dropped or discarded by spectators and vendors lure birds and rodents to the area to feed. These land uses typically have water detention ponds that support storm water runoff from the facility. Open water bodies provide nesting and roosting habitats for the wildlife and birds. Light poles and structures also provide roosting habitats for larger bodied birds such as raptors, which prey on smaller birds and mammals attracted to food debris. Larger birds can pose a safety concern when they fly at higher altitudes, which can interfere with aircraft flight paths and cause significant damage to aircraft. Local government should attach management conditions to development approvals within a three (3)- to five (5)--mile radius of the Airport so the potential to attract wildlife and birds is minimized.

| La Crosse Municipal Airport Land Use Compatibility Chart  |                      |                         |                    |                                     |                                     |  |  |
|---|----------------------|-------------------------|--------------------|-------------------------------------|-------------------------------------|--|--|
|   | I=Impact             | P=Possible Impa         | act N=No Imp       | act                                 |                                     |  |  |
| Land Uses <sup>1</sup>  | Noise<br>Sensitivity | Concentration of People | Tall<br>Structures | Visual<br>Obstructions <sup>2</sup> | Wildlife and<br>Bird<br>Attractants |  |  |
|   | Parl                 | ks and Recreation       | n Activities       |                                     |                                     |  |  |
| Casino  | N                    | I.                      | Р                  | 1                                   | I.                                  |  |  |
| Commercial Recreational<br>Uses<br>Indoor or Outdoor<br>(e.g. physical fitness center,<br>bowling alley, skating rink,<br>indoor theater, campground,<br>tennis/swimming facility, drive-<br>in theater, skating rink,<br>amphitheater) | Ρ                    | I                       | Ρ                  | I                                   | Ρ                                   |  |  |
| Parks<br>(e.g. aquatic, mini, private,<br>sports, neighborhood, school,<br>community)   | I                    | Ρ                       | I                  | Ρ                                   | Ρ                                   |  |  |
| Specialty Uses<br>(e.g. amusement or theme<br>park, fairground, racetrack,<br>sports arena)   | I                    | I                       | I                  | 1                                   | 1                                   |  |  |

# Table 2-8 Land Use Compatibility Chart for Parks and Recreation Activities

<sup>&</sup>lt;sup>1</sup> The following information is not an all-inclusive list; however it provides guidance through listing a sample of land uses under each individual land use classification.

 $<sup>^2</sup>$  It should be noted that any land use containing a parking lot should be classified as a possible impact (P) due to the lighting issues associated with visual obstructions.

# **Chapter 3**

# **Airport Overlay Zones**

# 3.1 Land Use Compatibility Zones

It is critical to maintain safe operational environments on airport property and within the communities surrounding the La Crosse Municipal Airport. As outlined previously in Chapter 2, one of the primary factors in determining land use compatibility often relates to the proximity of a specific land use to the Airport, more specifically to the runways. It is necessary to designate the types of land uses within specific geographic areas, or zones that surround the La Crosse Municipal Airport as either:

- Permitted
- Permit required
- Not permitted

The land uses illustrated in this document do not represent an inclusive list, but rather are intended to provide a general understanding of the types of land uses that typically surround the Airport. If individual land use requests arise that are not included in this document, the governing municipality should apply the general concepts outlined within this document to evaluate compatibility on a case-by-case basis. Some interpretation by a municipality may be necessary to address the specific needs within the community.

# 3.2 Basis for Land Use Zones

The two primary sources of information that were referenced to develop the land use compatibility zones for the La Crosse Municipal Airport include the Federal Aviation Administration (FAA) Advisory Circular (AC) 150-5300-13, Change 14, *Airport Design*, specifically Runway Protection Zones (RPZs) and Federal Aviation Regulation (FAR) Part 77, *Objects Affecting Navigable Airspace*, commonly known as the FAR Part 77 Surfaces.

# 3.2.a. Runway Protection Zones

Runway protection zones are intended to protect people and property on the ground in proximity to the Airport. RPZs are located at the end of each runway and should ideally be controlled by the La Crosse Municipal Airport. Control is preferably exercised by acquisition of sufficient property to achieve and maintain an area that is clear of all incompatible land uses, objects, and activities.

The RPZ is trapezoidal in shape and centered on the extended runway centerline. Dimensions for a particular RPZ are based on the type of aircraft and approach visibility minimums associated with that particular runway end. Unless noted by a special circumstance, the RPZ begins two hundred (200) feet beyond the end of the runway and has specific land use restrictions to keep the approach and departure areas clear of obstructions. The RPZ has two (2) specific areas; the central portion of the RPZ, which is equal in width to the runway Object Free Area (OFA), and the

controlled activity area, which is adjacent to the central portion of the RPZ. **Table 3-1** provides dimensional information for the various RPZ sizes and **Figure 3-1** graphically represents an RPZ.

|   |                                       | Dimensions                   |                                    |  |              |  |
|---|---------------------------------------|------------------------------|------------------------------------|--|--------------|--|
| Approach Visibility<br>Minimums <sup>1</sup>    | Facilities Expected<br>to Serve       | Length<br>L feet<br>(meters) | Inner Width<br>W1 feet<br>(meters) | Outer Width<br>W <sub>2</sub> feet<br>(meters) | RPZ<br>acres |  |
|   | Small Aircraft<br>(exclusively)       | 1,000<br>(300)               | 250<br>(75)                        | 450<br>(135)                                   | 8.035        |  |
| Visual and<br>not lower than<br>1-mile (1,600m) | Aircraft Approach<br>Categories A & B | 1,000<br>(300)               | 500<br>(150)                       | 700<br>(210)                                   | 13.770       |  |
|   | Aircraft Approach<br>Categories C & D | 1,700<br>(510)               | 500<br>(150)                       | 1,010<br>(303)                                 | 29.465       |  |
| Not lower than<br><sup>3</sup> ⁄4-mile (1,200m) | All Aircraft                          | 1,700<br>(510)               | 1,000<br>(300)                     | 1,510<br>(453)                                 | 48.978       |  |
| Lower than<br>¾-mile (1,200m)                   | All Aircraft                          | 2,500<br>(750)               | 1,000<br>(300)                     | 1,750<br>(525)                                 | 78.914       |  |

 Table 3-1
 Runway Protection Zone Dimensional Requirements

<u>1</u> The RPZ dimensional standards are for the runway end with the specified approach visibility minimums. The departure RPZ dimensional standards are equal to or less than the approach RPZ dimensional standards. When an RPZ begins other than 200 feet (60m) beyond the runway end, separate approach and departure RPZs should be provided. Refer to FAA AC 150/5300-13, Change 14, Appendix 14 for approach and departure RPZs. Source: FAA AC 150/5300-13, Change 14, Airport Design Standards



# Figure 3-1 Runway Protection Zone Diagram

Source: FAA AC 150/5300-13, Change 14, Airport Design Standards

In addition to the general clearing requirements associated with the OFA and RPZs, they each have land use related criteria that must be maintained. It is desirable to clear all objects from the RPZ, per the criteria noted in FAA AC 150/5300-13 Change 14, *Airport Design*, although some uses are permitted, provided they do not attract wildlife, do not interfere with navigation aids, and are located outside the runway Object Free Area. For example, automobile parking facilities are discouraged; however, they can be permitted provided lighting, as well as the lots themselves, are located outside the central portion of the RPZ and meet the aforementioned three (3) criteria.

Land uses that are prohibited from the RPZ areas, according to FAA AC 150/5300-13 Change 14, *Airport Design*, include:

- Fuel storage facilities.
- Residential structures, including homes, condominiums, apartments, and manufactured housing parks.
- Public assembly facilities such as places of worship, schools, hospitals, office buildings, shopping centers, or other uses with similar concentrations of people.

If it is impracticable for the airport sponsor to acquire and plan the land uses within the entire RPZ, land use standards can provide a recommendation status for that portion of the RPZ that is not controlled by the airport sponsor. If this option is impractical, the airport sponsor should consider the acquisition of an avigation easement to provide control over the RPZ area.

# 3.2.b. FAR Part 77 Surfaces

Although the FAA can determine if structures are obstructions to air navigation, the FAA is not authorized to regulate land use. Under FAR Part 77 Surfaces, an aeronautical study is undertaken by the FAA to determine whether a structure would be a hazard to navigable air space. However, there is no specific authorization in any statute that permits the FAA to limit land use decisions. Therefore, in every aeronautical study determination, the FAA acknowledges that state or local authorities control the appropriate use of property beneath an airport's airspace.

The FAA evaluates height concerns within five (5) different surfaces. Each of these surfaces is discussed below to illustrate their geographic limits, as well as their relationship to the Airport's environs.

• **Primary Surface** must be clear of all obstructions except those fixed by their function, such as runway edge lights, navigational aids, or airport signage. The primary surface is owned and controlled by the La Crosse Municipal Airport and is not included as a land use zone. The surface functions as an important safety area since it is longitudinally centered on a runway and is intended to provide an OFA around the runway surface. When a runway has a prepared hard surface, such as those at the Airport, the primary surface will extend two hundred (200) feet beyond each individual runway end.

At the La Crosse Municipal Airport, the following primary surfaces are applied:

- Runway 03/21 1,000 feet 0
- Runway 13/31 1,000 feet 0
- Runway 18/36 1,000 feet 0

Table 3-2, Figure 3-2, and Figure 3-3 depict various dimensional requirements for the primary surface and other FAR Part 77 Surfaces. A visual approach runway has relatively small surfaces, with approach and horizontal surfaces extending five thousand (5,000) feet from the primary surface at an approach slope of twenty feet horizontally for each one foot vertically (20:1). For a non-precision approach runway, both the approach and horizontal surfaces extend either five thousand (5,000) or ten thousand (10,000) feet from the primary surface, depending on the design category of the runway. The approach surfaces for precision approach runways are similar to those for non-precision approach runways, except that the approach surface extends fifty thousand (50,000) feet from the primary surface and the horizontal surface extends ten thousand (10,000) feet from the primary surface.

The existing approaches at the Airport consist of visual, non-precision, and precision at the current time. However, as technology changes, it is anticipated that all runways will eventually be equipped with precision GPS approaches in the future. Therefore, a PIR designation has been given to each runway to protect the 50:1 approaches into each runway at the Airport which are needed to support GPS approaches. This expanded approach area has been utilized in the development of the land use zones which are discussed in greater detail later in the Chapter.

| Runways | Runway Length<br>(feet) | Runway Width<br>(feet) | Existing<br>FAR Part 77<br>Classifications | Future<br>FAR Part 77<br>Classifications |  |  |
|---------|-------------------------|------------------------|--|--|--|--|
| 03      | E 100                   | 150                    | B(V)                                       | PIR                                      |  |  |
| 21      | 5,199                   | 150                    | B(V)                                       | PIR                                      |  |  |
| 13      | C 050                   | 150                    | С  | PIR                                      |  |  |
| 31      | 6,050                   | 150                    | B(V)                                       | PIR                                      |  |  |
| 18      | 0 740                   | 150                    | PIR  | PIR                                      |  |  |
| 36      | 0,742                   | 150                    | С  | PIR                                      |  |  |
|         |                         |                        |  |  |  |  |

|  | Table 3-2 La Crosse Munici | pal Airport Runway | / Information |
|--|----------------------------|--------------------|---------------|
|--|----------------------------|--------------------|---------------|

C - Non-precision Approach B(V) - Visual Approach

PIR - Precision instrument runway - The runway has an existing instrument approach procedure that utilizes an Instrument Landing System (ILS) or a Precision Approach Radar (PAR).

Source: FAR Part 77 Object Affecting Navigable Airspace





Source: FAR Part 77 Object Affecting Navigable Airspace



#### Figure 3-3 FAR Part 77 Surfaces – 3D Isometric View of Section A

Source: FAR Part 77 Object Affecting Navigable Airspace

- **Transitional Surface** extends outward and upward at right angles to the runway centerline and at a slope of seven feet horizontally for each one-foot vertically (7:1) from the sides of the primary and approach surfaces. The transitional surfaces extend to the point at which they intercept the horizontal surface at a height of one hundred fifty (150) feet above the established airport elevation. For precision approach surfaces that project through and beyond the limits of the conical surface, the transitional surface also extends five thousand feet (5,000') horizontally from the edge of the approach surface and at right angles to the runway centerline. **Table 3-2, Figure 3-2,** and **Figure 3-3** depict the dimensional requirements of the transitional surface.
- Horizontal Surface is a horizontal plane located one hundred fifty 150 feet above the established airport elevation encompasses an area from the transitional surface to the conical surface. The perimeter is constructed by generating arcs from the center of each end of the primary surface and connecting the adjacent arcs by lines tangent to those arcs. The radius of each arc for all runway ends designated as utility or visual is five thousand (5,000) feet or ten thousand (10,000) feet for precision and non-precision runway ends. Table 3-2, Figure 3-2, and Figure 3-3 depict the dimensional requirements of the horizontal surface.
- **Conical Surface** extends upward and outward from the periphery of the horizontal surface at a slope of twenty feet horizontally for each one-foot vertically (20:1) for a horizontal distance of four thousand (4,000) feet. Height limitations for the surface range from one hundred fifty (150) feet above the established airport elevation at the inner edge to three hundred fifty (350) feet at the outer edge. **Table 3-2, Figure 3-2,** and **Figure 3-3** depict the dimensional requirements of the conical surface.
- **Approach Surface** is longitudinally centered on the extended runway centerline and extends outward and upward from the end of the primary surface. The approach slope is a ratio of 20:1, 34:1, or 50:1, depending on the runway approach type. The length of the approach surface depends on the approach type as well and varies from five thousand (5,000) to fifty thousand (50,000) feet. The inner edge of the approach surface is the same width as the primary surface and expands uniformly to a width ranging from one thousand two hundred fifty (1,250) feet to sixteen thousand (16,000) feet, again depending on the type of runway and approach. **Table 3-2, Figure 3-2,** and **Figure 3-3** depict the dimensional requirements of the approach surface.

# 3.2.c. Summary of Basis for Land Use Zones

The surfaces outlined in the previous sections are utilized by the FAA to evaluate height concerns (FAR Part 77 Surfaces) and limit incompatible land uses in the areas closest to the runway ends (RPZs). These surfaces and areas can be utilized as the basis for land use decisions and dimensional guidance for the creation of land use compatibility zones because they are governed and evaluated by the FAA.

# 3.3 La Crosse Municipal Airport Overlay Zones

FAR Part 77 Surfaces and RPZs have been combined to establish six (6) airport overlay zones (A, B1, B2, B3, C, and D), as illustrated in **Figure 3-4**, in order to promote and maintain compatible land use around the Airport. These zones cover a three (3)-mile radius from the Airport property line, which is regulated by Wisconsin State Statute, and encompasses portions of six (6) municipalities in Wisconsin, and three municipalities in Minnesota as noted in Chapter 1. **Table 3-3** illustrates the six (6) zones and their source of development and **Figure 3-5** illustrates the zones position around the Airport runways.

| Zone | Description                  | Source                                     |  |
|------|------------------------------|--|--|
| Α    | Runway Protection Zone (RPZ) | AC 150/5300-14,<br>Airport Design          |  |
| B1   | Approach Surface (inner)     | FAR Part 77                                |  |
| B2   | Approach Surface (middle)    | FAR Part 77                                |  |
| В3   | Approach Surface (outer)     | FAR Part 77                                |  |
| С    | Transitional Surface         | FAR Part 77                                |  |
| D    | 3-Mile Zoning Radius         | FAR Part 77 and<br>Wisconsin State Statute |  |

#### Table 3-3 Land Use Overlay Zones

Source: Mead & Hunt

Each zone is discussed on the following pages to explain its function, its dimensions, and the various compatible land uses within each zone.

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[Insert La Crosse Municipal Airport Airport Overlay Zones Figure 3-4

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Figure 3-5 La Crosse Municipal Airport Overlay Zones

# 3.3.a. Zone A – Runway Protection Zone (RPZ)

Zone A is intended to provide a clear area that is free of above ground obstructions and structures. This zone is closest to the individual runway ends. The dimensional standards for this zone are the same as those described in FAA AC 150/5300-13, Change 14, *Airport Design Standards*, and are illustrated in **Table 3-4** and **Figure 3-6**.

Land uses within Zone A should be limited, where possible. The Airport has residential structures within Zone A and they should be removed when financially feasible. Construction of new structures should be prohibited, while existing structures and vegetation should be removed through the use of land acquisition and/or the purchase of avigation easements, when practical.

# **Table 3-4 Zone A Dimensional Requirements**

|                 | Approach Visibility<br>Minimums <sup>1</sup> | Dimensions                   |                                    |  |              |
|-----------------|--|------------------------------|------------------------------------|--|--------------|
| Runway Ends     |  | Length<br>L feet<br>(meters) | Inner Width<br>W1 feet<br>(meters) | Outer Width<br>W <sub>2</sub> feet<br>(meters) | RPZ<br>acres |
| All Runway Ends | Lower than ¾-mile (1,200m), all aircraft     | 2,500<br>(750)               | 1,000<br>(300)                     | 1,750<br>(525)                                 | 78.914       |

<u>1</u> The RPZ dimensional standards are for the runway end with the specified approach visibility minimums. The departure RPZ dimensional standards are equal to or less than the approach RPZ dimensional standards. When an RPZ begins other than 200 feet (60m) beyond the runway end, separate approach and departure RPZs should be provided. Refer to FAA AC 150/5300-13, Change 14, Appendix 14 for approach and departure RPZs.

Source: FAA AC 150/5300-13, Change 14, Airport Design Standards

# Figure 3-6 Zone A (Runway Protection Zone) Diagram



Source: FAA AC 150/5300-13, Change 14, Airport Design Standards

# 3.3.b. Zone B1, B2, and B3 – Approach Surface

Zone B1, B2, and B3 are critical overlay zoning surfaces that reflect the approach and departure areas for each runway at La Crosse Municipal Airport. The size of Zone B is the combination of Zone B1, B2, and B3 and is based on a precision approach (50:1) as discussed earlier. **Table 3-5**, **Figure 3-7**, and **Figure 3-7** illustrate the size of Zone B1, B2, and B3 based upon FAR Part 77 *Surface* dimensions. A portion of Zone B1 is superseded by Zone A because the approach surface and RPZ overlap for the entire length of the RPZ. Consequently the length of Zone B1 begins at the outer edge of the RPZ. The length of B1 is 3,750 feet beyond Zone A, located at the outer limit. Zone B2 is also equal 3,750 feet, beyond Zone B1, located at the outer edge of the zone.

Land uses within Zone B1, B2, and B3 typically require a permit to maintain compliance with land use guidelines that limit concentrations of people, wildlife attractants, visual obstructions, tall structures, and noise sensitive developments. For example, residential developments should be discouraged within this area. However, some single family developments, if low in density, may be allowable with a permit, should it be determined that the proposed development or land use does not conflict with the five (5) primary areas of interest identified in Chapter 2 of this plan.

| Dimensions<br>in Figure 3-8 | Item  | Runway Dimensional Standards |  |
|-----------------------------|---|------------------------------|--|
| А                           | Primary surface width and <b>Zone A</b> inner width | 1,000'                       |  |
| В                           | Zone B1 inner width                                 | 1,750'                       |  |
| С                           | Zone B2 inner width                                 | 2,875'                       |  |
| D                           | Zone B3 inner width                                 | 4,000'                       |  |
| E                           | Zone C width  | 1,050'                       |  |
| F                           | Zone A length                                       | 2,000'                       |  |
| G                           | Zone B1 length                                      | 3,750'                       |  |
| Н                           | <b>Zone B2</b> length 3,750'                        |                              |  |
| I                           | Zone B3 length Varies*                              |                              |  |

Table 3-5 Airport Overlay Zones B1, B2, B3, C, and D Dimensional Standards

\* The length and outer width of Zone B3 varies due to its proximity to Zone D and the angle at which it intersects the outer edge of Zone D, which is the 3-mile buffer from the Airport property boundary. Source: Mead & Hunt





\* The length (9) and outer width of Zone B3 varies based upon the proximity and angle at which Zone B3 intersects Zone D, which is the 3-mile jurisdictional boundary from Airport property. Source: Mead & Hunt

# 3.3.c. Zone C – Transitional Surface

The areas within Zone C extend one thousand fifty (1,050) feet outward from the edge of the primary surface and parallel the runway and extended runway centerline with Zone B1, to a length equal to the outer edge of Zone A and then squared the meet Zone A. **Table 3-5** and **Figure 3-5** illustrate the specific dimensions for Zone C, which is based upon the runway primary surface.

The area encompassed by Zone C is in proximity to the runway environs and should be relatively free of airspace obstructions. It is essentially the space between the runway and the area where a standard airport traffic pattern is located. An airport traffic pattern is a rectangular circuit that aircraft fly while waiting for clearance to land. The specific size of an airport traffic pattern varies depending upon the size of the aircraft utilizing the Airport. Aircraft incidents, such as engine out or aircraft stalls during approach or departure, can take place in Zone C. Therefore, allowable land uses should not draw a concentration of people, generate visual obstructions, attract wildlife hazards, or create tall structures. Noise sensitive developments should also be discouraged because this area will experience engine-run-up noise and general operational noise from the aircraft during approach and departure.

# 3.3.d. Zone D – Three (3)-Mile Jurisdictional Boundary

Zone D represents the three (3)-mile jurisdictional boundary of the Airport, as provided for within the Wisconsin Statues, which is calculated by connecting the intersections of three (3)-mile arcs drawn from the Airport property boundary. The Zone encompasses the majority of the horizontal surface (innermost area) and the conical surface (outermost area) of the FAR Part 77 Surfaces. **Figure 3-5** illustrates the limits of Zone D.

The innermost area of Zone D has a substantial number of aircraft overflights during approach or departure at the La Crosse Municipal Airport. This area should be clear of all uses that may generate visual obstructions, wildlife attractants, natural vegetation, and tall structures or objects because aircraft typically operate at lower altitudes and slower air speeds in this area.

The outermost area of Zone D has the least number of land use restriction considerations. Many land uses within Zone D can be compatible with Airport environs; however, appropriate consideration should be given to evaluate uses that may pose a hazard related to the five (5) primary areas of interest. For example, if a pilot is distracted by visual obstructions, potential safety concerns can arise. Land uses that encourage any of the aforementioned conditions should be discouraged. Noise sensitive developments should also be limited. Due to the proximity to the runway end, these areas are not likely impacted by a noise level above the sixty-five (65) dB DNL that are the FAA and Department of Housing and Urban Development (HUD) benchmarks. Consequently, the impact from noise in these areas is typically a perceived impact by persons on the ground compared to an impact that is defined as a higher noise level. Little can be done to mitigate noise impacts for the property owner within this Zone.

# 3.3.e. Airport Height Zoning District

The La Crosse Municipal Airport Height Zoning Ordinance was originally drafted and adopted in 1960, and the official map was adopted in November, 2008. As a part of the *Airport Overlay Zoning District (AOZD) Ordinance*, the original height ordinance found in Chapter 13 of the La Crosse Municipal Code has been combined with the additional zoning districts, to create one comprehensive zoning ordinance. The La Crosse Municipal Airport Height Zoning District as defined in the *AOZD Ordinance* encompasses all of the FAR Part 77 Surfaces previously mentioned and limits the allowable height of buildings, structures, objects, and vegetation within the AOZD and FAR Part 77 Surface areas, which includes the approach, departure, and overflight areas. These areas should remain free of obstructions and provide a safe environment for aircraft operations.

The permitted height shall not exceed the height limitation numbers shown in **Figure 3-8**. The *Airport Height Zoning Map* depicts an elevation (mean sea level) within each rectangular cell. The elevation represents the maximum allowable height for any buildings, structures, objects, or vegetation within that cell. To determine the allowable height within a specific cell or at a specific location, one should subtract the existing ground elevation at the proposed site from the allowable elevation shown within the appropriate cell on the *Airport Height Zoning Map*. The difference between these two numbers provides the allowable height for any buildings, structures, objects, or vegetation at that location.

[Insert La Crosse Municipal Airport Height Zoning Map Here Figure 3-8]
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### 3.4 Zoning District Use Restrictions

**Figure 3-9** illustrates the airport overlay zones as outlined in the previous section. An assessment of specific land uses and their compatibility relative to the various zones is shown in **Table 3-6** through **Table 3-12** include specific land uses and their compatibility relative to the various zones described in this document. Each land use has been determined as permitted, permit required, or not permitted to clearly assess the level of compatibility with Airport environs. These three (3) designations are discussed on the following pages to highlight the specifics of each classification.

Land uses may be considered compatible or permitted in some areas while incompatible in others. Instead of considering land uses as incompatible or not permitted within an entire zoning district, it is recommended that additional review through a permit process be considered. Community planners, elected officials, and building officials can adjust developments within specific zoning districts to better meet land use compatibility.

As with traditional zoning, it is difficult to create a definitive geographic line between various land uses. More often, specific physical boundaries, such as roads or streams, are used to separate varying land uses, which can create vague differentiation of land use types. This is also the case with airport overlay zones since the zones follow specific dimensional criteria and a particular parcel may be impacted by more then one zone. This can create inconsistencies within a parcel when a land use is permitted on one side of a line, but requires a permit on the opposite side. Such 'transitional areas' are a product of the location of the geographic end of the runway relative to proposed land use. A permit may be necessary in these transitional areas. For example, a proposed land use could be located a greater distance from the Airport's operational area or a development could be shifted to a compatibility, such as down shielded lighting, lower building heights, underground detention ponds, detention ponds with reduced surface area, and detention ponds that drain within forty-eight (48) hours.

Other mitigation tools to assist local planners, elected officials, and building officials are outlined within the *Wisconsin Airport Land Use Guidebook*. An additional recommendation could be to create a planned unit development (PUD) zoning designation to allow greater flexibility for land use compatibility for the neighboring municipalities and the property owner/applicant/developer. Suggestions within the PUD could include allowing for higher concentrations of people per acre within a low density or restricted area. However, conditions should be placed on the developer to site the proposed project away from the La Crosse Municipal Airport's operational areas and to provide ample green space for greater safety within the given zoning district.

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[Insert La Crosse Municipal Airport Overlay Zoning District with Dimensions Here Figure 3-9]

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#### 3.4.a. Existing Land Uses

Existing land uses require different compatibility considerations than future land uses. If an existing land use falls within a zone that deems it incompatible or not permitted based on the implementation of *La Crosse Municipal Airport Land Use Plan & AOZD Ordinance*, it is not suggested that the land use be relocated or that property values be diminished due to the location in relation to Airport. However, it is recommended that a permit review be given to any expansion or redevelopment of the property. Primary areas of interest discussed in Chapter 2 of this document need to be applied to the existing land use when redevelopment or expansion of that development is proposed. Compatibility guidelines should be utilized during the site plan review process to limit or minimize the following issues:

- Concentrations of people (density)
- Noise sensitivity
- Tall structures
- Visual Obstructions
- Wildlife and bird attractants

For example, if an existing office building applies for an expansion in a zoning district where this type of land use is not permitted or is incompatible, the local municipality should properly mitigate the development to meet compatibility criteria. It is not the intent of the Airport Overlay Zoning District to prevent the expansion; however, the application of compatibility criteria should be utilized to limit or minimize the five (5) concerns listed above.

#### 3.4.b. Permitted Land Uses

A land use that is generally considered to be compatible, or a permitted use, within a particular zone is designated with the letter '**P**'. Compatible land uses are not expected to be hazardous to airport and aircraft operations and are reasonably safe for persons on the ground within proximity of the Airport. A land use may be considered compatible with Airport environs if it:

- Will not attract concentrations of people (density)
- Will not exceed height standards
- Will not cause a visual distraction
- Will not cause a source of smoke/steam
- Will not cause an electrical, navigational, or radio interference
- Will not create wildlife and bird attractants
- Will not create large area of standing water
- Will not create storage of flammable substances or materials
- Will not create a pilot to have difficulties distinguishing the airport from the surroundings
- Will not exceed compatible DNL noise levels of 65 DNL or greater

For example, when water bodies, such as the Mississippi River, are managed properly they can be a compatible land use near the Airport environs. During periods of migration, hundreds of birds flock to the area, which can pose a temporary hazard to pilots in the area. Consequently, the La Crosse Municipal Airport can issue a Notice to Airmen (NOTAM) to inform pilots of the potential for wildlife and bird hazards during migration periods.

#### 3.4.c. Permit Required Land Uses

Land uses that may be permissible if certain conditions are met or applied through a permit process are noted as **'R'**. This designation builds in flexibility for the City of La Crosse and the nine surrounding municipalities (six in Wisconsin, three in Minnesota) to allow for growth and development to provide compatible land uses within the jurisdictional boundary of the La Crosse Municipal Airport. This designation may allow a marginally accepted land use to be located within a specific zone after review has been completed to identify the best site location and a permit has been issued, while accounting for the safe operations at La Crosse Municipal Airport. Such a review will be conducted by the appropriate department in the surrounding municipalities.

For example, a manufacturing company may propose a plant within the vicinity of the Airport and has acknowledged that the plant will produce smoke and steam. Under the **'R'** designation, the local community would have several options. Local planners may work with the developer to reduce potential impacts associated with the smoke/steam issue by changing the location of the plant, changing the height of the emission stacks, or even changing manufacturing techniques. If these actions result in appropriate measures to reduce incompatibility, the local community may approve the use. If this exercise can not limit the concern, the local community may determine the use is incompatible and deny the use. This sort of assessment should be done with an understanding that specific criteria, as outlined within the compatible designation, as well as the *AOZD Ordinance*, should provide the basis for decision making.

The intent of the **'R'** designation is to evaluate the proposed use and identify areas where alterations or mitigations could be utilized to minimize potential impacts to five specific areas of concern. The **'R'** designation is not intended to necessarily preclude development within the specific zone, but rather to provide an opportunity for the governing agency to evaluate these mitigation and alternation options and offer guidance for development concerns.

#### 3.4.d. Not Permitted Land Uses

Land uses considered not compatible, or not permitted, within a specific zone are identified as **'N'**. These land uses can endanger the health, safety, and welfare of those persons on the ground in proximity to the Airport, as well as the aircraft, crew, and passengers. For example, multi-family residential structures should not be located on or near the Airport property due to concentrations of people, as well as the possible height concerns associated with tall structures, such as apartment buildings or condominiums.

#### Table 3-6 – Residential Activities

| Future Land Use Compatibility Chart   |             |                                    |  |         |        |        |  |
|---|-------------|------------------------------------|--|---------|--------|--------|--|
| Р   | = Permitted | <b>R</b> = Permit <b>R</b> equired | $\mathbf{N} = \mathbf{N} \text{ot Period}$ | rmitted |        |        |  |
| Land Uses <sup>123</sup>  | Zone A      | Zone B1                            | Zone B2                                    | Zone B3 | Zone C | Zone D |  |
|   |             | <b>Residential Activ</b>           | rities                                     |         |        |        |  |
| Single-Family Uses (1 unit per lot)   | N           | R                                  | R  | Р       | N      | Р      |  |
| Multi-Family Uses<br>(Three or more principal dwelling units within a single building on the same parcel)<br>(e.g. apartment, condominium, townhouse-style) |             |                                    |  |         |        |        |  |
| Low-Rise (2 to 3 Levels) or Mid-Rise (4-12 Levels)  | N           | R                                  | R  | Р       | N      | Р      |  |
| High-Rise (13+ Levels)  | Ν           | Ν                                  | R  | Р       | Ν      | Р      |  |
| Group Living Uses<br>(e.g. assisted living, group care, independent group living, nursing and convalescent home)  |             |                                    |  |         |        |        |  |
| Residential Group Living Units<br>(1 dwelling per lot)  | Ν           | R                                  | R  | Р       | Ν      | Р      |  |
| Low-Rise (2 to 3 Levels) or Mid-Rise (4-12 Levels)  | N           | R                                  | R  | Р       | N      | Р      |  |
| High-Rise (13+ Levels)  | N           | N                                  | R  | Р       | N      | Р      |  |
| Manufactured Housing Parks  | N           | N                                  | R  | Р       | N      | P      |  |

<sup>&</sup>lt;sup>1</sup> The following information is not an all-inclusive list; however it provides a sample of the types of land uses under each individual land use classification. <sup>2</sup> Height limitations set forth in Chapter 15.19 of the La Crosse Municipal Code supersede any land use criteria and must be followed first when determining compatibility of development.

<sup>&</sup>lt;sup>3</sup> Any future residential development within Zone A or Zone C is allowed, but is limited to those lots currently zoned for residential use.

#### Table 3-7 – Commercial Activities

| Future Land Use Compatibility Chart  |               |                                    |             |         |        |        |  |  |  |
|--|---------------|------------------------------------|-------------|---------|--------|--------|--|--|--|
|  | P = Permitted | <b>R</b> = Permit <b>R</b> equired | N = Not Per | mitted  |        |        |  |  |  |
| Land Uses <sup>12</sup>  | Zone A        | Zone B1                            | Zone B2     | Zone B3 | Zone C | Zone D |  |  |  |
| Commercial Activities  |               |                                    |             |         |        |        |  |  |  |
| Eating and Drinking Establishments (e.g. restaurant, cafe, fast food restaurant, bar, nightclub)                                     | Ν             | R                                  | R           | Р       | Ν      | Р      |  |  |  |
| General Office/Medical Office/Dental Office Uses<br>(e.g. professional, business, financial, governmental)                           |               |                                    |             |         |        |        |  |  |  |
| Low-Rise (2 to 3 Levels)   | Ν             | R                                  | Р           | Р       | R      | Р      |  |  |  |
| Mid-Rise (4 to12 Levels)   | Ν             | N                                  | R           | Р       | Ν      | Р      |  |  |  |
| High-Rise (13+ Levels)   | Ν             | Ν                                  | R           | Р       | Ν      | Р      |  |  |  |
| Hospitality-Oriented<br>(e.g. hotel, motel, convention center, meeting hall, eve   | nt facility)  |                                    |             |         |        |        |  |  |  |
| Low-Rise (2 to 3 Levels)   | Ν             | R                                  | Р           | Р       | Ν      | Р      |  |  |  |
| Mid-Rise (4 to12 Levels)   | Ν             | Ν                                  | Р           | Р       | Ν      | Р      |  |  |  |
| High-Rise (13+ Levels)   | Ν             | N                                  | R           | Р       | Ν      | Р      |  |  |  |
| <b>Outdoor Storage and Display-Oriented</b> (e.g. lumber yard, vehicles sale, landscape sales, or farm supply equipment sale)        | N             | R                                  | Р           | Р       | R      | Р      |  |  |  |
| <b>Personal Service-Oriented</b><br>(e.g. retail service, banking facility, laundromat, dry<br>cleaning, beauty salon, funeral home) | Ν             | R                                  | Р           | Р       | R      | Р      |  |  |  |

<sup>&</sup>lt;sup>1</sup> The following information is not an all-inclusive list; however it provides a sample of the types of land uses under each individual land use classification. <sup>2</sup> Height limitations set forth in Chapter 15.19 of the La Crosse Municipal Code supersede any land use criteria and must be followed first when determining compatibility of development.

#### Table 3-7 – Commercial Activities (continued)

| Future Land Use Compatibility Chart   |        |                     |            |         |        |        |  |
|---|--------|---------------------|------------|---------|--------|--------|--|
| P = PermittedR = Permit RequiredN = Not Permitted   |        |                     |            |         |        |        |  |
| Land Uses <sup>12</sup>   | Zone A | Zone B1             | Zone B2    | Zone B3 | Zone C | Zone D |  |
|   | Comm   | ercial Activities ( | Continued) |         |        |        |  |
| Vehicle Servicing Uses<br>(e.g. full-serve gas station, unattended card key<br>service station, vehicle repair shop, tire sale) | Ν      | R                   | R          | Р       | Ν      | Р      |  |
| Retail Uses<br>(e.g. sale, lease, or rent of new or used products)  | -      |                     |            |         | •      |        |  |
| <i>Small Sales-Oriented</i><br>(e.g. convenience store, bakery, garden supply, grocery, hardware, or electronics store)         | Ν      | R                   | Р          | Р       | R      | Р      |  |
| Large Sales-Oriented<br>(e.g. big box store, mall, strip mall)  | Ν      | R                   | R          | Р       | R      | Р      |  |
| Surface Passenger Services<br>(e.g. passenger terminal for buses,<br>rail service, local taxi, limousine service)               | Ν      | R                   | Р          | Р       | R      | Р      |  |

<sup>&</sup>lt;sup>1</sup> The following information is not an all-inclusive list; however it provides a sample of the types of land uses under each individual land use classification. <sup>2</sup> Height limitations set forth in Chapter 15.19 of the La Crosse Municipal Code supersede any land use criteria and must be followed first when determining compatibility of development.

#### Table 3-8 – Industrial/Manufacturing Activities

| Future Land Use Compatibility Chart  |  |                    |              |         |        |        |  |  |
|--|--|--------------------|--------------|---------|--------|--------|--|--|
| P = PermittedR = Permit RequiredN = Not Permitted  |  |                    |              |         |        |        |  |  |
| Land Uses <sup>12</sup>  | Zone A   | Zone B1            | Zone B2      | Zone B3 | Zone C | Zone D |  |  |
|  | Industi  | rial/Manufacturing | g Activities |         |        |        |  |  |
| Industrial Service Uses<br>(e.g. machine shop, tool repair, towing/vehicle<br>storage, building supply yard, exterminator)               | N  | R                  | Р            | Р       | R      | Р      |  |  |
| Manufacturing and Production Uses<br>(e.g. manufacturing, processing, fabrication, packagir  | Manufacturing and Production Uses<br>(e.g. manufacturing, processing, fabrication, packaging or assembly of goods) |                    |              |         |        |        |  |  |
| General Manufacturing<br>(e.g. manufacturing, assembling or treatment of<br>most articles, materials, or merchandise)                    | N  | R                  | Р            | Р       | R      | Р      |  |  |
| Heavy Manufacturing<br>(e.g. concrete/asphalt plant, meat packing plant, wet<br>corn milling, paper mill, ethanol plant, animal feed)    | Ν  | Ν                  | R            | R       | Ν      | R      |  |  |
| Mining and Extraction Uses   | N  | Ν                  | N            | R       | N      | R      |  |  |
| Salvage Operations<br>(e.g. collect, store, and dismantle damaged or<br>discarded vehicles, machinery, appliances, building<br>material) | Ν  | R                  | R            | Р       | Ν      | Р      |  |  |
| Self-Service Storage Uses<br>(e.g. mini-warehouse, storage facility)   | N  | Р                  | Р            | Р       | R      | Р      |  |  |

<sup>&</sup>lt;sup>1</sup>The following information is not an all-inclusive list; however it provides a sample of the types of land uses under each individual land use classification. <sup>2</sup> Height limitations set forth in Chapter 15.19 of the La Crosse Municipal Code supersede any land use criteria and must be followed first when determining compatibility of development.

#### Table 3-8 – Industrial/Manufacturing Activities (continued)

| Future Land Use Compatibility Chart  |               |                   |                    |         |        |        |  |
|--|---------------|-------------------|--------------------|---------|--------|--------|--|
| P = Permitted R = Permit Required N = Not Permitted  |               |                   |                    |         |        |        |  |
| Land Uses <sup>12</sup>  | Zone A        | Zone B1           | Zone B2            | Zone B3 | Zone C | Zone D |  |
|  | Industrial/Ma | nufacturing Activ | vities (Continued) | )       |        |        |  |
| Warehouse/Freight Uses<br>(e.g. major wholesale distribution<br>center, freight storage, railroad switching yard)                                | Ν             | R                 | Р                  | Р       | R      | Р      |  |
| Waste-Related Uses<br>(e.g. recycling center, sanitary landfill, waste<br>transfer station, composting, sanitary or<br>water treatment facility) | Ν             | Ν                 | Ν                  | R       | Ν      | R      |  |
| Wholesale Sales Uses<br>(e.g. sale, lease, or rental of products<br>to retailers for industrial, institutional,<br>or commercial business users) | Ν             | R                 | Ρ                  | Ρ       | R      | Ρ      |  |

<sup>&</sup>lt;sup>1</sup> The following information is not an all-inclusive list; however it provides a sample of the types of land uses under each individual land use classification <sup>2</sup> Height limitations set forth in Chapter 15.19 of the La Crosse Municipal Code supersede any land use criteria and must be followed first when determining

compatibility of development.

#### Table 3-9 – Institutional Activities

| Future Land Use Compatibility Chart   |                   |                 |                  |         |        |        |  |  |
|---|-------------------|-----------------|------------------|---------|--------|--------|--|--|
| P = Permitte  | d <b>R</b> = Perm | nit Required    | N = Not Permitte | d       |        |        |  |  |
| Land Uses <sup>12</sup>   | Zone A            | Zone B1         | Zone B2          | Zone B3 | Zone C | Zone D |  |  |
|   | Institutio        | onal Activities |                  |         |        |        |  |  |
| <b>College and Universities</b> (e.g. public or private college or university, technical college, seminary)   | Ν                 | N               | R                | R       | N      | R      |  |  |
| General Community Service<br>(e.g. library, museum, transit center, senior/community center, police/fire/station)   | N                 | Ν               | R                | R       | R      | R      |  |  |
| Daycare Uses - (e.g. childcare center, adult daycare, preschool, after school program)  |                   |                 |                  |         |        |        |  |  |
| Residential Daycare Uses<br>(e.g. in-home adult/child daycare facility)   | Ν                 | R               | R                | Р       | Ν      | Р      |  |  |
| Institutional Daycare Uses<br>(e.g. childcare center, preschool,<br>after school program, adult daycare)  | Ν                 | Ν               | R                | R       | Ν      | R      |  |  |
| <b>Detention Facilities</b><br>(e.g. prison, jail, probation center, halfway house, juvenile detention home)  | Ν                 | Ν               | R                | R       | Ν      | R      |  |  |
| Educational Facilities  | -                 |                 | -                |         |        | -      |  |  |
| General Educational Facilities<br>(e.g. public and private elementary, middle, junior, and senior<br>high school including religious, boarding, military) | N                 | Ν               | R                | R       | Ν      | R      |  |  |
| <i>Specialized Education Facilities</i> (e.g. specialized trade, business, or commercial courses, non-degree granting school)                             | Ν                 | Ν               | R                | R       | R      | R      |  |  |
| Hospitals- (e.g. hospital and medical center)   | N                 | N               | R                | R       | N      | R      |  |  |
| Religious Assembly Uses<br>(e.g. church, temple, mosque, synagogue, eagles/moose/elk<br>lodge)  | Ν                 | Ν               | R                | R       | Ν      | R      |  |  |

<sup>&</sup>lt;sup>1</sup> The following information is not an all-inclusive list; however it provides a sample of the types of land uses under each individual land use classification. <sup>2</sup> Height limitations set forth in Chapter 15.19 of the La Crosse Municipal Code supersede any land use criteria and must be followed first when determining compatibility of development.

#### Table 3-10 – Infrastructure Activities

| La Crosse Municipal Airport Land Use Compatibility Chart  |             |                                    |             |         |        |        |  |
|---|-------------|------------------------------------|-------------|---------|--------|--------|--|
| P   | = Permitted | <b>R</b> = Permit <b>R</b> equired | N = Not Per | mitted  |        |        |  |
| Land Uses <sup>12</sup>   | Zone A      | Zone B1                            | Zone B2     | Zone B3 | Zone C | Zone D |  |
|   | Ir          | frastructure Acti                  | vities      |         |        |        |  |
| <b>Basic Utility Uses</b><br>(e.g. utility substation facility electrical substation, water and sewer lift station)               | Ν           | R                                  | R           | Р       | R      | Р      |  |
| <b>Communication Transmission Facility Uses</b><br>(e.g. broadcast, wireless, point to point, or<br>emergency tower and antennae) | Ν           | Ν                                  | R           | R       | Ν      | R      |  |
| Parking Uses<br>(e.g. ground lot, parking structure)  | R           | Р                                  | Р           | Р       | Р      | Р      |  |
| Transportation Uses<br>(e.g. local road, county road, highway, interstate)  | R           | Р                                  | Р           | Р       | Р      | Р      |  |
| Utility Uses<br>(e.g. wind generator, wind farm,<br>solar power generation equipment, water tower,<br>transmission lines)         | Ν           | R                                  | R           | Р       | Ν      | R      |  |

<sup>&</sup>lt;sup>1</sup> The following information is not an all-inclusive list; however it provides a sample of the types of land uses under each individual land use classification. <sup>2</sup> Height limitations set forth in Chapter 15.19 of the La Crosse Municipal Code supersede any land use criteria and must be followed first when determining compatibility of development.

#### Table 3-11 – Agriculture and Open Space Activities

| La Crosse Municipal Airport Land Use Compatibility Chart  |             |                     |               |         |        |        |  |  |
|---|-------------|---------------------|---------------|---------|--------|--------|--|--|
| P   | = Permitted | R = Permit Required | N = Not Pe    | rmitted |        |        |  |  |
| Land Uses <sup>12</sup>                                   | Zone A      | Zone B1             | Zone B2       | Zone B3 | Zone C | Zone D |  |  |
|   | Agricultu   | ire and Open Spa    | ce Activities |         |        |        |  |  |
| Agricultural Uses   |             |                     |               |         |        |        |  |  |
| (e.g. commercial cultivation of plants, livestock produce | ction)      |                     |               |         |        |        |  |  |
| Animal or Plant related                                   |             |                     |               |         |        |        |  |  |
| (e.g. livestock , dairy , horse farm, crop farming,       | R           | Р                   | Р             | Р       | Р      | Р      |  |  |
| vegetable, fruit, tree, wholesale plant nursery)          |             |                     |               |         |        |        |  |  |
| Facility-related  |             |                     |               |         |        |        |  |  |
| (e.g. fuel bulk storage or pumping facility, grain        | N           | N                   | R             | Р       | N      | Р      |  |  |
| elevator, or livestock, seed, grain sales)                |             |                     |               |         |        |        |  |  |
| Resident-related  |             | _                   | _             | _       |        | _      |  |  |
| (e.g. single-family home or mobile home if                | N           | R                   | R             | Р       | N      | Р      |  |  |
| converted to real property and taxed)                     |             |                     |               |         |        |        |  |  |
| Water Bodies Man-made resources                           |             | -                   |               | -       |        |        |  |  |
| (e.g. mining or extraction pond,                          | N           | К                   | К             | R       | N      | К      |  |  |
| wetland mitigation site)                                  |             |                     |               |         |        |        |  |  |
| Wildlife Preservation Areas                               |             |                     |               |         |        |        |  |  |
| (e.g. petting zoo, wildlife                               | N           | N                   | R             | R       | N      | R      |  |  |
| rehabilitation center, zoo, conservation areas)           |             |                     |               |         |        |        |  |  |

<sup>&</sup>lt;sup>1</sup> The following information is not an all-inclusive list; however it provides a sample of the types of land uses under each individual land use classification. <sup>2</sup> Height limitations set forth in Chapter 15.19 of the La Crosse Municipal Code supersede any land use criteria and must be followed first when determining compatibility of development.

#### Table 3-12 – Parks and Recreational Activities

| Future Land Use Compatibility Chart  |             |                     |              |         |        |        |  |
|--|-------------|---------------------|--------------|---------|--------|--------|--|
| P  | = Permitted | R = Permit Required | d N = Not Pe | rmitted |        |        |  |
| Land Uses <sup>12</sup>  | Zone A      | Zone B1             | Zone B2      | Zone B3 | Zone C | Zone D |  |
|  | Parks       | and Recreation      | Activities   |         |        |        |  |
| Casino   | N           | Ν                   | R            | R       | N      | R      |  |
| <b>Commercial Recreational Uses</b><br><i>Indoor or Outdoor</i><br>(e.g. physical fitness center, bowling alley, skating<br>rink, indoor theater, campground, tennis/swimming<br>facility, drive-in theater, skating rink, amphitheater) | Ν           | R                   | R            | R       | N      | R      |  |
| Parks<br>(e.g. aquatic, mini, private, sports, neighborhood,<br>school, community)   | Ν           | R                   | R            | R       | Ν      | R      |  |
| Specialty Uses<br>(e.g. amusement or theme park, fairground,<br>racetrack, sports arena)   | Ν           | Ν                   | R            | R       | Ν      | R      |  |

<sup>&</sup>lt;sup>1</sup> The following information is not an all-inclusive list; however it provides a sample of the types of land uses under each individual land use classification. <sup>2</sup> Height limitations set forth in Chapter 15.19 of the La Crosse Municipal Code supersede any land use criteria and must be followed first when determining compatibility of development.

## Chapter 4

## Implementation

## 4.1 Introduction

Airport zoning is intended to preserve and protect aviation and community infrastructure from the encroachment of incompatible land uses that can endanger the safety of aircraft, and airport operations, as well as affect the quality of life for citizens in proximity to the La Crosse Municipal Airport. The *Airport Overlay Zoning District* (AOZD) *Ordinance* is designed to assist the City of La Crosse and surrounding municipalities to protect the La Crosse Municipal Airport and its neighbors. The AOZD provides a legal mechanism to regulate local land use issues.

As noted in Chapter 2 of this document, the three (3)-mile zoning radius encompasses portions of six municipalities in Wisconsin, and three in Minnesota. While the AOZD will be adopted by municipalities within the state of Wisconsin, existing State statutes in Minnesota (360.201, 360.202, and 360.203) call for reciprocity regarding aeronautical projects which cross state boundaries. Therefore, it is a goal to obtain participation from the Town of La Crescent, the City of La Crescent, and the Town of Dresbach in supporting the continued safety of operations at the La Crosse Municipal Airport through the implementation of the AOZD.

## 4.2 Airport Overlay Zoning District Ordinance

The AOZD establishes six (6) airport overlay zones which govern land uses within a three (3)mile jurisdictional boundary of the Airport, as previously discussed in Chapter 3 of this document. Compatible land uses within the airport overlay zones are based upon the proposed development location and land use in relationship to the Airport, more specifically the proximity to runway ends and extended runway centerlines. The three (3)-mile jurisdictional boundary was established by Wisconsin Statute Chapter 114.136. The six (6) airport overlay zones were developed generally based upon Federal Aviation Administration (FAA) Federal Aviation Regulations (FAR) Part 77 specifications and are titled:

- Zone A Runway Protection Zone (RPZ)
- Zone B1 Approach Surface (inner)
- Zone B2 Approach Surface (middle)
- Zone B3 Approach Surface (outer)
- Zone C Transitional Surface
- Zone D Three (3)-Mile Zoning Radius

In addition to the six (6) airport overlay zones, the AOZD also regulates height limitations (**Figure 3-9**) that are associated with the Airport based upon a long standing ordinance originally adopted by the City of La Crosse in 1960. Height limitations are determined by FAA FAR Part 77. Proposed development and structures within the three (3)-mile jurisdictional boundary of La Crosse Municipal Airport must be reviewed based upon their location, height, and land use relative to the AOZD.

The review process begins with local building officials, elected officials, and the City of La Crosse planning staff. To ensure the proposed development is compatible with the AOZD and the La Crosse Municipal Airport, specific height and land use restrictions are evaluated within each airport overlay zone and reviewed to varying degrees by the City of La Crosse, and surrounding municipalities. Items to be reviewed include, but are not limited to the:

- Potential for attracting a concentration of people (density)
- Creation of a land use the would exceed height standards
- Potential to cause visual obstructions
- Potential for noise sensitivity concerns
- Creation of smoke/steam/dust or other visual obstruction
- Creation of electrical, navigation, or radio interference
- Creation of standing water leading to wildlife and bird attractants
- · Potential storage of flammable or hazardous materials
- Location of the proposed land use within La Crosse Municipal Airport's environs, specifically with regard to proximity to runway ends and extended runway centerlines
- Location of the proposed development relative to aircraft operational areas on the ground and in the air

Additional review will be coordinated at the local level, in accordance with the guidelines set forth in the *Airport Overlay Zoning District Ordinance*.

The review process and responsibility for implementation are outlined in Chapter 15.19 of the La Crosse Municipal Code – *Airport Overlay Zoning District Ordinance*.

# Appendices

- Appendix A City of La Crosse
- Appendix B City of Onalaska
- Appendix C Town of Campbell
- Appendix D Town of Medary
- Appendix E Town of Onalaska
- Appendix F Village of Holmen
- Appendix G City of La Crescent
- Appendix H Town of Dresbach
- Appendix I Town of La Crescent



















