

scott air force base

MIDAMERICA ST. LOUIS AIRPORT

Joint
Land
Use
Study



AUGUST 2008

EDAW | AECOM



RICONDO
& ASSOCIATES

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Background

Scott Air Force Base
MidAmerica St. Louis Airport
Joint Land Use Study

In an effort to conserve paper, this document is formatted to be printed double sided

Part 1: Background

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The Scott Air Force Base/ MidAmerica St. Louis Airport Joint Land Use Study (JLUS) is a cooperative land use planning initiative between the U.S. Air Force and the surrounding communities in the region. Partners in the JLUS include: the City of Lebanon, the City of Mascoutah, MidAmerica St. Louis Airport, the City of O'Fallon, Scott Air Force Base (AFB), the Village of Shiloh, and St. Clair County.

This document serves as an ongoing guide to local governments and Air Force actions to enhance compatibility around Scott AFB and MidAmerica St. Louis Airport and strengthen the military-civilian relationship.

Policy Committee:

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Scott Abner, Mayor, City of Lebanon
Gerald Daugherty, Mayor, City of Mascoutah
Gary L. Graham, Mayor, City of O'Fallon
CE Commander Edwin Oshiba, Scott AFB, *ex officio*
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Study Purpose and Goals

The purpose of this Joint Land Use Study (JLUS) is to ensure that surrounding communities can sustain economic activity without degrading the military readiness activities of Scott Air Force Base and civilian airport operations at the MidAmerica St. Louis Airport.

The goals of the study are to:

- Clarify existing land use compatibility guidance and develop effective tools for assessing development around the base and Airport
- Increase communication among the military, the Airport and surrounding communities;
- Evaluate the potential impacts of current and future military and airport operations on surrounding communities;
- Evaluate the potential impacts of community growth on the long-term viability of Scott AFB and the Airport; and
- Recommend action items to reduce encroachment and facilitate future collaboration

Background

Scott Air Force Base (Scott AFB) and MidAmerica St. Louis Airport are in north central St. Clair County, Illinois, about 20 miles east of St. Louis, Missouri. (See Figure 1- *Study Area Region*). Surrounding communities include St. Clair County, the city of Mascoutah to the southeast, Lebanon to the northeast, O'Fallon to the northwest and the Village of Shiloh to the west and south west

Established as an airfield in 1917, Scott AFB has long been the home of the 375th Airlift Wing; and today hosts the Air Mobility Command, The United States Transportation Command (TRANSCOM), five headquarters, a

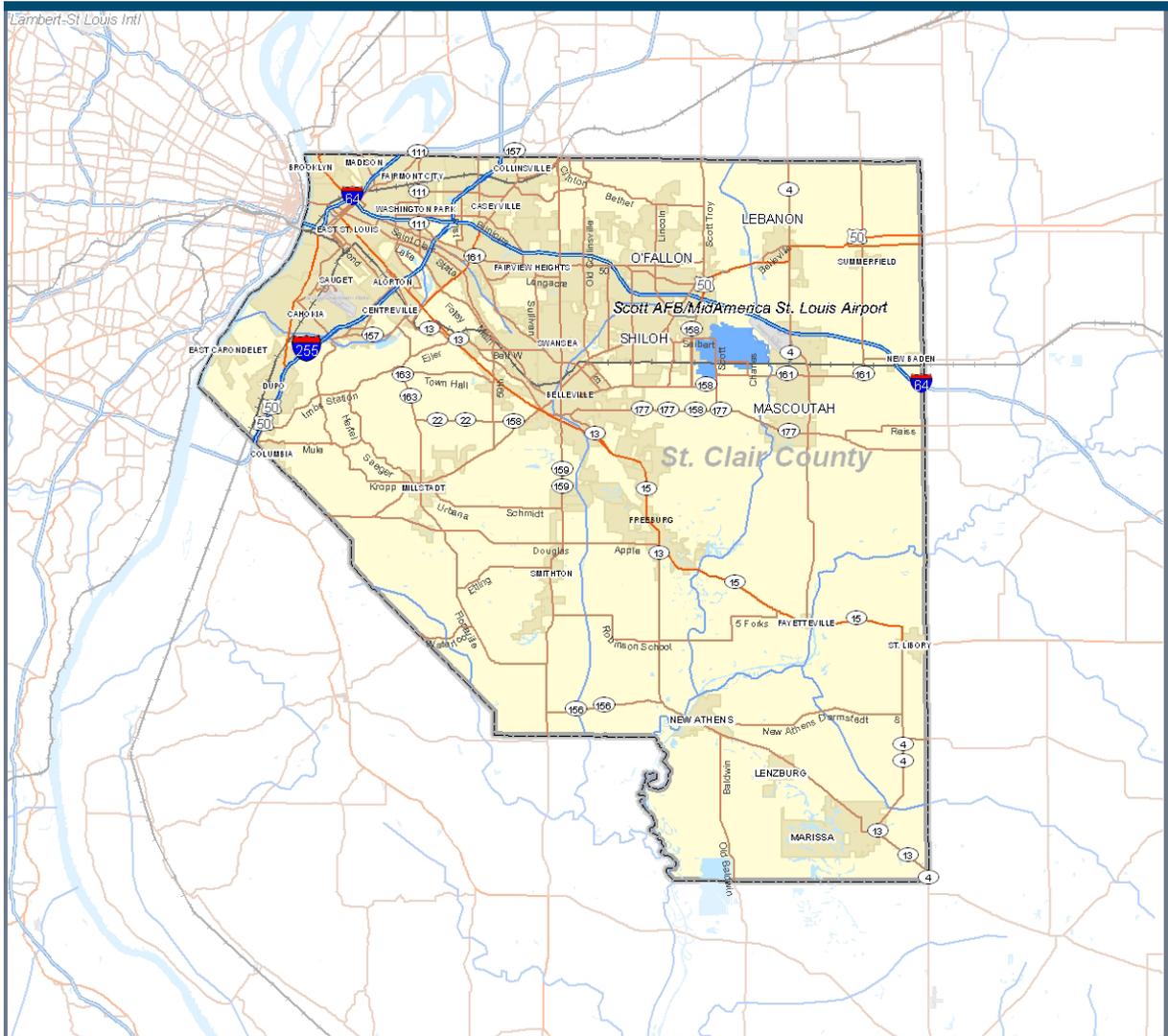
reserve aeromedical airlift wing and an Air National Guard unit. Recent Base Realignment and Closure (BRAC) activities will result in approximately 1,260 new personnel at the base.

The MidAmerica St. Louis Airport (Airport) is co-located with Scott AFB and shares airfield facilities under a joint-use agreement. St. Clair County operates the Airport as a Federal Aviation Administration (FAA) designated Non-Hub Primary Commercial Serving Airport. The Airport currently hosts charter service to Las Vegas, Nevada and Orlando, Florida and is beginning to establish a presence as an international air cargo center. Long term plans for the Airport will generate increased aviation activity, resulting in potential increased noise levels in the surrounding community.

What is Encroachment?

The long-term goal of the JLUS is to reduce potential encroachment, accommodate growth and sustain the regional economy. The term 'encroachment' describes the operational impacts of military and airport activities on surrounding communities and the reciprocal negative effects of adjacent and unmanaged community growth on training and aviation operations. Designated geographic boundaries that represent noise and air safety impacts— the military runway Accident Potential Zones (APZs), the civilian Runway Protection Zones (RPZs) and Noise Zones— extend beyond property owned by Scott AFB and the Airport into surrounding communities. Later sections of this report explore the interaction of these areas with nearby land uses.

While noise and safety concerns can affect residents living and working around the base and Airport, certain nearby civilian land uses that concentrate people, such as higher density housing or public gathering places can threaten aviation operations. Ongoing complaints about noise and night flights can place pressure on Scott AFB and the Airport to modify current



Study Area Region

operating procedures, thus reducing realistic training capabilities or curtailing business activity and economic growth. Methods of reducing and preventing encroachment include a menu of tools, such as compatible land use planning, infrastructure planning, real estate disclosure, site development requirements, operational changes on the Airport and base, and wildlife habitat conservation. One of the purposes of the JLUS is to provide feasible and locally appropriate recommendations to minimize encroachment potential and develop clear guidance for assessing the compatibility of local growth options.

The JLUS report is not a binding document, but rather an advisory report that identifies best practices for ensuring compatible development around the base and the Airport. The report includes a series of recommended policies and regulations for the Air Force and local governments to consider. It is the responsibility of each participating entity to review the proposals and implement recommendations appropriate for their local context.

Communication and Coordination Strategy

A main component of the JLUS is to increase communication among surrounding communities, Scott AFB, and MidAmerica St. Louis Airport. The JLUS process encourages

residents, local decision-makers, military representatives, and airport operators to examine issues of compatibility and encroachment in an open and transparent forum, balancing both military and civilian interests.

The JLUS Report will include a coordination strategy to guide decision makers and the general public through the current planning process and to build the framework for successful implementation and monitoring.

Summary of Public Participation

The JLUS process seeks to create a community-based plan that builds consensus from varied interests, including residents, local elected officials, businesses, and military representatives.

Stakeholders

To achieve a community-based approach, the process organizes stakeholders into two bodies: the Working Group and the Policy Committee. The purpose of this organizational structure is to ensure that the final JLUS report includes a cross-section of opinions and reflects feasible, practical solutions.

Working Group

The Working Group consists of area planners, city and county managers, technical and professional staff, military planners and representatives from MidAmerica St. Louis Airport. This group is responsible for data collection, identifying and studying technical issues, and developing recommendations for consideration by the Policy Committee.

Policy Committee

The Policy Committee consists of local elected officials from each participating jurisdiction, along with leadership from Scott Air Force Base and MidAmerica St. Louis Airport. The Policy

Committee oversees the JLUS process, reviews draft and final written reports, and evaluates policy recommendations. The JLUS study does not supersede the regular local legislative process. Locally elected officials remain responsible for formally adopting any recommended regulatory policies.

Summary of Community Participation

Table 1 below identifies milestones and meetings dates that occurred during the process.

Table 1: Meeting Dates and Schedule

Meeting	Date
Kick-off Meeting	October 26
Stakeholder Interviews	November 13 -14
Technical Memo #1	January 25
Working Group Meeting #1	January 31 and February 1
Technical Memo #2	March 3
Policy Committee Meeting	March 14
Working Group Meeting #2	April 15
First Public Meeting	April 29
Working Group and Policy Committee Meeting #3	June 27
Second Round of Public Meetings	August 21-27

Stakeholder Input

The planning team conducted a series of stakeholder interviews to establish priorities to guide policy development. In general, respondents identified the following issues:

- Concern about limitations on growth due to potential noise impacts and regulations;
- Lack of certainty about the use of DoD or FAA land use compatibility standards;
- The desire for a clear-cut demarcation of areas affected by Scott and MidAmerica operations

- Lack of familiarity with definitions of compatible land uses;
- The long-term growth impacts of a new highway interchange on land use patterns in nearby communities;
- The ability of Facilities Planning Areas to influence development in the area;
- Only partial participation in Jurisdictional Boundary Agreements;
- Desire for existing community plans to correspond with JLUS and future MidAmerica Airport plans;
- Lack of community awareness of increased activity and future missions on Scott AFB; and
- One access road serving the Airport

Public Participation Opportunities

In addition to the Policy Committee and Working Group meetings, the JLUS planning team will conduct two rounds of public involvement events in each participating community. These meetings will give residents an opportunity to understand the existing issues, review draft land use compatibility tools, and provide input on implementation strategies.

In addition to public meetings, the public can access a website that tracks the progress and results of the Joint Land Use Study at <http://www.co.st-clair.il.us/> under the letter “J”. The site will host regular meeting notices, FAQs, links to participating entities, technical reports and maps, and contact information.

Overview of Previous Compatibility Actions And Ongoing Initiatives

Federal Compatibility Initiatives

Military Initiatives

Since its inception, Scott AFB has continued to grow in importance to the Air Force and the Department of Defense. Over the years, the

cities and counties around Scott AFB have grown along with the military, reinforcing the close relationship between the complex and the nearby communities. This interdependence, however, raises the challenge that is central to the Joint Land Use Study effort. As military installations expand, they bring new people and economic activity to an area. The communities then build houses, schools and infrastructure, and create new jobs to support military personnel, base workers, and their families. More people begin to live and work in proximity to the noise and safety risks generated by military installations. The presence of civilian uses can in turn place pressure on installations to modify their operations, possibly compromising the overall military mission.

The Department of Defense (DoD) has three major programs designed to address potential conflicts between military and civilian land uses. In 1972, the DoD established the Air Installation Compatibility Use Zone (AICUZ) program, to identify noise-affected areas around installations and to develop cooperative approaches for reducing adverse impacts. Scott Air Force Base updated their AICUZ study in 2001.

In 1985, the DoD initiated the Joint Land Use Study (JLUS) program to create a community-based framework for land use planning around military installations. The JLUS process encourages residents, local decision-makers, and installation representatives examine current and foreseeable land use conflicts and develop collaborative solutions that balance military and civilian interests.

Participating communities initiated this JLUS effort for the region around Scott Air Force Base and MidAmerica St. Louis Airport. The Office of Economic Adjustment (OEA) within the DoD funded 90 percent of the study, while the communities supplemented the initiative local resources.

In 2003, the DoD established the Readiness and Environmental Protection Initiative (REPI) to meet the complementary goals of protecting military installations from encroachment, while preserving the valuable habitat surrounding these installations. The REPI program allows installations to protect adjacent non-military land through partnerships with state and local governments or non-governmental organizations. The partners share the cost of purchasing conservation easements from willing sellers, thus preserving high-value wildlife habitat and limiting incompatible development around installations.

Federal Aviation Administration Initiatives

The Federal Aviation Administration (FAA) addresses issues of noise and safety risk from civilian aircraft operations through the 1979 Aviation Safety and Noise Abatement Act (ASNA Act) called the Noise Compatibility Study, or Part 150 Study. The purpose of the Part 150 Study is to reduce existing and potential non-compatible uses surrounding an airport. Following completion of a Part 150 Study, an airport can seek funding for implementation, such as the voluntary purchase of aviation easements on affected properties.

In 2006, St. Clair County initiated an Airport Master Plan Update for MidAmerica St. Louis Airport. The Plan Update evaluates requirements for the modernization and expansion of the landside and airside facilities over the next 20 years at the Airport. Completed in July of 2007, the first phase of the study assesses market opportunities in aeronautical and non-aeronautical activity and identifies the capacity and capabilities necessary to support this growth. As part of the second ongoing phase, the study will develop alternatives for meeting the capacity and capability requirements and will evaluate commercial opportunities and regional economic impacts.

State Compatibility Initiatives

The State of Illinois passed the County Air Corridor Protection Act in 2003 to enforce compatible development surrounding military installations. HB 1338, 2003, enables counties with a U.S. Air Force installation with runways that are at least 7,500 feet in length to:

- “Protect the safety of the community by controlling” land uses designated in the Air Installation Compatible Use Zone (AICUZ) Study adopted by the United States Air Force.
- Utilize eminent domain powers to acquire land or an easement when a land use exists or when a municipality approves a use that is not compatible with the AICUZ and falls within the following areas:
 - clear zones and runway protection zones
 - accident potential zones I and II or
 - within the 65 decibel contour.

Operational Impact Reduction

Scott AFB and MidAmerica St. Louis Airport have jointly reviewed their aircraft operations for voluntary reduction of noise impacts on surrounding communities. The JLUS planning team reviewed these procedures for further potential changes to reduce the noise impact on the region.

The SAFB/MAA Airfield Management and Air Traffic Control (ATC) publication, dated January 9, 2007, the SAFB Air Installation Compatible Use Zone (AICUZ) Study, dated February 2001, and approach and departure procedure information published by the National Oceanic and Atmospheric Administration (NOAA), dated May 13, 2008 were reviewed for this analysis. The AICUZ study provides the most comprehensive source of representative flight tracks for military and civilian operations at the Airport.

NOAA approach and departure procedures information, which outlines procedures for civilian aircraft approaching or departing the Airport, were reviewed to identify any differences from the AICUZ data. Approach procedures for the airport are straight in from the Final Approach Fix (FAF) to the runway threshold.

No obstacle departure procedures are published for the Airport. Standard instrument departures and departure procedures instruct pilots to fly ATC issued vectors to the appropriate departure route. The SAFB ATC publication indicates that detailed Instrument Flight Rules (IFR) climb-out instructions are issued for non-local operations. The published NOAA approach procedures for civilian operations are represented in the AICUZ flight tracks. In the immediate vicinity of the Airport, departure procedures are dependent on ATC issued instructions, which are not reflected in the published information.

Noise abatement procedures published in the SAFB ATC document are as follows:

- All heavy or afterburner aircraft departing Runway 14R-32L will climb straight ahead to a minimum of 2,000' MSL and 1 NM from the departure end of the runway before entering a closed pattern for the respective runway.
- To the maximum extent possible, aircraft will avoid flying over the Cities of Lebanon and O'Fallon, Village of Shiloh, and Scott ADB noise-sensitive uses.
- Transition training will not be performed on Runway 14R-32L from 2200 until 0600 local time unless coordinated and approved by the 375 OG/CC.

The AICUZ flight tracks, when considered in conjunction with the SAFB ATC noise

abatement procedures, appear to minimize over-flight of surrounding noise sensitive land uses. Approach flight tracks extend over O'Fallon and Mascoutah, however, safe operating procedures provide little flexibility to adjust approach operations. In general, departure flight tracks provide multiple opportunities to avoid residential communities, and ATC vectoring and noise abatement procedures should provide sufficient flexibility to minimize overflight of noise sensitive areas.

Short pattern fixed and rotary wing training for small aircraft appear to avoid over-flight of Shiloh and Mascoutah, while longer patterns partially over-fly residential areas. KC-135 transition training on Runway 14L-32R appears to avoid direct over-flight of noise sensitive areas. Noise abatement procedures directing pilots to avoid over-flight of residential areas should minimize use of closed pattern tracks over surrounding communities.

Based on the location of noise sensitive areas relative to the Airport and existing noise abatement procedures, there do not appear to be any changes to standard operating procedures that would significantly reduce noise or other operational impacts on the surrounding communities.

Other Compatibility Initiatives

St. Clair County MidAmerica Airport Sub-Area Plan, 1998

The St. Clair County Sub-Area Plan for MidAmerica Airport was a multi-jurisdictional study among St. Clair County, IDOT (Illinois Department of Transportation), Belleville, Lebanon, Mascoutah, O'Fallon, and Shiloh to preserve the future growth, expansion, and mission capabilities of both MidAmerica Airport and Scott AFB by providing a guide for development decisions within the surrounding areas.

The report included an analysis of existing development and infrastructure and established

a set of goals and objectives. Using these objectives, the study produced a plan for land use, transportation system improvements, and water and sewer infrastructure improvements. The plan also anticipated the addition of two Airport runways to the east.

The final section of the plan recommended adoption of an Airport Environs Overlay district (AEO) to include all land in the study area. The majority of the recommendations focused on the creation of a Joint Airport Zoning Board (JAZB) comprised of local elected officials and the airport operator. The body would have the authority to decide land use, zoning and building permit issues within the AEO district and act in an advisory role for issues within a 3-mile radius of the AEO. Decisions of the JAZB would be binding and could not be overturned by any of the local governments. The Appeals Board of the JAZB would consist of a board appointed by members of the JAZB. Administrative staff in the St. Clair County Land Development Office would serve the JAZB.

During the planning process, the affected municipalities examined the feasibility of a Joint Airport Zoning Board. After discussion for more than a year following study completion, stakeholders discontinued official dialogue in 1999 without the formation of this board. However, individual municipalities adopted components of the Sub-Area Plan recommendations such as overlay zones and updated comprehensive plan language. The plan was also successful in providing affected communities an understanding of compatible land use planning around airports and military installations.

LEAM Lab

The LEAM lab, based at the University of Illinois at Urbana-Champaign, utilizes a computer modeling program called Land Use Evolution and Impact Assessment Model (LEAM) to map the possible effects of future land use decisions.

The LEAM tool and process can assist military planners by visually depicting the consequences of emerging growth trends near installations. The LEAM lab worked with the East West Gateway Council of Governments and the Southwestern Illinois Resource Conservation and Development, Inc. to develop a model visualizing future land use scenarios in the St. Louis region, including St. Clair County.

In an ongoing effort sponsored by East-West Gateway Council of Governments and the Army Corps of Engineers Engineer Research and Development Center (ERDC-CERL), the LEAM Lab held a special regional planning effort to provide key stakeholders an opportunity to consider the potential future growth patterns around Scott Air Force Base and its effects on the military installation. The summary report was published in 2006 and is available on the LEAM Lab website at <http://www.lead.uiuc.edu/lead/pdf/downloadable-doc>. A brief summary is outlined below.

The modeling process creates future scenarios and compares them to a base scenario of "Business as Usual". This base scenario inputs current development and projects the future development using existing trends.

Other scenarios altered the base model to reflect a particular assumption. The model, for example, demonstrates that an increase of 50 percent in military personnel at Scott AFB by 50%, or 7,000 troops, does not have a significant impact on development patterns in the immediate area surrounding the base. The scenarios exploring the new I-64 interchange at Rieder Road and new commercial growth in planned business parks resulted in concentrated commercial activity in those areas. The Gateway Connector assumed that the outer loop project would be constructed as limited access, and therefore resulted in less commercial growth along the corridor. Because

the Gateway Connector will use the existing right-of-way of IL-158, strip commercial growth will be limited, therefore reducing potential commercial encroachment on the base.

During the LEAM charrettes, there were two recurring themes: the need for a mechanism to facilitate a long term dialogue on important planning issues for Scott Air Force Base and its surrounding communities, and the need of a regional comprehensive land use plan. Participants were emphatic about the importance of maintaining a forum for Scott AFB and local communities beyond the project.

St. Louis Metropolitan Area Aviation System Study

The East West Gateway Council of Governments is currently involved in the St. Louis Metropolitan Area Aviation System Study to examine the region's aviation assets and to establish a strategic regional approach for the future development of these assets. Study objectives are to provide recommendations and strategies for:

- Identifying the long-range air transportation needs of the region;
- Maximizing the efficiency, effectiveness, and safety of existing and planned aviation assets; and
- Creating mechanisms for improved regional cooperation and integration in the development and operation of aviation assets.

Although the main purpose of the study is to provide expansion strategies for the aviation system, land use conflicts and encroachment concerns can significantly influence future growth opportunities for the region's airports. Promoting land use compatibility through encroachment reduction tools can contribute to sustained growth at the shared-use airport.

Scott Air Force Base Activities

Installation History

Scott Air Force Base began as Scott Field in 1917, named after Corporal Frank S. Scott who was the first enlisted man to be killed in an airplane crash on base. Scott Field began with a primary mission of training ground crews and pilots. The United States War Department originally designated the field as a 'lighter than air' station for airships and balloons. Scott saw its first medical lift mission in 1948, when the Military Transportation Service received responsibility for airlifting all military and other government medical patients.

Training activities on the base ended in 1957. Reorganization brought the 375th Military Airlift Wing onto Scott AFB, and since 1975, the 375th has managed the domestic aeromedical evacuation system. Another round of reorganization established Air Mobility Command, now hosted at the base.

Current and Foreseeable Activities

Scott AFB is unique in that it hosts two major commands, the Air Mobility Command (AMC), the Air Force branch of Transportation Command, and the US Transportation Command (TRANSCOM). U.S. TRANSCOM provides the transportation, distribution and sustainability that makes possible the projection of United States national power, and ensures our global influence. Sixty-seven percent of U.S. TRANSCOM's active duty personnel are from military services other than the Air Force. Air Mobility Command's mission is to provide airlift, air refueling, special air missions and aeromedical evacuation for all United States forces.

The 375th AW is the host unit at Scott AFB, providing basic infrastructure and support services for day-to-day operations. The 375th AW has managed the domestic aeromedical evacuation system since 1975 by providing timely airlift of seriously ill or injured military personnel, military family members, and other

Department of Defense patients to medical treatment centers.

In addition, Scott is home to over 25 tenants, including 18th Air Force, 126th Refueling Wing, Defense Information Contracting Organization (DITCO), Air Force Communications Agency (AFCA) and the Air Force Mobility Command and US Transportation Command (TRANSCOM).

The 18th Air Force tasks and executes all air mobility missions. As part of its war-fighting role, the 18th Air Force commands assigned forces, presents air mobility forces (airlift and air refueling) and supports forces to the combatant commanders through U.S. TRANSCOM. The 126th Refueling Wing (ARW) is an Illinois Air National Guard Unit, which relocated to Scott AFB from Chicago in 1998. The 126th ARW is responsible for air refueling in support of combat forces during contingency operations.

DITCO provides contracting and financial services in support of the Defense Information Systems Agency (DISA), including the procurement of telecommunications services, equipment, networks, and information technology services and information processing equipment. DISA plans, develops, fields, operates and supports Communications, Command, Control and Intelligence systems that serve the Department of Defense.

Air Force Communications Agency (AFCA) is the “solution provider” for communications and information-related issues. AFCA is a field operating agency reporting directly to the Headquarters U.S. Air Force Deputy Chief of Staff for Warfighting Integration. Their efforts focus on providing communications and information capabilities throughout the Air Force and supporting the warfighter. About 560 active-duty military members and civilian personnel that are assigned to Scott serve in the Air

Force's Enterprise C4 and Information Technology Center for Excellence.

The location of multiple branches of the military creates a multiservice community atmosphere at Scott that reflects the coordination and streamline operations of today's US military. The mission of Scott Air Force Base is to provide a Total Force team, engaging globally by providing priority airlift, aeromedical evacuation, combat support and medical expertise, while ensuring an outstanding quality of life.

The units based at Scott are in the process of adding and replacing aircraft. The 126th Air Refueling Wing is replacing its KC-135E with the KC-135R and may add C-21 and KC-X aircraft in the future. Also, the 932nd Airlift wing is replacing its C-9 aircraft with the C-40. In addition to the military operations, Scott Air Force Base maintains an aero club with six based aircraft. The club flies an average of 10 operations each day.

The FAA forecasts a constant 30,467 military operations for the years 2006 through 2025. Representatives from Scott AFB indicate that no major changes to operations are expected in the foreseeable future.

Installation Facilities and Personnel

Scott AFB is approximately 2,560 acres and has 1,029 acres of easements and right-of way. The Scott runway is 8,000 feet long and shares a taxiway with the MidAmerica St. Louis Airport. The base has over 963 buildings and 57 miles of paved roads. Housing on base includes over 1,400 family housing units, 4 dorms and 19 temporary quarters.

The Scott AFB Historic District encompasses approximately 375 acres of the base and is listed on the National Register of Historic Places. An 18-hole golf course, four baseball

fields and a running track encircling the entire installation offer residents and personnel recreational opportunities.

Scott AFB currently employs approximately 14,248 persons. In addition to active military personnel and civilian workers, the installation supports approximately 17,020 retirees. The total Scott AFB community, on- and off-base, comprises approximately 39,952 military and civilian personnel and their families. Table 2 contains a breakdown of installation personnel.

Table 2 Installation Population

PERSONNEL POPULATION	
Active Duty Military	6,850
Air Force Reserve	1,138
Air National Guard	854
Federal Civilian Employees	3,100
Non-Appropriated Fund Contract Civilians	2,400
<i>TOTAL WORK FORCE</i>	<i>14,258</i>
Family Members (Dependants)	8,314
Retired Military	17,020
TOTAL POPULATION	39,592

Source: USAF 2005

Due to 2005 Base Realignment and Closure (BRAC) activities, Scott AFB will incur an increase of over 1,000 new personnel. 12 new KC-135R aircraft will relocate from Grand Forks AFB in Nevada, and 8 KC-135E aircraft will be retired. A Mobility Logistics Support Center (LSC) will be established on Scott AFB with personnel from Hurlburt Field, Florida; Sembach, Germany; Little Rock, Arkansas; and Altus Airfield Base.

Another major reorganization from BRAC that will increase Scott personnel is the collocation

of Surface Deployment and Distribution Command from Newport News, Virginia with the existing Air Force Mobility Command and TRANSCOM on Scott AFB. This move will join common function activities and facilitate large scale transformations as proposed by the TRANSCOM Commander.

Economic Impacts of Scott AFB

The economic impact of Scott AFB in the region is based on FY 03 Scott Economic Impact Analysis. According to this study, the installation generated a \$1.66 billion impact in the region, including base payroll to personnel and civilian contractors, base expenditures for goods and services purchased, and an estimated dollar value of indirect jobs. Indirect jobs are those that provide goods and services to individuals who locate in the region due to Scott AFB. An example of an indirect job would be a teacher who is hired because more school-aged children have moved into the region with their military parents.

The FY03 payroll for Scott AFB was \$970 million and included \$412 million in annual expenditures. Scott AFB contributed \$42 million to the region's economy in the form of construction contracts, over \$190 million in materials, equipment, and supplies, and another \$112 million in additional services.

Midamerica St. Louis Airport Activities

Airport History

Planning for MidAmerica St. Louis Airport began in the 1980s, when the sole full-service commercial airport serving the region, Lambert-St. Louis International Airport (Lambert) functioned as a Trans World Airlines (TWA) hub. In 1986, the Illinois Department of Transportation published a Feasibility Study of Joint Military-Civilian Use of Scott Air Force Base that predicted a shortage of airport capacity in the St. Louis area by 1990. The

study concluded that locating additional facilities at Scott Air Force Base would help to reduce congestion at Lambert, improve the local economy, and enhance the capabilities of Scott Air Force Base.

In 1991 the Department of the Air Force and St. Clair County signed a joint use agreement to establish a shared-use airport. The agreement specified that St. Clair County would purchase land to construct an Airport consisting of a runway, an air traffic control tower, terminal facilities, fuel storage, and an independent aircraft rescue and firefighting (ARFF) facility. The agreement also identified improvements to the Scott Air Force Base airfield, relocation of a residential development for Air Force personnel and their families, and operating procedures for the facility.

Construction of the Airport began in 1994 and MidAmerica St. Louis Airport officially opened in 1998. Since the inauguration of the Airport, commercial service has developed slowly. Sweeping changes in the aviation industry as a result of the post-technology boom economic slowdown and the events of September 11, 2001, strongly affected aviation demand in the St. Louis region. American Airlines acquired Trans World Airlines (TWA) and drastically cut service to St. Louis Lambert International Airport, reducing the number of passengers connecting through the airport. In addition, St. Louis Lambert International developed a new runway, increasing available airfield capacity in the region, and thereby reducing the demand for MidAmerica St. Louis Airport passenger services.

Ongoing Airport Planning

Today, MidAmerica St Louis Airport is engaged in a master planning process to assess the strategic options available for airport development. The process is being conducted in two phases. Phase I, which was completed

in July 2007, assessed the market opportunities that could contribute to growth in aeronautical and non-aeronautical activity, and identified the capacity and capabilities necessary to support this growth. Phase I focused on the following four main tasks:

- Existing Conditions
- Market Demand
- Demand/Capacity and Facility Requirements
- Public Involvement

The Existing Conditions documentation provides an inventory of existing facilities, defines the current operating conditions, and summarizes the environmental considerations. Market Demand assesses how the various activities related to the Airport may develop over time. Demand segments include commercial passenger service, cargo, general aviation, military activity, aircraft maintenance and repair, and non-aeronautical activity. The market demand assessment prepared a baseline activity forecast and a series of alternative scenarios to capture the range of potential demand that could develop at the Airport over the planning timeframe. Table 3 presents the baseline activity forecast in terms of commercial passenger enplanements, cargo tonnage, aircraft operations, and based aircraft. Table 4 presents the alternative demand scenarios, grouped into Planning Activity Levels (PAL).

The Demand/Capacity and Facility Requirements analysis compares the existing conditions with the potential future demand. When future demand exceeds the capacity or capability of existing airport facilities, expansion will be required. The analysis developed requirements for airport facilities such as: airfield, passenger terminal, air cargo, general aviation, support facilities (e.g. fire protection), ground access, utilities, and non-aeronautical facilities.

Table 3: Market Demand Summary

Year	Enplanements	Cargo Tonnage	Operations				Based Aircraft	
			Commercial Passenger	Cargo	General Aviation	Military		Total
2007	29,386	-	522	-	7,362	30,467	38,351	-
2008	30,627	6,435	544	52	7,727	30,467	38,790	1
2009	31,909	12,870	567	104	8,123	30,467	39,261	1
2010	33,234	12,870	591	104	8,525	30,467	39,686	2
2011	45,656	19,305	812	156	8,932	30,467	40,367	3
2012	47,522	19,305	845	156	9,343	30,467	40,811	4
2013	49,450	25,740	879	208	9,760	30,467	41,314	5
2014	51,442	32,175	915	260	10,181	30,467	41,823	5
2015	53,499	38,610	951	312	10,604	30,467	42,334	6
2016	55,623	45,045	989	364	11,032	30,467	42,852	7
2017	57,817	64,350	1,028	520	11,463	30,467	43,477	8
2018	60,082	70,785	1,068	572	11,898	30,467	44,005	9
2019	62,421	77,220	1,110	624	12,338	30,467	44,538	9
2020	76,180	83,655	1,354	676	12,781	30,467	45,279	10
2021	79,109	90,090	1,406	728	13,229	30,467	45,830	11
2022	82,132	96,525	1,460	780	13,681	30,467	46,388	12
2023	85,252	102,960	1,516	832	14,137	30,467	46,951	13
2024	88,473	102,960	1,573	832	14,597	30,467	47,469	14
2025	91,797	109,395	1,632	884	15,062	30,467	48,045	15
2026	95,226	115,830	1,693	936	15,531	30,467	48,627	15
2027	98,765	115,830	1,756	936	16,006	30,467	49,165	16
2028	102,417	122,265	1,821	988	16,484	30,467	49,760	17
2029	106,184	122,265	1,888	988	16,967	30,467	50,309	18
2030	110,070	135,135	1,957	1,092	17,393	30,467	50,909	19

Table 4: Demand Level Forecasts

	Existing - 2006	PAL 1	PAL 2	PAL 3	PAL 4	PAL 5	PAL 6
ENPLANED PASSENGERS							
Annual	35,386	53,499	110,070	148,920	265,532	335,790	455,729
Peak Month	4,439	5,350	11,007	14,892	26,553	33,579	45,573
Average Day	535	428	570	1,045	1,625	1,957	2,470
Peak Hour	143	150	150	203	354	310	423
COMMERCIAL PASSENGER AIRCRAFT OPERATIONS							
Annual	548	951	1,957	3,913	5,997	8,674	11,482
Peak Month	55	95	196	391	600	867	1,148
Average Day	5	6	10	20	30	44	58
Peak Hour	2	2	2	4	6	7	9
GENERAL AVIATION OPERATIONS							
<u>SAFB Related</u>							
Annual	9,920	8,098	9,684	8,098	9,684	9,684	9,684
Peak Month	992	810	968	810	968	968	968
Average Day	50	26	31	26	31	31	31
Peak Hour	7	7	8	7	8	8	8
<u>MidAmerica Related</u>							
Annual	765	2,506	7,709	7,063	15,418	23,030	23,030
Peak Month	77	251	771	706	1,542	2,303	2,303
Average Day	4	8	25	23	50	74	74
Peak Hour	1	2	6	6	12	19	19
MILITARY OPERATIONS							
Annual	19,875	30,467	30,467	30,467	30,467	30,467	30,467
Peak Month	1,988	3,047	3,047	3,047	3,047	3,047	3,047
Average Day	99	98	98	98	98	98	98
Peak Hour	25	25	25	25	25	25	25
ALL-CARGO OPERATIONS							
Annual	-	312	1,092	1,768	2,704	3,692	3,692
Peak Month	-	26	91	147	225	308	308
Average Day	-	1	4	7	11	15	15
Peak Hour	-	1	2	4	5	7	7

Phase II of the process began in late 2007. It will prepare development alternatives to identify the options for providing the capacity and capability requirements. Phase II will include a strategic alternatives analysis process designed to evaluate options within the context of commercial opportunities, regional benefit, cost and impact. A decision framework will be developed to guide near-term actions to maximize the ability of the Airport and the region to capitalize on the ultimate direction and scale of growth.

Airport Facilities

The existing runway configuration between Scott AFB and MidAmerica St. Louis Airport consists of two parallel runways that are oriented northwest-southeast. The Airport runway is 10,000 feet long and 150 feet wide, while the military runway is 8,001 feet long and 150 feet wide. The two are connected by Taxiway G, which crosses Silver Creek. See Figure 2- *Airport Areas*, for a regional view of the Airport. Airport properties are indicated by a lighter shade.

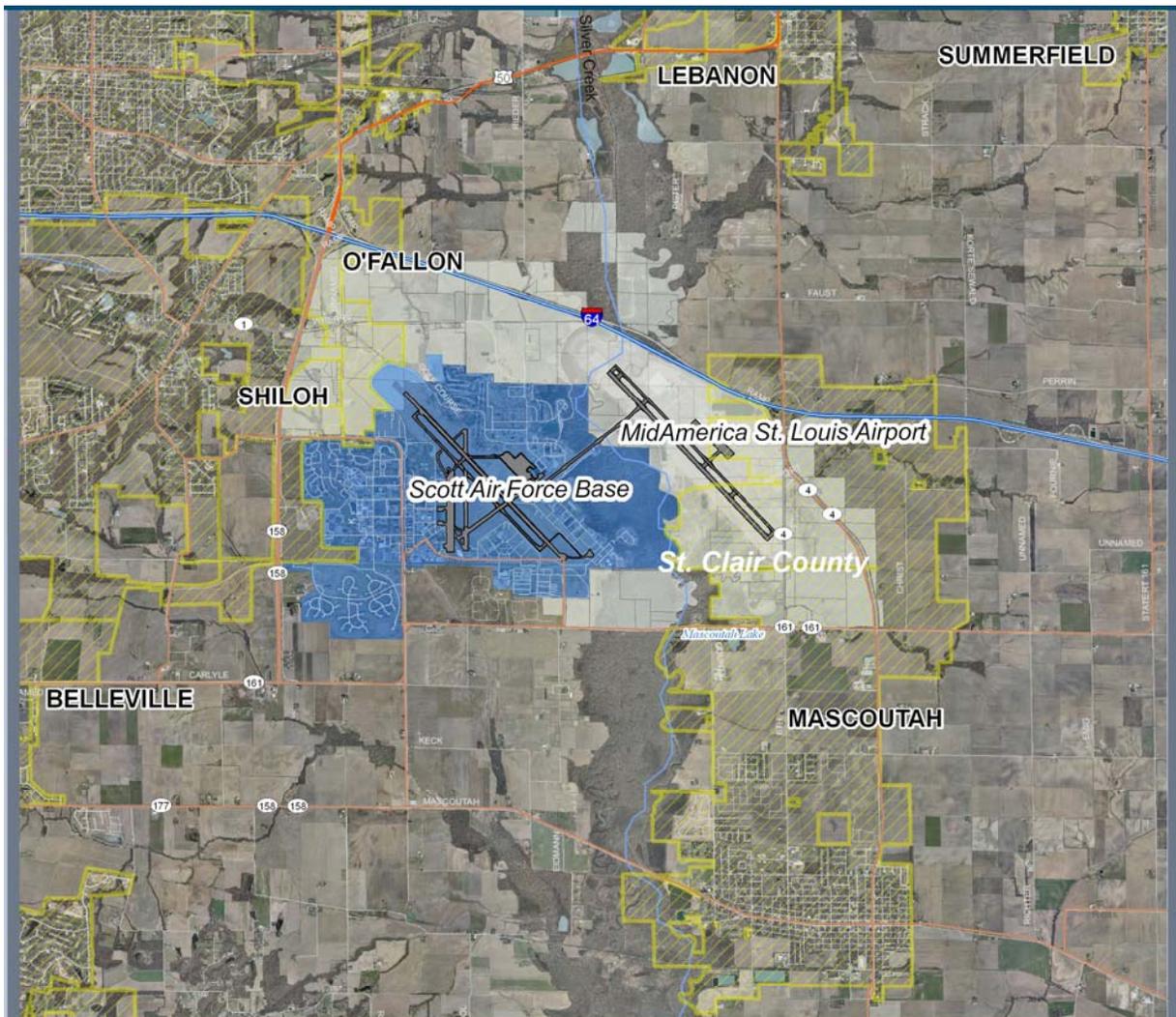


Figure 2: Airport Areas

The Air Traffic Control Tower is on Airport property and operates the two airports as a single facility. Currently, Air Force personnel staff the tower. When operations exceed an established threshold, as defined by FAA Order 7031.2C, the FAA will assume control of the tower.

MidAmerica St. Louis Airport facilities include a passenger terminal built in 1997 and an air cargo terminal constructed in 2005. The main warehouse has 50,000 square feet of floor space, approximately half of which is leased by Trade Zone Partners. The Airport sets aside an additional 5,000 square feet for use as Foreign Trade Zone 31, a secure area that contains international shipments waiting to clear customs. The cargo facility has 37 landside bays and 10 airside bays that are designed for compatibility with standard semi-trailers.

Support activities include aircraft rescue and fire fighting (ARFF), airport maintenance, snow removal, fueling and security. A 9,000 square foot facility housing these activities is in a complex just south of the general aviation facilities.

One road, Airport Boulevard, serves the entire Airport campus. This road connects to the Route 4 and serves the passenger terminal, the cargo facility, and the aircraft rescue and fire fighting facility.

Current and Foreseeable Activities

In 2005, Allegiant Air began commercial service at the Airport, increasing passenger levels. Allegiant Air currently operates four weekly departures, two each to Las Vegas and Orlando Sanford International Airport, and began a third seasonal Orlando departure in late February, 2007. The Airport conducted a total of 31,039 operations in 2006, slightly down from a peak of 31,945 operations in 2003. Military activity represented roughly 64 percent of the operations in 2006, trending downward from a high of 87 percent in 2002 as general aviation

activity has increased. General aviation operations accounted for 34 percent of the 2006 activity, up from 13 percent in 2002.

According to Airport senior management, future operations will include two new cargo services: daily drops of 400 tons of product each and bi-weekly drops of 110 tons of product each. Boeing-747 civilian aircraft will conduct both cargo drops.

Regional Demographics and Growth Trends

Population Projections

The East West Gateway Council of Government, St. Clair County, the City of O'Fallon, the City of Mascoutah, and the Village of Shiloh provided population projections for this analysis. Population projections for small areas are challenging due to the disproportionate influences of variables, such as local real estate markets, municipal boundaries, available vacant land, and large scale projects. Population projections presume the continuation of current trends and general stability in the national and regional economy. Because projections for small areas are inherently unstable, this section does not provide population projections for areas below 5,000 in population.

St. Clair County

After population losses during the 1990s, St. Clair County regained population during the first half of the decade and shows steady growth through 2030. Over the next two and half decades, the county will add close to 24,000 new residents

Table 5: St. Clair County Population Forecast

	1990	2000	2005	2010	2015	2020	2025	2030
Number	262,852	256,082	260,100	265,800	270,600	274,300	279,600	284,100
% Increase			1.6%	2.2%	1.8%	1.4%	1.9%	1.6%

Source: Long Range Population and Employment Projections, 2004, EWCOG

The East West Council of Government's projections also include population and employment projections for five geographic sub-areas of the county. All participating JLUS governments fall within sub-area 35.

Table 6: St. Clair County Sub-area 35 Population Forecast

	1990	2000	2005	2010	2015	2020	2025	2030
Number	NA	160,424	165,600	172,100	175,400	178,300	182,300	185,500
% Increase			3.2%	3.9%	1.9%	1.7%	2.2%	1.8%

Source: Long Range Population and Employment Projections, 2004, EWCOG

City of O'Fallon

The City of O'Fallon has seen strong population growth since 1990, and this trend has accelerated since 2000. The rate of population growth in the city has significantly outpaced population growth in St. Clair County. The City's 2006 Comprehensive Plan includes high, medium, and low population forecasts through 2030. The medium-range population forecast shown below is based upon an extrapolation of past 25-year population trends and reflects steady growth through 2030.

Table 7: City of O'Fallon Population Forecast

	1990	2000	2005	2010	2015	2020	2025	2030
Number	16,064	21,910	25,791	28,328	NA	33,690	NA	39,052
% Increase			17.7%	9.8%	NA	18.9%	NA	15.9%

Source: O'Fallon Comprehensive Plan, 2006

City of Mascoutah

The City of Mascoutah does not have available population forecasts. The 2006 Census estimate indicated a population of 6,737 people. During the 1990s, Mascoutah saw virtually no population growth, but since 2000, has reversed this flat trend. According to City staff, the City has been issuing a consistent number of single family building permits every year since 2000. Assuming that the City of Mascoutah continues issuing an average of 100 single-family permits per year until 2020 and 75 single-family permits per year until 2030, and that the average household size is similar to the national average, the City will double its population with an additional 5,128 residents by 2030.

Table 8: City of Mascoutah Population Forecast

	1990	2000	2005	2010	2015	2020	2025	2030
Number	5,511	5,659	6,737	8,037	9,278	10,178	11,040	11,865
% Increase		2.7%	19%	19.3%	15.4%	9.7%	8.5%	7.5%

Source: EDAW Forecast based on City-provided permit data and US Census Factfinder projected household size, 2007

Village of Shiloh

The Village of Shiloh has seen exceptional population growth and development since 1990. The Village's 2004 Comprehensive Plan provides population projections through 2012 and assumes approximately 200 new housing starts a year and a household size of approximately 2.8 persons per household. This growth rate would produce about 2,800 new residents every five years. Assuming that growth will decrease as the supply of vacant land shrinks, the village is likely to sustain a more modest growth rate in the years ahead. The projections below assume that the village will increase by approximately 2,500 people every 5 years.

Table 9: Village of Shiloh Population Forecast

	1990	2000	2005	2010	2015	2020	2025	2030
Number	2,650	8,069	10,779	13,579	16,079	18,579	21,079	23,579
% Increase			33.6%	26.0%	18.4%	15.5%	13.5%	11.9%

Source: EDAW Forecast based on Village of Shiloh Comprehensive Plan data, 2007

Regional Infrastructure

Locating and funding of public works projects can exert strong influences over land use trends and demands. Wastewater treatment capacity and roadways in particular tend to induce growth at intensities that typically exceed un-serviced surrounding areas. When exercised judiciously, such capital improvement projects can guide growth and thus act as a powerful tool for promoting compatible land use around military installations.

Sewer Infrastructure

Facility Planning Areas (FPAs) are centralized sewer service areas within a specific geographic boundary used to ensure water quality. Each FPA has a designated management agency for collection, treatment and transport that must maintain the standards set by the Illinois Water Quality Management Plan. Wastewater treatment plants are located in each FPA, and permits are approved by the agency after considering the

capacity of current and planned treatment facilities. There are five FPAs within the study area, and two sub-FPAs. The five FPAs include Belleville Plant #1, Lebanon, Mascoutah, O'Fallon and Caseyville Township East. The sub-FPAs are for the Village of Shiloh, which has a sub-FPA to the O'Fallon FPA and the Belleville Plant #1 FPA. These sub-FPAs do not currently send any wastewater for treatment to the Belleville Plant, but O'Fallon treats wastewater from Shiloh-owned lines.

The City of Mascoutah recently placed trunk lines parallel to Route 4 just north of I-64. Lebanon placed sewer lines south along Route 4, just shy of Mascoutah lines. They plan to continue the lines pending approval of an Environmental Protection Agency 2% loan. The wetlands area west of Lebanon between O'Fallon serves as a natural delineation between the two cities. Other than the regulations pertaining to FPA boundaries, none of the cities in the study area has signed Joint

Agreements to determine future growth and annexations.

Transportation Infrastructure

Along with sewer and water infrastructure, the transportation network plays a major role in shaping the future development patterns of a community. Interstate 64 runs east-west from St. Louis through the study area, just north of Scott AFB and MidAmerica St. Louis Airport. Other major road corridors near the base and airport are Route 4, IL 161, and IL 158. Route 4 is oriented north-south just east of the airport. It intersects with I-64 at exit 23 and serves as the main entrance into MidAmerica St. Louis Airport.

IL 161 is oriented east-west and is directly south of both the base and the airport. IL 158 is oriented north-south and is directly east of Scott AFB. Also called Air Mobility Drive, this road serves as the main access into the base, and intersects with I-64 at Exit 19. Other major corridors in the study area include IL 177 through Mascoutah, Route 22 through Shiloh, and US 50 through Lebanon and O'Fallon.

Major projects such as new roads offer the strongest indicator of future development patterns. The East West Gateway Council of Governments is responsible for planning transportation projects in the St. Louis region, in which St. Clair County and the study area are located. Based on a review of the Long Range Transportation Plan Legacy 2035 and the Transportation Improvement Plan 2008-2011 several planned and potential projects that could induce shifts in future land uses include: the Gateway Connector, the Metrolink extension to MidAmerica St. Louis Airport and a new interchange along I-64 near Rieder Road.

The Gateway Connector is an outer loop around the St. Louis region, connecting I-255 in Monroe County to I-70 in Madison County, through St. Clair County and directly west of Scott AFB. The corridor utilizes the existing IL 158 Air Mobility Drive right-of-way and Exit 19 interchange with I-

64, therefore eliminating any realignment concerns. Providing much needed regional mobility among Monroe, St. Clair and Madison Counties will likely result in increased demand for commercial and highway services along the corridor. Interchanges, especially with existing interstates like Exit 19 at Air Mobility Drive will have the highest potential for future commercial development.

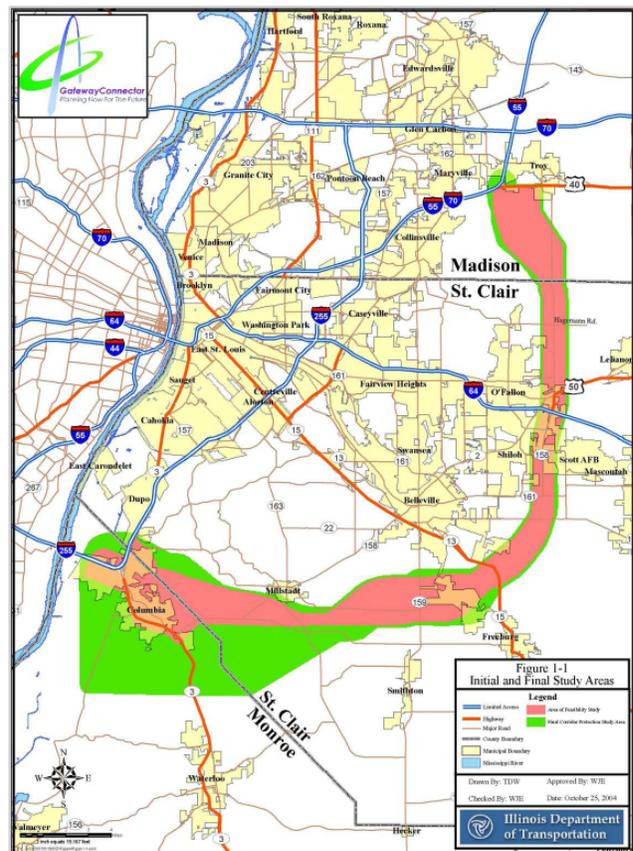


Figure 3- Gateway Connector Study Area

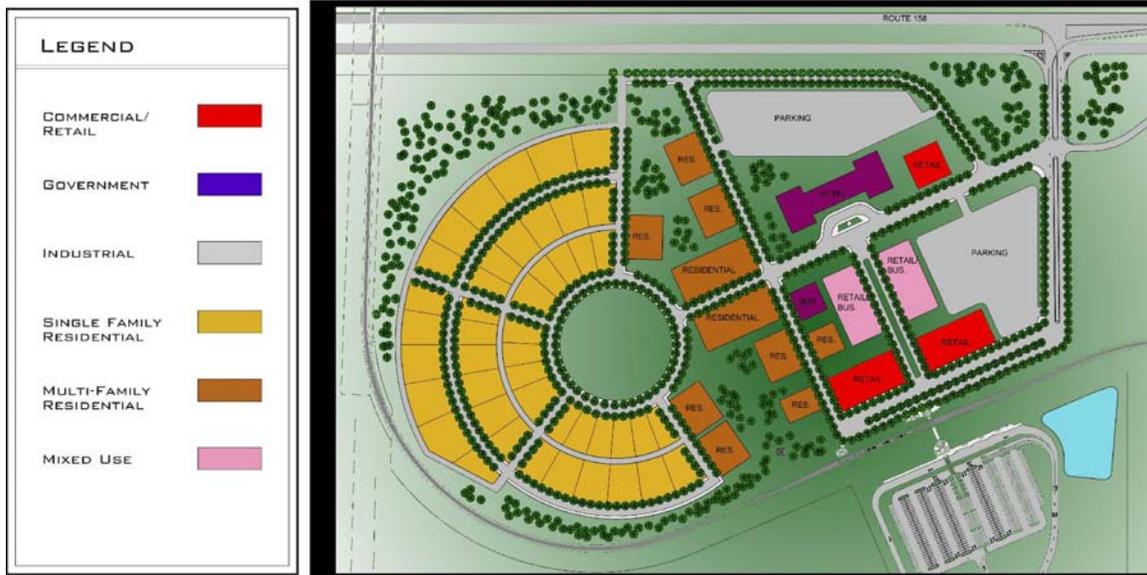


Figure 4- Proposed land use around the Scott AFB MetroLink Light Rail Station

The extension of MetroLink light rail may also affect land use around the base and airport, especially if the Station Area Plan seeks to maximize transit ridership by planning for more intense development within walking distance of the transit station.

The third transportation project that may influence land uses within the study area is the proposed new interchange on I-64 at Rieder Road, just north of Scott AFB. This project is in conceptual design only and has not been included in the Long Range Transportation Plan or three-year Transportation Improvement Plan (TIP 2008-2011).

During interviews, representatives with MidAmerica St. Louis Airport noted that the airport has one entry and exit point, Airport Boulevard, thus raising concerns over possible traffic delays and dangerous bottlenecks.

Water and Other Infrastructure

The Illinois-American Water Company (IAWC) provides drinking water for Scott AFB and the installation has no potable water wells. As a result of poor groundwater supplies, the IAWC uses the

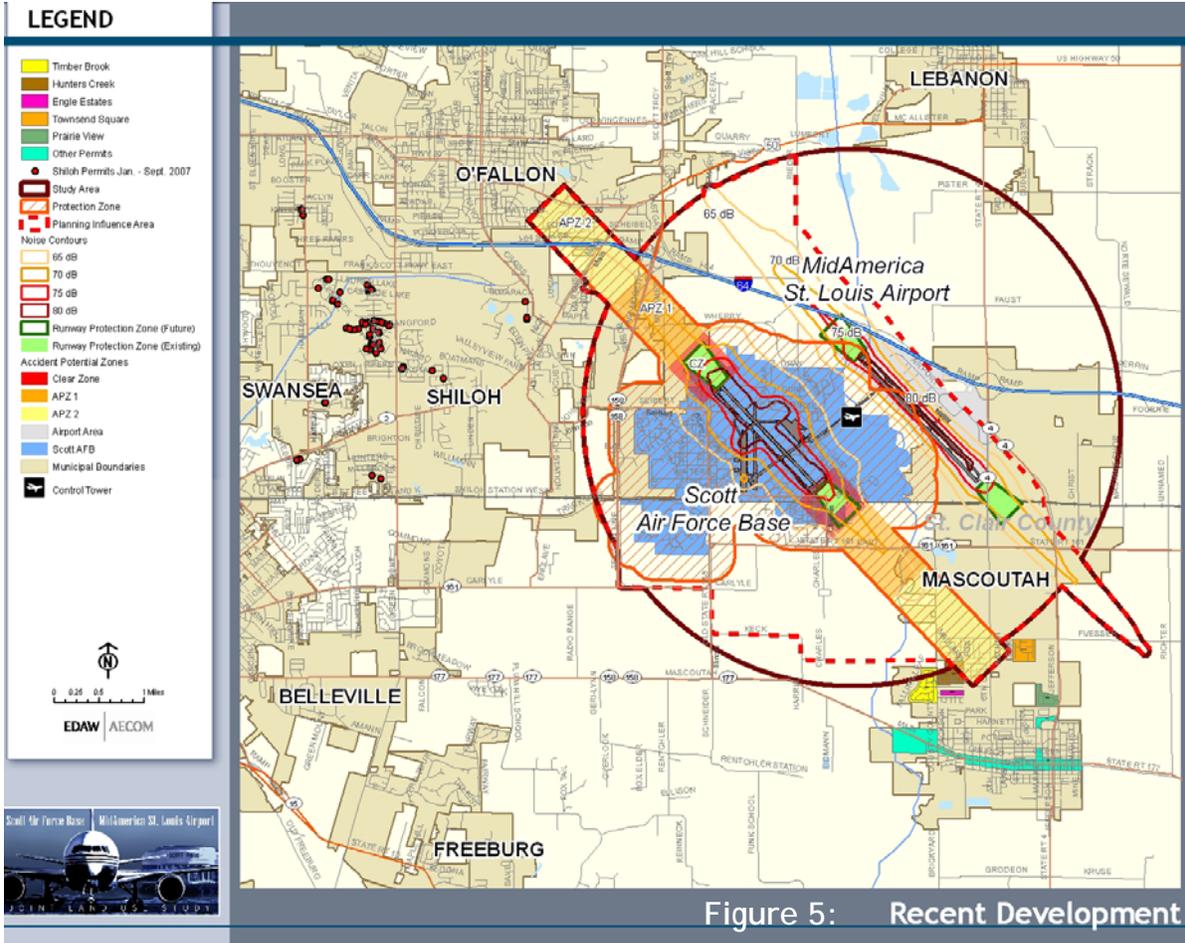
Mississippi River as its source of drinking water for services areas throughout Illinois.

IAWC also supplies water to a portion of the Village of Shiloh and the City of O'Fallon. Summerfield-Lebanon Mascoutah Water Commission (SLM) supplies water wholesale to Lebanon and Mascoutah. Mascoutah in turn provides water service to the MidAmerica St. Louis Airport.

Summary of Recent Development

Recent development activity is mostly focused west of the study area in O'Fallon and Belleville. A large commercial development recently opened in the Village of Shiloh along North Green Mount Road, Exit 18 on I-64 and west of Scott AFB. The Frank Scott Parkway was built parallel to I-64 and serves an array of commercial centers and hotels.

In O'Fallon, residential development is also more concentrated on the western side of the City, with over 3,000 planned or recently permitted homes. A 200 acre sports park is under construction on State Street, and most commercial development is west of the base between exits 14 through 16.



Lebanon growth is focused more along the northern side of the City and well to the north of both the base and the Airport. The Federal government is looking to build a warehouse for document storage along Route 4 near Faust Road. Family farms along Route 4 are active and see very little new development. Such homesteads, however, are likely to experience increased development pressure to convert into residential uses as the economics of farming shift.

To the south of the base and Airport, Mascoutah is another area of active development. Recent neighborhoods have sprouted from the fertile farm lands, especially along West Feusser Road. This growth has been accompanied by small pockets of new commercial development, but most of the commercial activity has occurred in the Village of Shiloh Green Mount Crossing development.

Figure 5 - *Recent Development*, shows the permit and development activity in the vicinity of the base since January 2007. The table below summarizes this permit activity.

Table 10: Recent Permit Activity

New Home Permits Since January 2007		
	Mascoutah Permits	Shiloh Permits
Hunters Creek	16	
Prairie View	29	
Townsend Square	19	
Timberbrook	36	
Engel Estates	5	
Other	6	
New Home Permits	111	80
Total		191

The figure shows that most of Shiloh's permit activity is located around the Green Mount commercial development and outside of the study area. Analyzing recent development activity reinforces the potential encroachment concern of residential development in Mascoutah in close proximity to the Scott runway APZ.

Regional Environment and Sustainability

Overview of Regional Resources

The gentle topography in the study area is typical of the Effingham Plain Section, which was formed by the most recent glacial period. Originally the land was mostly prairie interspersed with forests along major stream valleys and glacial ridges.

The JLUS study area is about 19 miles east of the Mississippi River, in the Kaskaskia Watershed, which drains to the Kaskaskia River and discharges to the Mississippi River near the Illinois/Missouri border. The Kaskaskia River is fed by local tributaries such as Ash Creek and Silver Creek. Ash Creek originates approximately one mile northwest of Scott AFB and flows through the installation before discharging into Loop Creek, a tributary of Silver Creek. Silver Creek originates 51 miles north of Scott AFB and MidAmerica St. Louis Airport in an agricultural area of Madison County before bisecting Scott AFB and the Airport.

Two separate 100-year floodplains, associated with Ash and Silver Creeks, exist in the JLUS study area. A wetland delineation and evaluation took place at Scott AFB in 1992, determining that a majority of the bottomland bordering Silver Creek, approximately 390 acres, is wetland (USAF 2004b).

Although much of Scott AFB is highly developed, remaining areas contain biological resources organized into three main groups consisting of: forested wetlands or bottomlands, uplands, and grasslands (USAF 2003). The Integrated Natural Resources Management Plan, completed for Scott

AFB in June 2003, details many of the biological resources on the installation, including a wide range of plants and animals, as well as a diverse array of ecological habitats. Scott AFB completed an Environmental Assessment of Selected Fauna and their Habitats in 2001. The assessment included bird surveys, bat surveys, and botanical surveys of the majority of the high quality habitats (USAERDC 2002).

Since many of these species are migratory and have large area habitats, the study assumed that these habitats extend beyond the borders of Scott AFB into MidAmerica St. Louis Airport and the surrounding communities. External entities have not performed specific studies of these species, although the Illinois Department of Natural Resources does conduct random monitoring of habitats and ecosystems through their Critical Trends Assessment Program (CTAP).

The Scott Air Force botanical survey did not identify the presence of any state or federally listed endangered/threatened plant species on the installation, although suitable habitats for these species do exist within Scott AFB boundaries. (USAERDC 2002). The survey identified the presence of the federally endangered Indiana bat (*Myotis sodalis*).

In addition to the Indiana Bat, studies have documented two state endangered bird species, as designated by the Illinois Endangered Species Protection Board (IESPB), both in 2001 and in 2004: the Snowy Egret (*Egretta thula*) and the Little Blue Heron (*Egretta caerulea*) (IESPB 2004).

Operational Impacts and Compatibility Guidelines

Routine training and readiness activities at Scott Air Force Base and daily operations at MidAmerica St. Louis Airport produce various impacts that can affect the quality of life in surrounding communities. Examples of these impacts include noise and vibration or the risk of an aircraft accident. Conversely, these military and airport operations are susceptible to hazards created by

certain proximate civilian activities that may concentrate people or noise sensitive users, obstruct air space, compete for electromagnetic spectrum use or generate light or other visual impairments. Understanding the overlapping spatial patterns of these impacts around the installation and airport is essential for promoting compatible and fully coordinated land use decisions.

The Air Force's Air Installation Compatible Use Zone Study (AICUZ, 2001) is the principle document for evaluating the noise footprint of Scott AFB and the hazards associated with military training operations. MidAmerica St. Louis Airport has not performed a similar FAA Noise Compatibility Study, Part 150 study, due to the low volume of flights. However, the 2001 Scott AFB AICUZ Study generated noise contours for MidAmerica. The Airport noise contours are based on military and civil aircraft operations

Aircraft Operations

The 2001 AICUZ Study updated the previous 1993 study with changes in military operations on Scott AFB, including the arrival of the KC-135E formal training program. It also accounted for changes in the length of both runways and flight patterns at MidAmerica St. Louis Airport.

According to the 2001 AICUZ, the majority of aircraft used at the two airports are C-9s, C-21s, KC-135s, Aero Club general aviation aircraft, or civilian passenger crafts like the B-727. C-9s are flown by the 11th Airlift Squadron. The C-9 is used for approximately two pilot training flights, which typically consist of multiple instrument departures and approaches, and two mission departures each day. The C-21s are flown by the 458th Airlift Squadron. These aircraft are used for one pilot training flight everyday and about two mission departures. These departures leave everyday from Scott AFB and proceed to another base. The KC-135E is flown by the 126th Air Refueling Wing (ARW). In addition to its air refueling mission

the 126th ARW provides formal aircrew training. Therefore, almost twice as many departures and landings occur using the KC-135 than other aircraft, for about four mission flights a day. Because some of these are training flights, multiple instrument departures and landings and circling approaches occur on the Scott AFB runway. Aircraft from the 126th Air Refueling Wing operated 260 days per year, or five days a week.

The Aero Club is a general aviation (GA) club for active and retired military. The Club operates three types of single engine and one twin engine aircraft, all of which are propeller driven. There are typically 50 or more daily GA flights a day.

MidAmerica St. Louis Airport supports three passenger service flights four days a week and two flights on the other three days of the week. Table 11 below summarizes the annual number of flight operations at MidAmerica St. Louis Airport only. A flight operation is defined as either one takeoff or one approach. A flight that arrives and unloads passengers, then re-loads passengers and departs is actually two flight operations. Table 12 summarizes all of the types of aviation activities on both runways.

Table 11: Airport Historical Operations

Year	Military	General Aviation	Air Carrier	Other	Total
1995	27,584	2,795	5	50	30,434
1998	24,600	6,356	5	42	31,003
1999	30,467	6,356	5	42	36,870
2000	30,467	6,356	240	42	37,105
2005	30,467	7,189	320	57	38,003

Source: St. Louis Regional Aviation System Study, 2007 and FAA Terminal Area Forecasts

Table 12: Historical Annual Operations by Type on Both Runways

Historical Annual Operations by Type – Combined Airfield

Year	Air Carrier	Military	General Aviation	Total
1998	17	15,198	3,149	18,364
1999	133	26,704	4,290	31,127
2000	425	26,094	3,644	30,163
2001	561	16,524	2,471	19,556
2002	37	18,867	2,821	21,725
2003	890	24,386	6,689	31,945
2004	548	21,237	8,312	30,097
2005	345	19,671	8,710	28,726
2006	485	19,865	10,689	31,039

Source: FAA Terminal Area Forecast, MidAmerica St. Louis Airport Operations Data
Prepared by: Ricordo & Associates, Inc.

Noise Contours

Military success is achieved through realistic training. To prepare aviators for their military mission, Scott AFB must conduct high-quality training throughout the year. The 375th Airlift Wing typically operates aircraft on a 365 days-per-year basis, or seven days a week. A natural by-product of this training is noise.

Noise is unwanted sound. In a world of constant natural and manmade sounds, those sounds perceived as noise vary among people in the community. Noise generated at Scott AFB and MidAmerica St. Louis Airport emanates from fixed-wing civil and military aircraft. BRAC will increase the number of military personnel on Scott AFB, but no increase in aircraft noise is expected at this time.

Day-Night Sound Level and Decibels

To measure environmental noise, the Department of Defense (DoD) and the Federal Aviation Administration (FAA) use a widely accepted evaluator, the day-night sound level (DNL). The DNL evaluator describes the average daily acoustic energy over the period of one year—meaning that it averages moments of quiet with moments where loud noises can be heard. It is important to note that the 2001 AICUZ Study uses the DNL for both the civilian and military airports.

Noise levels are measured in terms of a quantity known as decibels (dB). Normal speech has a noise level of approximately 60 dBA and a busy street corner has a noise level of approximately 80 dBA. Table 13 below expresses common sound levels in dBA for comparison.

Table 13. Comparable Noise Levels

SOUND	dBA	EFFECT
Jet Engines (Near)	140	
Shotgun Firing	130	
Jet Takeoff (100-200 Fort)	130	Threshold of pain (125 dBA)
Thunderclap (Near)	120	Threshold of sensation (120 dBA)
Power Saw (Chain Saw)	110	
Jet Fly-over (1000 Fort)	103	
Garbage Truck/Cement Mixer	100	Regular exposure for 1 minute or more risks permanent hearing loss
Farm Tractor	98	
Lawnmower, Food Blender	85-90	Level at which hearing loss begins (8 hour exposure)
Recreational Vehicles, TV	70-90	
Diesel Truck (40 Mph, 50 Fort)	84	
Garbage Disposal	80	Annoyance; constant exposure may cause hearing loss
Washing Machine	78	
Dishwasher	75	
Vacuum Cleaner	70	Intrusive, interference with conversation
Hair Dryer	70	
Normal Conversation	60-65	Comfortable (under 60 dBA)
Refrigerator Humming	40	
Whisper	30	Very quiet
Rustling Leaves	20	Just audible
Normal Breathing	10	
	0	Threshold of normal hearing (1000-4000 Hz)

Source: Adopted from the National Institute of Deafness and Other Communication Disorders

Noise Zones

To assist the surrounding communities in land use decisions, the DoD and the FAA use decibel noise contours to illustrate the exposure to noise associated with aviation activities. Below is a general definition of these zones:

- **Noise Zone III** :This is an area around the source of noise in which the DNL is greater than 75 dBA. This zone is considered an area of severe noise exposure and is deemed unacceptable for noise sensitive activities.
- **Noise Zone II** :This area is considered to have significant noise exposure and is normally unacceptable for noise-sensitive land uses. It consists of an area where the DNL is between 65 and 75 dBA.
- **Noise Zone I** :This area, considered to have minimal noise exposure, includes areas in which DNL is less than 65dBA and is acceptable for all types of land uses.

Noise Contours around Scott AFB and the Airport

The Noise Contours created in the 2001 AICUZ Study account for current activity on both the Scott AFB runway and the MidAmerica St. Louis Airport runway. BRAC activities will not impact aviation activity levels at Scott AFB.

Figure 6 - *Noise Zones- Accident Potential Zones*, shows the noise contours around the two runways. The DNL 65 dB noise contour for Scott AFB extends about 1.7 miles to the southeast from the runway into Mascoutah and 1.8 miles to the northwest into Shiloh and O'Fallon. The same noise contour for MidAmerica St. Louis Airport extends 2.8 miles to the southeast across Mascoutah and 2.4 miles northwest into unincorporated St. Clair County.

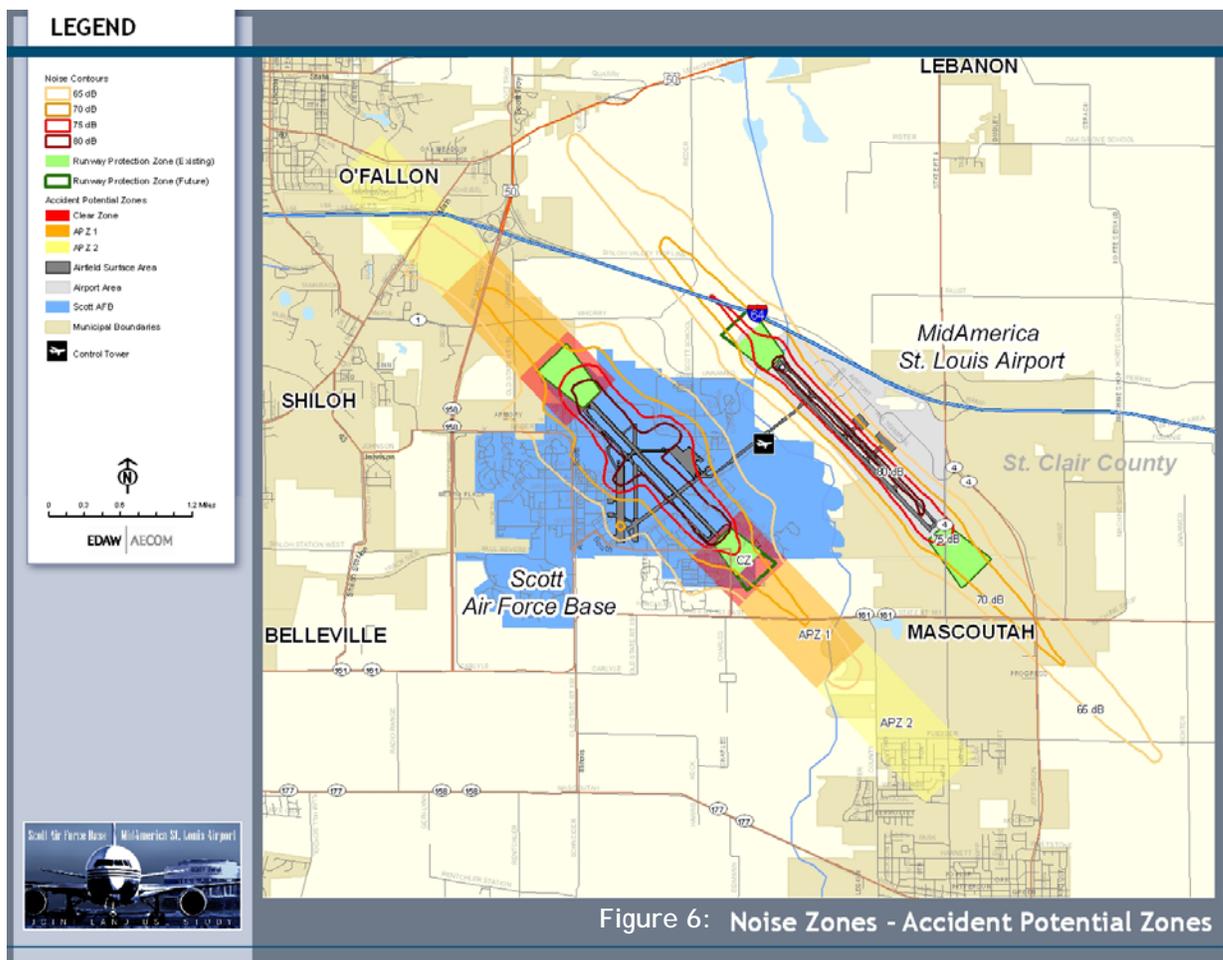


Figure 6: Noise Zones - Accident Potential Zones

Runway Airspace Imaginary Surfaces

Imaginary surfaces are three-dimensional areas around airfields that define the spaces that must be kept clear of obstacles to ensure safe aviation. The Department of Defense (DoD) and the Federal Aviation Administration (FAA) have differing sets of airspace surfaces, due in part to the types of aircraft in use.

Military Clear Zones and Accident Potential Zones

Clear Zones (CZ) and Accident Potential Zones (APZ) are established near military airfields based on the analysis of military aircraft accident history and a determination of where, within airfield environs, an accident is likely to take place and how large an impact area is likely to result from any single accident.

- The Clear Zone (CZ) is located at the end of the runway, extends outward 3,000 feet, and is 1,500 feet on either side of the runway centerline. The accident potential in this area is so high that all structures are incompatible.
- Accident Potential Zone I (APZ I) is less critical than the CZ, but still possesses significant potential for accidents. Located just beyond the CZ, APZ I extends an additional 5,000 feet from the end of the CZ. Like all runway zones, the APZ I is 3,000 feet wide.
- Accident Potential Zone II (APZ II) extends beyond APZ I, is less critical than APZ I, but still poses some risk for accidents. The APZ II extends 7,000 feet from the end of APZ I.

Figure 6 - *Noise Zones- Accident Potential Zones*, shows the Clear Zones and APZs associated with Scott Air Force Base. All three zones extend outside the installation boundary fence.

FAA Runway Protection Zones

The Runway Protection Zone (RPZ) is defined as an area off the runway end intended to protect people and property on the ground. The RPZ is trapezoidal in shape, centered about the extended

runway centerline, and starts 200 feet after the end of the runway. Not all RPZs are the same size, since they reflect the aircraft in use on the runway. The MidAmerica St. Louis Airport RPZs are 2,500 feet long and end 2,700 feet from the end of the runway. The narrow width closest to the runway is 1,000 feet and the width farthest from the runway is 1,750 feet.

Figure 6- *Noise Zones- Accident Potential Zones*, depicts the RPZ for MidAmerica St. Louis Airport. The Airport or Scott AFB owns all land within the Airport RPZs and the property contains no incompatible uses or structures.

Other Surfaces

Figures 7- *MidAmerica St. Louis Airport Imaginary Surfaces*, and Figure 8- *Scott AFB Imaginary Surfaces and Glideslope*, is a graphic of the 3-D model of the Scott AFB/Airport aerodrome, including glide angles over the APZ and FAA clear zones produced for the JLUS. These surfaces are defined in the FAA Part 77 regulations and differ between the military and civilian runways. The 3-D model is in GIS format (Geographic Information System). The 3-D model is used in Part 2, *Recommendations and Implementation*, to assist identifying height limitations to protect navigable air space around the two air fields. The military airport imaginary surfaces include:

- Primary Surface - Symmetrically centered on the runway, extending 200 feet beyond each runway end. The width of the primary surface is 2,000 feet or 1,000 feet on each side of the runway centerline.
- Approach-Departure Clearance Surface - symmetrically centered on the extended runway centerline, beginning at the end of the primary surface, and extending horizontally for 50,000 feet. The slope of the approach-departure clearance surface is 50:1 until it reaches an elevation of 500 feet about the established airfield elevation. It then continues horizontally at this elevation to a point 50,000 feet from the starting point. The width of this

- surface at the runway end is 200 feet; flaring uniformly to a width of 16,000 feet at the 50,000 foot point where it stays a uniform 16,000 feet.
- Inner Horizontal Surface - An oval plane at a height of 150 feet above the established airfield elevation. The inner boundary intersects with the approach-departure clearance surface and the transitional surface. The outer boundary is formed by scribing arcs with a radius 7,500 feet from the centerline of each runway end and interconnecting these arcs with tangents.
 - Conical Surface - Extends outward and upward at a slope of 20:1 from the outer periphery of the inner horizontal surface for a horizontal distance of 7,000 feet to a height of 500 feet above the established airfield elevation.
 - Outer Horizontal Surface - Located 500 feet above the established airfield elevation and extends outward from the outer periphery of the conical surface for a horizontal distance of 30,000 feet.
 - Transitional Surface - Extends outward and upward at right angles to the runway centerline and extended runway centerline at a slope of 7:1 (7 feet horizontally for every vertical foot). The transitional surface connects the primary and the approach-departure clearance surfaces to the inner horizontal, the conical, and the outer horizontal surfaces.

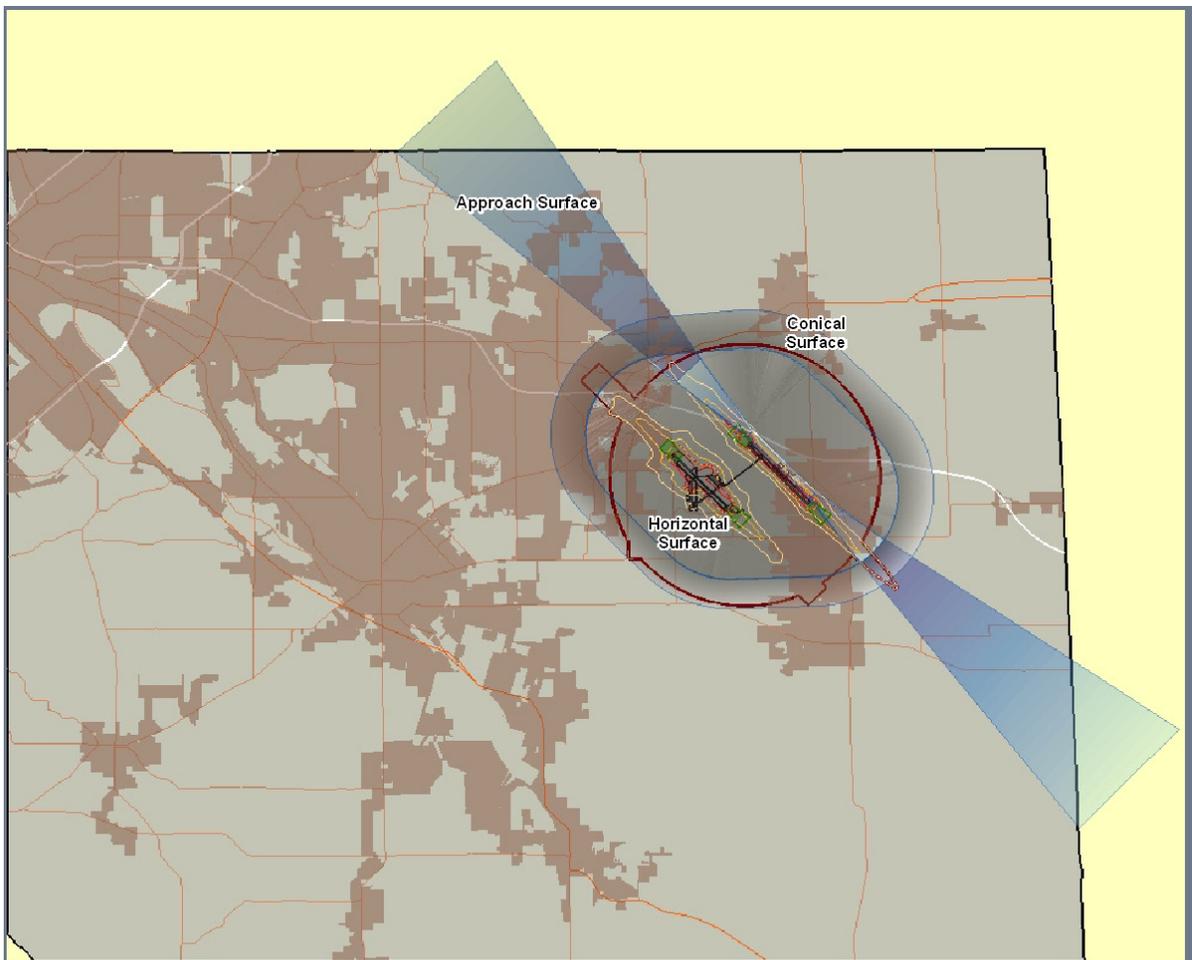
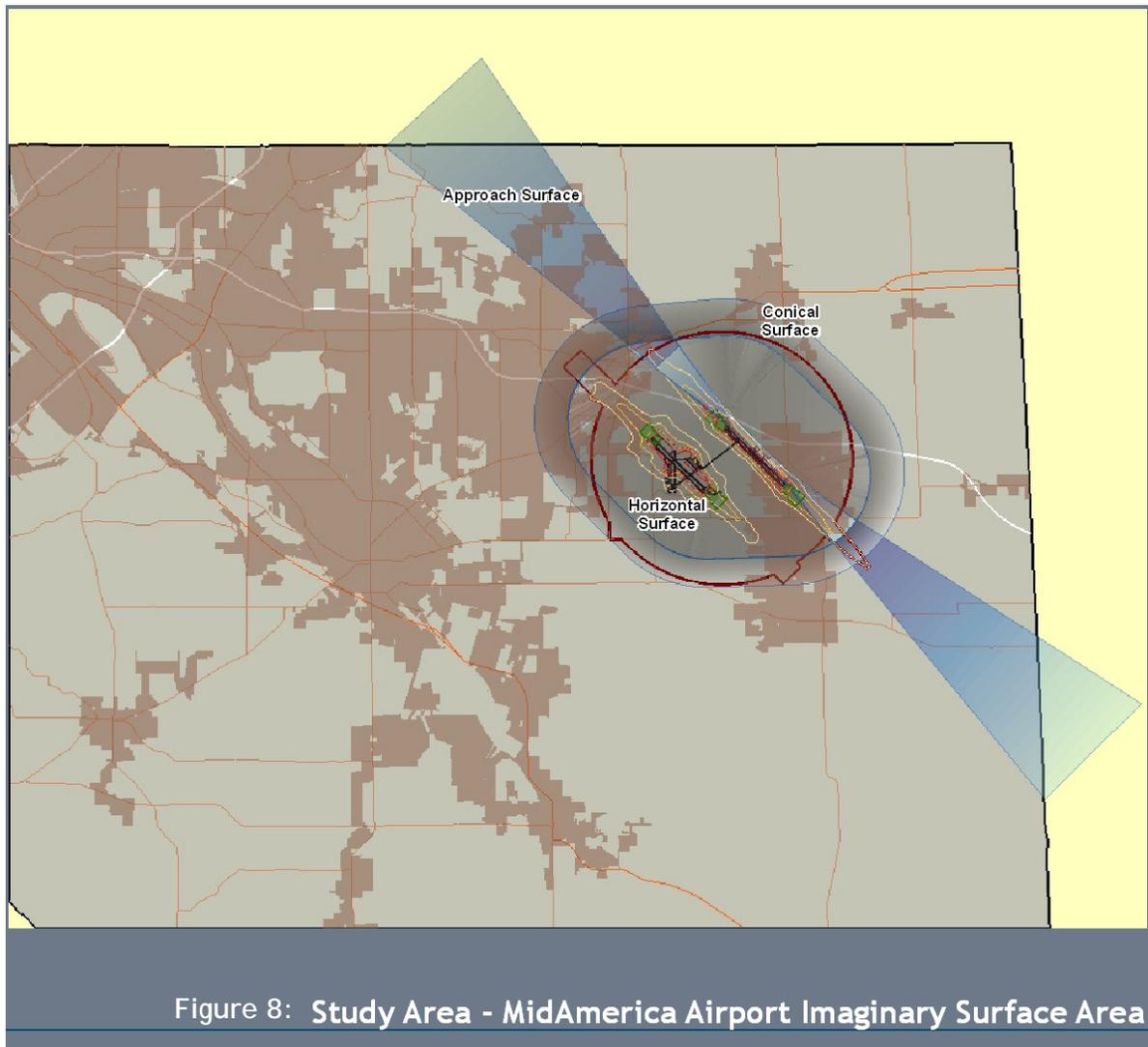


Figure 7: Study Area - MidAmerica Airport Imaginary Surface Area



The civilian airport imaginary surfaces vary slightly from the military surfaces in that there are fewer surfaces and some measurements differ. The civilian airport surfaces include:

- Primary Surface - Symmetrically centered on the runway, extending 200 feet beyond each runway end. The width of the primary surface is 2,000 feet or 1,000 feet on each side of the runway centerline.
- Approach-Departure Clearance Surface - symmetrically centered on the extended runway centerline, beginning at the end of the primary surface, and extending horizontally for 5,000 feet. The slope of the approach-departure clearance surface is 20:1 until it reaches a width of 16,000 feet.
- Horizontal Surface - An oval plane at a height of 150 feet above the established airfield elevation. The outer boundary is formed by scribing arcs with a radius 10,000 feet from the centerline of each runway end and interconnecting these arcs with tangents.
- Conical Surface - Extends outward and upward at a slope of 20:1 from the outer periphery of the Horizontal Surface for a horizontal distance of 4,000 feet.
- Transitional Surface - Extends outward and upward at right angles to the runway centerline and extended runway centerline at a slope of 7:1 (7 feet horizontally for every vertical foot). The transitional surface connects the primary and the approach-departure clearance

surfaces to the horizontal and the conical surfaces.

Compatibility Guidelines

Encroachment occurs when physically adjacent military and civilian land uses generate one or both of the following effects:

- Nearby community development interferes with the ability of the military or the airport to perform its mission or causes modifications to military or airport operating procedures; or
- Members of the public are exposed to a higher than normal levels of operational impacts, such as noise or the risk of an aircraft mishap.

When compatible, land uses can exist next to each other without causing interference with military exercises or exposing people to undue safety risks or nuisance. In this JLUS context, aviation activities raise compatibility issues when next to the following nearby land uses:

- Noise sensitive uses, such as housing, schools, medical facilities or places of worship;
- Uses that concentrate people (certain higher residential densities, schools, theaters);
- Uses that can interfere with safe air navigation, such as tall structures, or activities that throw off excessive lighting, smoke or dust and may impair vision; and/or
- Uses which attract birds and other wildlife that can interfere with safe aviation.

For purposes of evaluating compatibility in designated noise and air safety zones, the JLUS draws guidance from The Air Force Handbook 32-7084, 1 MARCH 1999, AICUZ Program Manager's Guide as shown in Table 14 on the following pages. Uses shown in green are compatible with the level of noise exposure or safety risk associated with each particular zone. Use depicted in yellow are conditionally compatible and may require further protection measures, such as indoor noise reduction. Activities shown in red are unacceptable within the given zones, indicating that strict prohibition of the use is the most appropriate regulatory action. These guidelines are only advisory in nature. Only local governments

retain the authority to determine land uses around an installation. Section 2 contains specific recommendations for uses as proposed by the Working Group.

While aircraft noise and air safety hazards are the major operational issues generated by Scott Air Force Base and the Airport, impacts from the surrounding community can also interfere with military training or civilian airport operations.

Air Space Intrusion

Cell towers can act as a physical intrusion into active air space, particularly for aircraft participating in low altitude operations.

Communications towers may also be a source of electromagnetic 'noise,' which may affect military avionics and radio frequency (RF) dependant weapons systems and communications.

Radio Frequency Spectrum

Adequate radio frequency spectrum is essential to almost all aviation operations. Civilian radio frequency devices (ex., radios, radars, keyless entry devices) can sometimes transmit in military assigned frequencies, affecting electronic systems and communications equipment.

Exterior Lighting

Outdoor lighting systems, especially interstate interchange streetlights or exterior security lighting associated with large buildings often allow significant light to travel upward into an otherwise darkened sky. The resulting "light pollution" can obscure pilot vision or interfere with the use of night vision training devices.

Night vision flight training, in which aviators use night vision goggles (NVGs) or other types of night vision systems, is essential to the missions of the modern military. Night vision systems are designed to operate away from civilization and electric lighting. Exposure to stray light can cause the vision screen to white-out, temporarily robbing the aviator of vision. In some cases, light pollution can hinder night training resulting in a relocation of training routes or rendering it feasible.

Table 14: AICUZ Land Use Compatibility Table

LAND USE		ACCIDENT POTENTIAL ZONES			NOISE ZONES (dB)			
SLUCM NO.	NAME	CLEAR ZONE	APZ 1	APZ 2	65-69	70-74	75-79	80+
10	Residential							
11	Household units							
11.11	Single units; detached	N	N	Y ¹	A ¹¹	B ¹¹	N	N
11.12	Single units; semi detached	N	N	N	A ¹¹	B ¹¹	N	N
11.13	Single units; attached row	N	N	N	A ¹¹	B ¹¹	N	N
11.21	Two units; side-by-side	N	N	N	A ¹¹	B ¹¹	N	N
11.22	Two units; stacked	N	N	N	A ¹¹	B ¹¹	N	N
11.31	Apartments; walk up	N	N	N	A ¹¹	B ¹¹	N	N
11.32	Apartments; elevator	N	N	N	A ¹¹	B ¹¹	N	N
12	Group quarters	N	N	N	A ¹¹	B ¹¹	N	N
13	Residential hotels	N	N	N	A ¹¹	B ¹¹	N	N
14	Mobile home parks or courts	N	N	N	N	N	C ¹¹	N
15	Transient lodgings	N	N	N	A ¹¹	B ¹¹	N	N
16	Other residential	N	N	N ¹	A ¹¹	B ¹¹	N	N
20	Manufacturing							
21	Food & kindred products; manufacturing	N	N ²	Y	Y	Y ¹²	Y ¹³	Y ¹⁴
22	Textile mill products; manufacturing	N	N ²	Y	Y	Y ¹²	Y ¹³	Y ¹⁴
23	Apparel and other finished products made from fabrics, leather, and similar materials; manufacturing	N	N	N ²	Y	Y ¹²	Y ¹³	Y ¹⁴
24	Lumber and wood products (except furniture); manufacturing	N	Y ²	Y	Y	Y ¹²	Y ¹³	Y ¹⁴
25	Furniture and fixtures; manufacturing	N	Y ²	Y	Y	Y ¹²	Y ¹³	Y ¹⁴
26	Paper & allied products; manufacturing	N	Y ²	Y	Y	Y ¹²	Y ¹³	Y ¹⁴
27	Printing, publishing, and allied industries	N	Y ²	Y	Y	Y ¹²	Y ¹³	Y ¹⁴
28	Chemicals and allied products; manufacturing	N	N	N ²	Y	Y ¹²	Y ¹³	Y ¹⁴
29	Petroleum refining and related industries	N	N	N	Y	Y ¹²	Y ¹³	Y ¹⁴

LAND USE		ACCIDENT POTENTIAL ZONES			NOISE ZONES (dB)			
SLUCM NO.	NAME	CLEAR ZONE	APZ 1	APZ 2	65-69	70-74	75-79	80+
30	Manufacturing							
31	Rubber and miscellaneous plastic products	N	N ²	N ²	Y	Y ¹²	Y ¹³	Y ¹⁴
32	Stone, clay and glass products	N	N ²	Y	Y	Y ¹²	Y ¹³	Y ¹⁴
33	Primary metal industries	N	N ²	Y	Y	Y ¹²	Y ¹³	Y ¹⁴
34	Fabricated metal products	N	N ²	Y	Y	Y ¹²	Y ¹³	Y ¹⁴
35	Professional, scientific, and controlling instruments; photographic and optical goods; watches and clocks	N	N	N ²	Y	A	B	N
39	Miscellaneous manufacturing	N	Y ²	Y ²	Y	Y ¹²	Y ¹³	Y ¹⁴
40	Transportation, communications and utilities							
41	Railroad, rapid rail transit and street railroad transportation	N ³	Y ⁴	Y	Y	Y ¹²	Y ¹³	Y ¹⁴
42	Motor vehicle transportation	N ³	Y	Y	Y	Y ¹²	Y ¹³	Y ¹⁴
43	Aircraft transportation	N ³	Y ⁴	Y	Y	Y ¹²	Y ¹³	Y ¹⁴
44	Marine craft transportation	N ³	Y ⁴	Y	Y	Y ¹²	Y ¹³	Y ¹⁴
45	Highway & street right-way	N ³	Y	Y	Y	Y ¹²	Y ¹³	Y ¹⁴
46	Automobile parking	N ³	Y ⁴	Y	Y	Y ¹²	Y ¹³	Y ¹⁴
47	Communications	N ³	Y ⁴	Y	Y	A ¹⁵	B ¹⁵	N
48	Utilities	N ³	Y ⁴	Y	Y	Y	Y ¹²	Y ¹³
49	Other transportation communications and utilities	N ³	Y ⁴	Y	Y	A ¹⁵	B ¹⁵	N
50	Trade							
51	Wholesale trade	N	Y ²	Y	Y	Y ¹²	Y ¹³	Y ¹⁴
52	Retail trade-building materials, hardware and farm equipment	N	Y ²	Y	Y	Y ¹²	Y ¹³	Y ¹⁴
53	Retail trade- general merchandise	N	N ²	Y ²	Y	A	B	N
54	Retail trade- food	N	N ²	Y ²	Y	A	B	N
55	Retail trade- automotive, marine craft, aircraft and accessories	N	Y ²	Y ²	Y	A	B	N
56	Retail trade- apparel and accessories	N	N ²	Y ²	Y	A	B	N
57	Retail trade- furniture, home furnishings and equipment	N	N ²	Y ²	Y	A	B	N
58	Retail trade- eating and drinking establishments	N	N	N ²	Y	A	B	N
59	Other retail trade	N	N ²	Y ²	Y	A	B	N

LAND USE		ACCIDENT POTENTIAL ZONES			NOISE ZONES (dB)			
SLUCM NO.	NAME	CLEAR ZONE	APZ 1	APZ 2	65-69	70-74	75-79	80+
60	Services							
61	Finance, insurance and real estate services	N	N	Y ⁶	Y	A	B	N
62	Personal services	N	N	Y ⁶	Y	A	B	N
62.4	Cemeteries	N	Y ⁷	Y ⁷	Y	Y ¹²	Y ¹³	Y ^{14, 21}
63	Business services	N	Y ⁸	Y ⁸	Y	A	B	N
64	Repair services	N	Y ²	Y	Y	Y ¹²	Y ¹³	Y ¹⁴
65	Professional services	N	N	Y ⁶	Y	A	B	N
65.1	Hospitals, nursing homes	N	N	N	A*	B*	N	N
65.1	Other medical facilities	N	N	N	Y	A	B	N
66	Contract construction services	N	Y ⁶	Y	Y	A	B	N
67	Governmental services	N	N	Y ⁶	Y*	A*	B*	N
68	Educational services	N	N	N	A*	B*	N	N
69	Miscellaneous services	N	N ²	Y ²	Y	A	B	N
70	Cultural, entertainment and recreational							
71	Cultural activities (including churches)	N	N	N ²	A*	B*	N	N
71.2	Nature exhibits	N	Y ²	Y	Y*	N	N	N
72	Public assembly	N	N	N	Y	N	N	N
72.1	Auditoriums, concert halls	N	N	N	A	B	N	N
72.11	Outdoor music shell, amphitheaters	N	N	N	N	N	N	N
72.2	Outdoor sport arenas, spectator sports	N	N	N	Y ¹⁷	Y ¹⁷	N	N
73	Amusements	N	N	Y ⁸	Y	Y	N	N
74	Recreational activities (including golf courses, riding stables, water recreation)	N	Y ^{8, 9, 10}	Y	Y*	A*	B*	N
75	Resorts and group camps	N	N	N	Y*	Y*	N	N
76	Parks	N	Y ⁸	Y ⁸	Y*	Y*	N	N
79	Other cultural, entertainment and recreation	N	Y ⁹	Y ⁹	Y*	Y*	N	N
80	Resources production and extraction							
81	Agriculture (except livestock)	Y ¹⁶	Y	Y	Y ¹⁸	Y ¹⁹	Y ²⁰	Y ^{20, 21}
81.5-- 81.7	Livestock farming and animal breeding	N	Y	Y	Y ¹⁸	Y ¹⁹	Y ²⁰	Y ^{20, 21}
82	Agricultural related activities	N	Y ⁵	Y	Y ¹⁸	Y ¹⁹	Y ²⁰	N
83	Foresry activities and related services	N ⁵	Y	Y	Y ¹⁸	Y ¹⁹	Y ²⁰	Y ^{20, 21}
84	Fishing activities and related services	N ⁵	Y ⁵	Y	Y	Y	Y	Y
85	Minine activities and related services	N	Y ⁵	Y	Y	Y	Y	Y
89	Other resources production and extraction	N	Y ⁵	Y	Y	Y	Y	Y

Table 14: Footnotes

SLUCM - Standard Land Use Coding Manual, U.S. Department of Transportation.

Y - (Yes) - Land use and related structures are compatible without restriction.

N - (No) - Land use and related structures are not compatible and should be prohibited.

Y^x - (yes with restrictions) - Land use and related structures generally compatible; see notes indicated by the superscript.

N^x - (no with exceptions) - See notes indicated by the superscript.

NLR - (Noise Level Reduction) - NLR (outdoor to indoor) to be achieved through incorporation of noise attenuation measures A, B, or C - Land use and related structures generally compatible; measures to achieve NLR for A(DNL/CNEL 65-69), B(DNL/CNEL 70-74), C(DNL/CNEL 75-79), need to be incorporated into the design and construction of structures.

A*, B*, and C* - Land use generally compatible with NLR. However, measures to achieve an overall noise level reduction do not necessarily solve noise difficulties and additional evaluation is warranted. See appropriate footnotes.

* - The designation of these uses as "compatible" in this zone reflects federal agencies' and program considerations of general cost and feasibility, as well as past community experiences. Localities, when evaluating the application of these guidelines to specific situations, may have different concerns or goals to consider.

1. Suggested maximum density of 1-2 dwelling units per acre, possibly increased under a Planned Unit Development (PUD) where maximum lot coverage is less than 20 percent.
2. Within each land use category, further deliberating by local authorities may be needed due to the variation. Shopping malls and shopping centers are considered incompatible use in any accident potential zone (CZ < APX 1, or APZ 2).
3. The placing of structures above-ground utility lines in the clear zone is subject to sever restrictions
4. No passenger terminals and no major above-ground transmission lines in APZ 1.
5. Factors to be considered: labor intensity, structural coverage, explosive characteristics, and air pollution.
6. Low-intensity office uses only. Meeting places, auditoriums, etc., are not recommended.
7. Excludes chapels.
8. Facilitates must be low intensity.
9. Clubhouses not recommended.
10. Areas for gatherings of people are not recommended.
11.
 - a. Although local conditions may require residential use, it is discouraged in DNL/ CNEL 65-69 dB and strongly discouraged in DNL/CNEL 70-74 dB. The absence of viable alternative development options should be determined and an evaluation indicating a demonstrated community need for residential use would both be met if development were prohibited in these zones should be conducted prior to approvals.
 - b. Where the community determines the residential uses must be allowed, measures to achieve outdoor to indoor Noise Level Reduction (NRL) for DNL/CNEL 65-69 dB and DNL/CNEL 70-74 dB should be incorporated.
 - c. NRL criteria will not eliminate outdoor noise problems. However, building location and site planning can help mitigate outdoor exposure, particularly from near ground level sources. Measures that reduce outdoor noise should be used whenever practical in preference to measures which only protect interior spaces.
12. Measures to achieve the same NRL as required for facilities in DNL/CNEL 65-69 dB range much be incorporated into the design and construction of portions of these buildings where the public is received, office areas, noise sensitive areas or where the normal noise level is low.
13. Measures to achieve the same NRL as required for facilities in DNL/CNEL 70-74 dB range much be incorporated into the design and construction of portions of these buildings where the public is received, office areas, noise sensitive areas or where the normal noise level is low
14. Measures to achieve the same NRL as required for facilities in DNL/CNEL 75-79 dB range much be incorporated into the design and construction of portions of these buildings where the public is received, office areas, noise sensitive areas or where the normal noise level is low
15. If noise sensitive, use indicated NRL; if not, the use is compatible.
16. No buildings.
17. Land use is compatible provided special sound reinforcement systems are installed.
18. Residential buildings require the same NLR as required for facilities in DNL/CNEL 65-69 dB range.
19. Residential buildings require the same NLR as required for facilities in DNL/CNEL 70-74 dB range.
20. Residential buildings are not permitted
21. Land use is not recommended. If the community decides the use is necessary, hearing protection devices should be worn by personnel.

Current Local Government Compatibility Tools

Overall, a review of current local policies clearly indicates that each of the jurisdictions directly affected by the joint use airports has begun to address compatible land use planning. Each of the local jurisdictions, except the City of Lebanon which has no noise or safety constrained property within its jurisdiction, has adopted a form of an Airport Overlay. Some jurisdictions have adopted other tools, such as lighting standards to reduce glare for night vision flight training.

Below is a summary of each jurisdiction's airport overlay, adopted Comprehensive Plans, and other tools, as well as a summary table of all ordinances currently in place.

Airport Overlay Ordinance

St. Clair County, O'Fallon, Mascoutah and the Village of Shiloh have all adopted an Airport Overlay ordinance addressing land use planning and noise attenuation within the 65 L_{dn} Noise Zone. Most of the codes seek to define incompatible uses as those activities that could interfere with airport operations or aircraft maneuvering. The St. Clair County and Shiloh overlays affect lands within the 1991 65 L_{dn} Noise Zone, while the O'Fallon and Mascoutah overlays are tied to the most recent 2001 65 L_{dn} Noise Zone, and allow for updates. O'Fallon and Mascoutah enable, but do not require, Avigation Easements as part of approval of a rezoning, variance, or a special use permit request. A summary table comparing local regulatory codes is included below.

St. Clair County

The Airport Overlay Ordinance includes all lands within the 65 L_{dn} Noise Zone of Scott AFB and the MidAmerica St. Louis Airport that are not incorporated into municipalities. The regulations are based on the 1991 AICUZ Study. (This study was updated in 2001, but the zoning code does not reflect this).

The underlying zoning of all lands in the overlay is "A, Agricultural Industry District." Permitted uses include basic agricultural production, livestock husbandry, and forestry operations. Also permitted uses that could be considered encroachment are colleges and universities, schools, billboards, and growing of crops that could attract fowl.

There is a general statement that land use controls are based on the need to limit incompatible uses. Although no definition of incompatibility is included, the code lists specific prohibited uses. The code states that airport accessory and ancillary uses are permitted; however, the ability to apply for a Special Use Permit could introduce some ambiguity into the assessment of incompatible uses. The Airport Overlay Zone allows Special Use Permits for uses that are permitted in "HB, Highway Business", "B-1 and B-2, Business District", and "I-1, Industrial District", that are not specifically prohibited previously in the code, but could pose a threat to the airport. Some examples of potentially conflicting land uses are: bowling alleys, churches, funeral chapels, colleges and universities, auditoriums, and theaters.

After listing permitted and prohibited land uses, Section 40-4-110 of the Overlay grants general guidance for land use decisions, whether explicitly permitted or not, that includes radio interference, light glare, bird strike hazard or interference with landing and maneuvering.

The Airport Overlay Ordinance continues with Noise Attenuation Requirements based on land use for all properties within the 1991 65 L_{dn} Noise Zone. Overall, the Airport Overlay has several areas that could be further refined:

- Based on the 1991 65 L_{dn} Noise Zone, which shrunk with the 2001 update.
- Does not define incompatible land uses or encroachment, but does include some indication within the code in Section 40-4-110.

- Does not differentiate between land located in the Clear Zones, Accident Potential Zones, and higher L_{dn} Noise Zones.
- The permitted and prohibited land uses combine three codes: the underlying zone, the special use permits for commercial and industrial zones, and the land uses contained in the Noise Attenuation Compatibility Table.

Each of these issues can be easily addressed by updating the Noise Contours to the most recent set, and adding a definition of compatible or incompatible land uses. Greater specificity of impacts can be addressed by referring to higher L_{dn} Noise Zones, APZ, and RPZ and Clear Zones. Finally, permitted / prohibited land uses within each zone and noise attenuation requirements should be consolidated into one table.

City of O'Fallon

Lands within the 65 L_{dn} and higher noise contours, Clear Zones, APZ I and II, height hazard zones, and airport property are all part of the Airport Environs Overlay Zone (AEO). The City of O'Fallon uses military APZ on both the civilian and military runway. The AEO is divided into two sub-districts: AEO1, Airport Zone and AEO2, Airport Compatible Use Zone. All Airport property holdings are in the AEO1 Zone, everything else is in the AEO2 Zone.

The Ordinance begins with guidance for incompatible land uses, similar to the St. Clair Section 40-4-110, with the notable exception of bird strike prevention. Following this definition is the permitted uses and noise reduction requirements within AEO1 and AEO2. Guidance closely follows existing federal land use compatibility standards.

Within the Land Use Compatibility Table, Sub-district AEO1 does not allow any residential. Sub-district AEO2 restricts any residential except single family in the 65-70 Noise Zone where it is prohibited except with restrictions, and APZ 2 where it is permitted with restrictions. It is unclear how a land use can be prohibited and still have restrictions; this could be clarified by restating as

“prohibited, with exceptions.” Residential densities are not discussed except in reference to underlying zoning.

Following the land use and noise attenuation requirements are height restrictions, based on the Imaginary Surfaces as defined by Federal Aviation Regulations. These surfaces were modeled in a 3-D projection as part of the Joint Land Use Study and included in the previous section.

The AEO Zone Section 6.120 also enables the City to require avigation easements for the right to fly in the air space above property requesting a change in zoning, variance or special use permit.

City of Mascoutah

This ordinance is comparable to O'Fallon policy, but clarifies some land use compatibility issues and includes Runway Protection Zones or RPZs. Other similarities include the enabling of avigation easements for rezonings, variances and special use permit requests. The Federal Aviation Regulation Imaginary Surfaces are also defined for the aviation approach hazard areas.

Village of Shiloh

The Village of Shiloh Scott Airport Overlay Zone is based on the Scott Joint Use Environs and Site Plan as adopted by St. Clair County, which uses the 1991 AICUZ Noise Contours. The Airport Overlay Zone Ordinance includes all lands within the 65 L_{dn} Noise Zone of Scott AFB and MidAmerica St. Louis Airport

The Shiloh Land Use Compatibility table is based on Noise Contours; however, the Shiloh Table does not include Clear Zones and APZs.

Within the Land Use Compatibility Table, footnotes specify when noise attenuation is appropriate. The ordinance continues by restricting height compliance with the Illinois Department of Transportation Airport Hazard Zoning Plan for Scott Joint Use Airport Sections 77.10 through 77.140.

Other Locally Adopted Encroachment Tools

Lighting Standards

Encroachment issues can result from both poor land use decisions, as well as poor site design. Many outdoor lighting systems are often used to advertise a building's tenants without due consideration for light intrusion onto surrounding properties or into the night sky. A well crafted lighting ordinance, especially one that states a specific goal to reduce hindrance on military night vision training, is an effective tool for addressing "light pollution."

The Village of Shiloh has a complete lighting ordinance, most closely meeting the goal to reduce upward-directed light. O'Fallon's lighting ordinance was recently repealed, but the parking lot standards include specifics about lighting design to reduce spillage on surrounding properties. Neither Mascoutah nor St. Clair County has any specific lighting requirements, but a general statement in the Airport Overlay ordinance mentions reducing glare and confusing lighting signals for safe airplane maneuvering.

Avigation Easements

As mentioned above, avigation easements are enabled in the Airport Overlay for both Mascoutah and O'Fallon as part of approval for rezoning, variance, and special use permit requests. They are not enabled for building permits. The easements are not required in the code, and it is unclear how often they are made a condition of approval for these requests.

Flexible Development Patterns

One way to address encroachment, especially for property that straddles the 65 L_{dn} Noise Zone or Accident Potential Zone II, is to cluster development on property that is not within the affected area and leave the remainder of constrained land as open space or other compatible land uses.

Both St. Clair County and Shiloh have created a conservation ordinance, but neither can be effectively applied to noise or safety affected properties. St. Clair County's is applied to all lands within the 100-year floodplain or in stormwater retention basins. Shiloh has created a Conservation Overlay district in their Development Code tied to their comprehensive plan. The lands included for conservation are those in the floodplain, or characterized with steep slopes, wetlands and forests. Very few of these types of lands are located within noise or safety impacted lands.

The other two jurisdictions, O'Fallon and Mascoutah, have ordinances similar to Planned Use Developments. O'Fallon's Planned Uses ordinance states that the intent is to "increase the flexibility of development design through evaluation and approval of a site plan applying site-specific regulations" and allows the applicant to submit a narrative describing the needs for modification from the district regulations. Although not specified in the language of the ordinance, it could be inferred that reducing encroachment onto aviation noise and safety zones meets the intent of the ordinance. Explicitly stating this goal would reduce ambiguity.

The Mascoutah Planned Development Procedure, PDP, is structured like a typical Planned Unit Development. The PDP allows for a property owner to develop land in a method meeting the multiple goals of reducing encroachment, maximizing development potential and meeting the spirit and intent of Mascoutah's Comprehensive Plan and Unified Development Code.

Overview Of Comprehensive Plans

St Clair County Comprehensive Plan, 1991

The St. Clair County Comprehensive Plan was developed in 1991, before the Scott Air Force Base was a joint use facility but anticipates this conversion to joint use and especially its potential economic development impacts.

Within the Comprehensive Plan, much of the northeastern corner of St Clair County, including the area around the Scott Air Force Base is planned as a subarea known as the “Development Corridor.” This is an area of anticipated increased development due to the interstate corridor for I-64 and the introduction of commercial air service to the Scott Air Force Base. The area around Scott Air Force Base (and including the Air Force Base) in the County’s future land use plan is labeled the “Scott Joint Use Area.” The plan calls for a variety of commercial and industrial uses in this area, including light industrial, distribution, aircraft-related businesses, and corporate offices. The future land use plan shows large areas planned for industrial and commercial development around the perimeter of the Scott Joint Use Area.

Development restrictions in the vicinity of Scott Air Force Base, are not mentioned in the Comprehensive Plan.

In terms of future planning, the Comprehensive Plan suggests that a Special Development Overlay District should be developed to guide appropriate land use in the Scott Joint Use Area. Also, the Comprehensive Plan suggests that the county and proximate cities engage in an intergovernmental “development compact” in order to jointly manage land use, compatibility issues, and infrastructure issues in the Scott Joint Use Area.

A few infrastructure issues are also discussed in relation to Scott Air Force Base. The Comprehensive Plan suggests that land should be set aside for right-of-way for an “outer belt” roadway in the vicinity of Scott Air Force Base.

Village of Shiloh Comprehensive Plan, 2004

The Village of Shiloh Comprehensive Plan mentions the impacts of Scott Air Force Base and the MidAmerica Airport on future land use in its Development Limitations section. The airport impacts discussed in the plan include FAA regulations on maximum structure heights, accident potential zones, and noise zones. The Village has an Airport Noise Zone in its zoning code, which addresses land use regulations as well as noise insulation requirements. The Village’s Comprehensive Plan notes the particular impact of these airport zones on the southwest corner of I-64 and IL 158, which would otherwise be appropriate for intensive commercial development.

The Comprehensive Plan includes a map of the various height and hazard airport zones. The future land use map also displays the airport zones, and indicates that these areas are generally planned for either business or highway business land uses.

The Village of Shiloh acknowledges Scott Air Force Base and the MidAmerica Airport as valuable economic development assets. The preservation of the functionality of Scott Air Force Base and MidAmerica Airport and the prevention of land use conflicts in the vicinity of these airports are not explicit goals of the Comprehensive Plan.



New housing in the Village of Shiloh

City of O'Fallon Comprehensive Plan, 2006

Scott Air Force Base and the MidAmerica Airport are located to the south and east of the City of O'Fallon. The O'Fallon Comprehensive Plan incorporates the impacts of these airports in Chapter 4. This chapter reviews the impacts of Scott Air Force Base and MidAmerica Airport on adjoining land including accident potential zones, noise contour areas, and height limitations. The City developed an Airport Environs Overlay District in 1999 to regulate land uses in the vicinity of these airports. Also, the Comprehensive Plan includes a map of Airport Zones, which includes accident potential zones and noise contours. The Airport Zone map reflects a set of future land uses that are largely compatible with these airport zones.

There is a brief discussion of current land uses and their compatibility with the adjoining airports. The part of the City west of Scott-Troy Road within the airport zones is predominantly developed as single family, suggesting that there is already some incompatible development within the airport zones. East of Scott-Troy Road, land within the airport zones is undeveloped and unincorporated, where the City has a plan for a business and industrial park east of Scott-Troy Road. A master land use and roadway plan is illustrated for this area in the Comprehensive Plan under the name "MidAmerica Commerce Center Plan."



Housing in the City O'Fallon

Mascoutah Comprehensive Plan, 2007

The City of Mascoutah's Comprehensive Plan includes extensive discussion of Scott Air Force Base, MidAmerica Airport and their impacts on the future growth and development of the City. Much of the City's policy is guided by the 2001 AICUZ Study, which designated zones affected by noise and accident potential and provided guidance on appropriate development types within each zone.

Goal 2.4.4 of the Comprehensive Plan speaks of balancing development in the vicinity of Scott Air Force Base and MidAmerica Airport to protect the interests of the base and airport, while promoting the economic development needs of the community. This overall land use goal is then supported by a number of sub-goals and policies that promote advanced planning and collaboration between the City and the Scott Air Force Base on land use review.

The land use portion of the Comprehensive Plan provides detailed guidance on appropriate land use in and around Scott Air Force Base and MidAmerica Airport. There is a land use classification for MidAmerica Airport-related uses and a land use classification for areas affected by Scott Air Force Base. There are also two overlay districts, an Airport Overlay District which is governed by noise contours and adheres to FAA guidelines for land use compatibility, and an APZ Overlay District that conforms to the accident potential zones as determined by the 2001 AICUZ study. Any proposed land use change in the APZ Overlay District must be reviewed and commented on by Scott Air Force Base personnel before approval. In general, the City of Mascoutah seeks to discourage residential development in proximity to the Scott Air Force Base and instead seeks to promote business and industrial land uses in this area.

The Comprehensive Plan also anticipates the current JLUS study. The City of Mascoutah Comprehensive Plan looks to the JLUS as an opportunity to continue its policy of joint planning

for airport-community impacts and seeks further clarification on appropriate land uses as designated by the AICUZ guidelines. Scott Air Force Base and MidAmerica Airport are also both included in the review of current infrastructure and future infrastructure needs. A proposed North County Road improvement is discussed as being important in improving the flow of traffic to Scott Air Force Base. The City provides water and sewer service to MidAmerica Airport and houses a 500,000 gallon water storage tower at the airport. The City of Mascoutah, Scott Air Force Base, and MidAmerica Airport are highly linked by a common infrastructure and this further emphasizes their need for joint planning and coordination.

In terms of economic development, the City of Mascoutah is seeking to expand its commercial and industrial development to increase its tax base (Goal 5.3.1). This is relevant because one of the mechanisms the City would like to use is an expansion of St. Clair County's MidAmerica Enterprise Zone, which could be expanded in areas planned for business or industrial development near the airport.



Housing in the City of Mascoutah

Summary Table of Local Jurisdiction Tools

Encroachment Tool	City of Mascoutah	City of O'Fallon	Village of Shiloh	St. Clair County
Airport Overlay	Airport Overlay District (AO)	Airport Environs Overlay (AEO) District	Scott Airport Overlay Zone	Scott Airport Overlay Zone (O-3)
<i>Requires coordination or consultation with either the Base or the Airport for all zonings, subdivisions, or building permits when within close proximity</i>	Not specifically, but the City has adopted a policy to have all land use requests within the APZ submitted to Scott AFB, the Airport and St. Clair County	No	Yes, per Sec.6.4.07.09, applicant for building or zoning permit must obtain Scott AFB concurrence	No
<i>Tied to most recent Noise Contours</i>	Yes, specifies current runways, and allows for updates. Sec. 34-6-5	Yes, allows for updates, Sec. 6.040	No, tied to Scott Joint Use Environs and Site Plan currently adopted by St. Clair, which is the 1991 plan. Sec. 6.4.07.01	No, tied to 1991 AICUZ, sec. 40-4-103
<i>Includes lands within the 65 Ldn and greater Noise Contours</i>	Yes, and APZs and CZs for current runways, and height hazard areas, Sec. 34-6-5	Yes, Sec. 6.040	Yes, sec. 6.4.07.01	Yes, sec. 40-4-103
<i>Provides definition of incompatible land uses</i>	Defines need to protect 'noise sensitive uses'. Also general definition as uses that could adversely affect airport operation or safety in Sec. 34-6-4	Guidance in Sec. 6.050	General definition as uses that could adversely affect airport operation or safety in sec. 6.4.07.02	General definition as uses that could adversely affect airport operation or safety in sec. 40-4-104

Summary Table Of Local Jurisdiction Tools, *continued*

Encroachment Tool	City of Mascoutah	City of O'Fallon	Village of Shiloh	St. Clair County
Airport Overlay, <i>continued</i>	Airport Overlay District (AO)	Airport Environs Overlay (AEO) District	Scott Airport Overlay Zone	Scott Airport Overlay Zone (O-3)
<i>Lists permitted and prohibited uses</i>	Yes, prohibited uses in 34-6-8	Yes, Sec. 6.060	Yes, Land Use Compatibility Table in sec. 6.4.07.03	Yes, but located in multiple sections
<i>Differentiates between Civil and Military Airport</i>	Yes, uses RPZ on Land Use Compatibility Table, Table 6-1	No, uses Military APZs and CZ on Civilian airport.	No, makes no mention of APZs, CZs, or RPZs.	No, makes no mention of APZ, CZs, or RPZs.
<i>Differentiates between noise and safety impact areas</i>	Yes, in Land Use Compatibility Table	Yes, in Land Use Tables	No	No
<i>Discusses residential density</i>	Although not specifically listed in the prohibited uses, residential is not included on the Land Use Compatibility Table 6-1. Sec. 34 6-7 states that Tables 6-1 and 6-2 establish permitted uses. Table 6-2 does not address density other than differentiating between single family and multi-family residential.	No. But sub-district AEO1 does not allow any residential. Sub-district AEO2 restricts any residential except single family in 65-70 Noise Zone where it is prohibited except with restrictions, and APZ 2 where it is permitted with restrictions. Sec. 6.060	No. But residential is prohibited in Ldn 75 and greater, and permitted only with noise attenuation in Ldn 65-75. Sec. 6.4.07.03	Yes, permits agricultural density of 1 du per 40 acres, but then Noise Compatibility Guide states that all residential is incompatible. Sec.40-4-105 and 40-4-116

Summary Table of Local Jurisdiction Tools, *continued*

Encroachment Tool	City of Mascoutah	City of O'Fallon	Village of Shiloh	St. Clair County
Noise Attenuation				
<i>Provides general noise attenuation requirements in airport impact areas</i>	Yes, with noise leak reduction through ventilation systems, doors and windows. Sec. 34-6-7	Yes, Sec.6.060.B and Land Use Tables	Yes, 6.4.07.05 and Land Use Tables	Yes, with some explanation of reducing noise leaks through ventilation systems, doors, and windows. Sec. 40-4-114
<i>Provides specific noise attenuation standards based on location within impact areas</i>	Yes, Noise Level Reduction of 25 or 30 dB in Sec. 34-6-7	Yes, Noise Level Reduction of 25 or 30 dB in Sec. 6.060.B and Land Use Tables.	Yes, section 6.4.07.05 adds additional requirement of STC 25 between mixed uses and Sec. 6.4.07.06 lists similar noise leak reduction as St. Clair County ordinance	No specific reduction required other than reducing noise leaks in sec. 40-4-114
<i>Which Building Code standards, if any, are used for noise attenuation?</i>	ICC 2003- no specific codes for indoor noise attenuation	ICC 2003- no specific codes for indoor noise attenuation	ICC 2003- no specific codes for indoor noise attenuation	ICC 2003- no specific codes for indoor noise attenuation
Electromagnetic or Radio Frequency Interference				
<i>Specifically prohibits interference with airport electromagnetic and radio frequency communications links</i>	Yes, Sec. 34-6-6	Yes, Sec. 6.050	Yes, Sec. 6.4.07.04	Yes, Sec. 40-4-110

Summary Table of Local Jurisdiction Tools, *continued*

Encroachment Tool	City of Mascoutah	City of O'Fallon	Village of Shiloh	St. Clair County
Height Standards				
<i>Other than FAA requirements, additional requirements related to airports</i>	Yes, must not exceed airport approach area height limits. Sec. 34-3-1. Specific reference to Federal Aviation Regulations Imaginary Surfaces Sec. 34-6-9	Within AEO District, height restrictions specific to Federal Aviation Regulations Imaginary Surfaces Sec. 6.070	Specifically requires Illinois Department of Transportation Airport Hazard Zoning Plan for Scott Joint Use Airport IDOT Sections 77.10 through 77.140 in sec. 6.4.07.08	Height and Hazard regulations for Scott AFB and Civilian Airport mentioned in Sec. 40-1-18, but no specifics given in O-3 ordinance.
Bird Strike Hazards				
<i>Specifically addresses bird strike hazards</i>	No	No	Yes, Sec. 6.4.07.04	Yes, Sec. 40-4-110
Lighting Standards				
<i>Light spillage addressed</i>	No	Yes, within parking lots. Sec. 11.090	Yes, onto residential lots only. Sec.6.3.16 6.4.09.08	None found
<i>Specific Light Ordinance</i>	None found	Repealed in either 2007 or 2006.	Yes, and restricts light directed upward or not on a building or walkway. Sec. 6.7.22	None found
<i>Specific lighting standards related to safety for airplan maneuvering</i>	Yes, Sec. 34-6-6	Yes, Sec.6.050	Yes, Sec. 6.04.07.04	Yes, Sec. 40-4-110
<i>Specific lighting standards related to night vision and military training</i>	No	No	No	No

Summary Table of Local Jurisdiction Tools, continued

Encroachment Tool	City of Mascoutah	City of O'Fallon	Village of Shiloh	St. Clair County
Avigation Easements				
<i>Easements required as condition of approval of request</i>	Enabled only, but not required. For rezoning, variance, or special use permit. Sec. 34-6-14	Enabled only, not required. For rezoning, variance, or special use permit. Sec. 6.120	No	No
Noise Easements				
<i>Easements required as condition of approval of request</i>	No	No	No	No
Flexible Development Patterns				
<i>Creates or has available a conservation subdivision ordinance</i>	None found	None found	Yes, based on Comprehensive Plan Sec. 6.4.07.11	Yes, but only for lands within the 100 yr flood plain and stormwater retention basins Sec. 40-4-90
<i>Creates or has available flexible development regulations, such as a Planned Unit Development, to allow clustered development</i>	Yes, PDP Planned Development Procedure. Sec. 34-6-30	Planned Uses, but does not appear to allow clustering. Sec. 9.010	Yes, PUD Sec. 6.11.01	None found
Disclosure				
<i>Requires property owners to disclose location within Noise Contours, APZs, or Clear Zones to potential buyers or renters</i>	No	No	No	No

Summary Table of Local Jurisdiction Tools, *continued*

Encroachment Tool	City of Mascoutah	City of O'Fallon	Village of Shiloh	St. Clair County
Comprehensive Plan				
<i>Comprehensive Plan updated on a regular basis either by adopted policy or practice</i>	No	No	No	No. The Comprehensive Plan Update is underway.
<i>Plan includes language supporting compatible land use planning surrounding Scott AFB and MidAmerica St. Louis Airport</i>	Yes	Yes	Not explicitly, but it does acknowledge both the Base and the Airport as important economic engines for the Village	Yes.
<i>Future Land Use Plan reflects desire for compatible land uses surrounding the Base and the Airport</i>	Yes	In most cases	In most cases except along Il-158 and Maple Street	No future land use plan adopted
<i>Plan is specifically tied to the Capital Improvement Plan or to individual capital improvement projects</i>	Unknown, not mentioned in Comprehensive Plan.	Unknown, not mentioned in Comprehensive Plan.	Unknown, not mentioned in Comprehensive Plan.	Unknown, not mentioned in Comprehensive Plan.
<i>Capital Improvement Plan and/or individual infrastructure improvements are developed to support compatible land uses surrounding Scott AFB and MidAmerica St. Louis Airport</i>	Current Comprehensive Plan discusses the importance of linking capital improvements to promote desired development	Unknown	Unknown	Unknown

Summary Table of Local Jurisdiction Tools, *continued*

Encroachment Tool	City of Mascoutah	City of O'Fallon	Village of Shiloh	St. Clair County
Local Coordination Agreements				
<i>Local jurisdictions have signed agreements with each other pertaining to future annexations and potential land uses/ densities on those properties</i>	No	No	No	No
<i>Local jurisdictions have signed a Memorandum of Understanding with each other, Scott AFB and MidAmerica St. Louis Airport concerning communication procedures</i>	No	No	No	No
Education and Outreach				
<i>Local Jurisdiction has an outreach program about Base and/ or Airport impacts on surrounding properties</i>	No	No	No	No
Implementation and Enforcement				
<i>Local Jurisdiction has an implementation and/ or enforcement body that regularly addresses encroachment and compatible land use decisions</i>	No	No	No	No

Analysis of Current Land Use Compatibility

This section reviews current land uses to identify existing incompatibilities and to develop indicators of future land use conflicts. The following sections review current land uses within the Scott AFB runway Accident Potential Zones (APZ), Clear Zones, and Noise Contours as well as the MidAmerica St. Louis Airport Runway Protection Zones (RPZ) and Noise Contours. Some communities in the region use military APZ on the civilian runway. For purposes of the JLUS analysis, APZ compatibility will only be reviewed for the military runway.

APZs, Clear Zones and RPZs

Figure 9, *Existing Land Use*, shows the current built conditions around the base and Airport. Northwest of Scott AFB, within the northern Clear Zone, the majority of the land is either within Scott

AFB boundaries, or classified as vacant farmland by the St. Clair GIS dataset. Both the City of O'Fallon's and The Village of Shiloh's municipal boundaries converge within APZ 1; however, a vast majority of this land is owned by St. Clair County purchased with FAA funds. Property on the northwest corner of the intersection of IL 158 and Maple Street, which lies within the APZ 1, is classified as residential and farm.

Land within APZ 2, which reaches into the centers of O'Fallon and Shiloh, are much more developed. Property southeast of Main Street is largely used for farming and classified as vacant farms. A portion of Valley View Farms Mobile Home Park, south east of Main Street, is located within APZ 2. A recent expansion of this park was denied by the Village of Shiloh based on its location within the Accident Potential Zone. Some large lot residential properties exist along Main Street adjacent to Interstate 64.

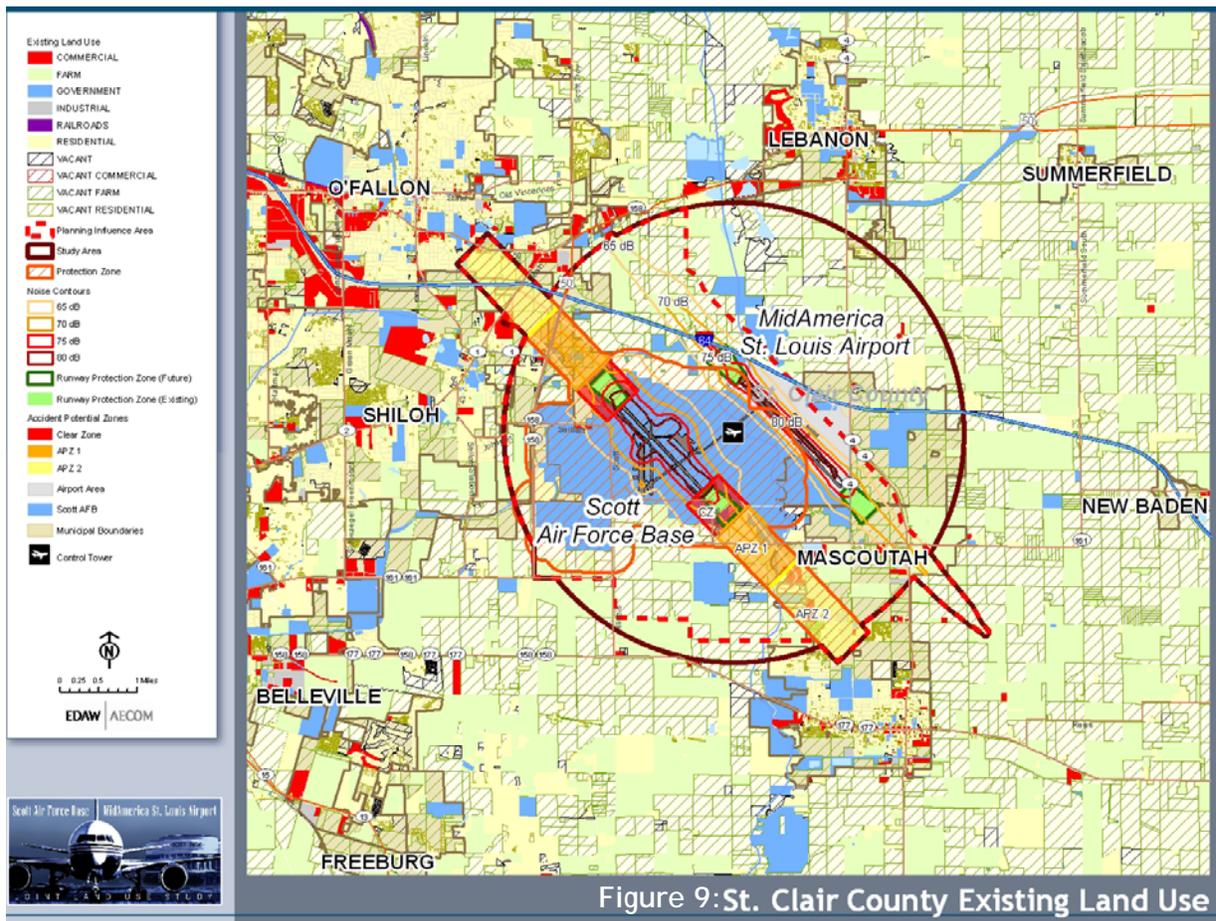


Figure 9: St. Clair County Existing Land Use

North of I-64 are the established residential developments of Timber Creek Estates, The Manor at Timber Creek, and Oak Tree Estates, all within the APZ 2. According to the O'Fallon Comprehensive Plan, these developments existed before the 1991 AICUZ study performed for Scott AFB. When the Scott AFB runway was extended another 2,000 feet, the APZs were also extended, therefore including these properties. Also in this area is Laverna Evans Elementary school, which is split along APZ 2 with the structure outside of the APZ and the ballfields within the APZ. At the time the school was built, the property was not within the APZ.

In the most northern tip of APZ 2, at the intersection of South Seven Hills Road and Highway 50 are two places of worship including Crossview Independent Assembly and the campus of First Baptist Church of O'Fallon. Although the property owned by these entities split the APZ, both congregation halls are within the APZ. Other commercial land uses along Highway 50 in the APZ include a bank, a small commercial center, and a horse farm. The remaining land is categorized as farm or vacant.

In the southern portion of the Scott AFB Clear Zones and APZ, all of the land within the Clear Zone is either within the Scott fence line or owned by St. Clair County for the Airport. Within APZ 1, all the land north of IL 161 is also owned by the County. South of IL 161 lies a large farm, the bottomlands of Silver Creek and the Caseyville Gun Club. At the time of this study, St. Clair County is in negotiation with the Gun Club to purchase their property.

Along North County Road, within the APZ 2, the majority of land use is farming. A parcel along the west side of North County Road is designated as government or another tax exempt user, and a parcel along the east side is classified as commercial for GTE Phone Operations. South of West Feusser Road, several small-lot subdivisions

have been developed within the APZ 2, including Greystone Manor, Quail Point, Hunters Creek, Windshire, and North Towne.

Another residential development is under construction on the south side of West Feusser Road, west of North 6th Street, on property that was once a large farm. At the intersection of West Feusser Road and North 6th Street, a small church, commercial building and daycare lie within the Accident Potential Zone 2.

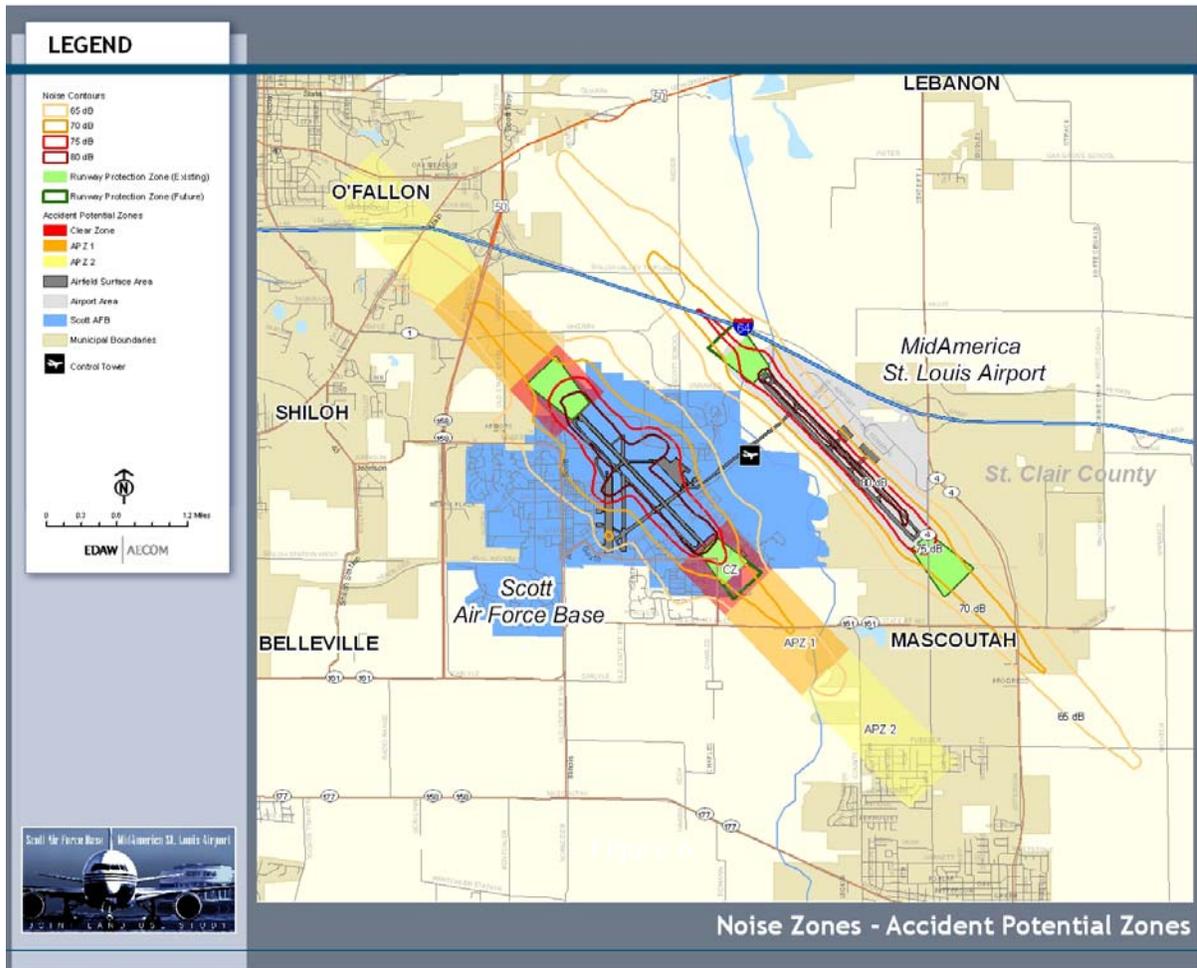
All of the property within the MidAmerica St. Louis Airport Runway Protection Zones (RPZs) is owned by the County for the Airport use.

Noise Contours

Figure 6, *Noise Zones – Accident Potential Zones*, shows the noise contours associated with Scott AFB and the Airport. Flights using the Air Force runway and the civilian runway produce noise, which is then measured in decibels and categorized into Noise Contours. These contours extend beyond the boundaries of both the Air Force Base and the Airport into the surrounding communities.

Almost all of the land within the 75 dB Noise Contour for the runway is within installation boundaries; and if it is outside of the boundaries, the land is owned by the County for the Airport. Almost all of the land within the 70 dB Noise Contour for the Scott runway is owned by the County for the Airport. The southernmost tip of the contour laps onto a private farm just south of IL 161.

While the majority of land within the 65 dB Noise Contour is also within the purview of Scott AFB or the County-owned Airport lands, a significant portion does fall on private landowners. Just south of I-64, west of IL 158 and east of Main Street, property that is currently categorized as vacant farm is within the Noise Contour. This property is also within the Accident Potential Zone 2 as described above. South of the Scott runway, the 65



dB Noise Contour extends south of IL 161 onto a private farm, the bottomlands of Silver Creek and the Caseyville Gun Club.

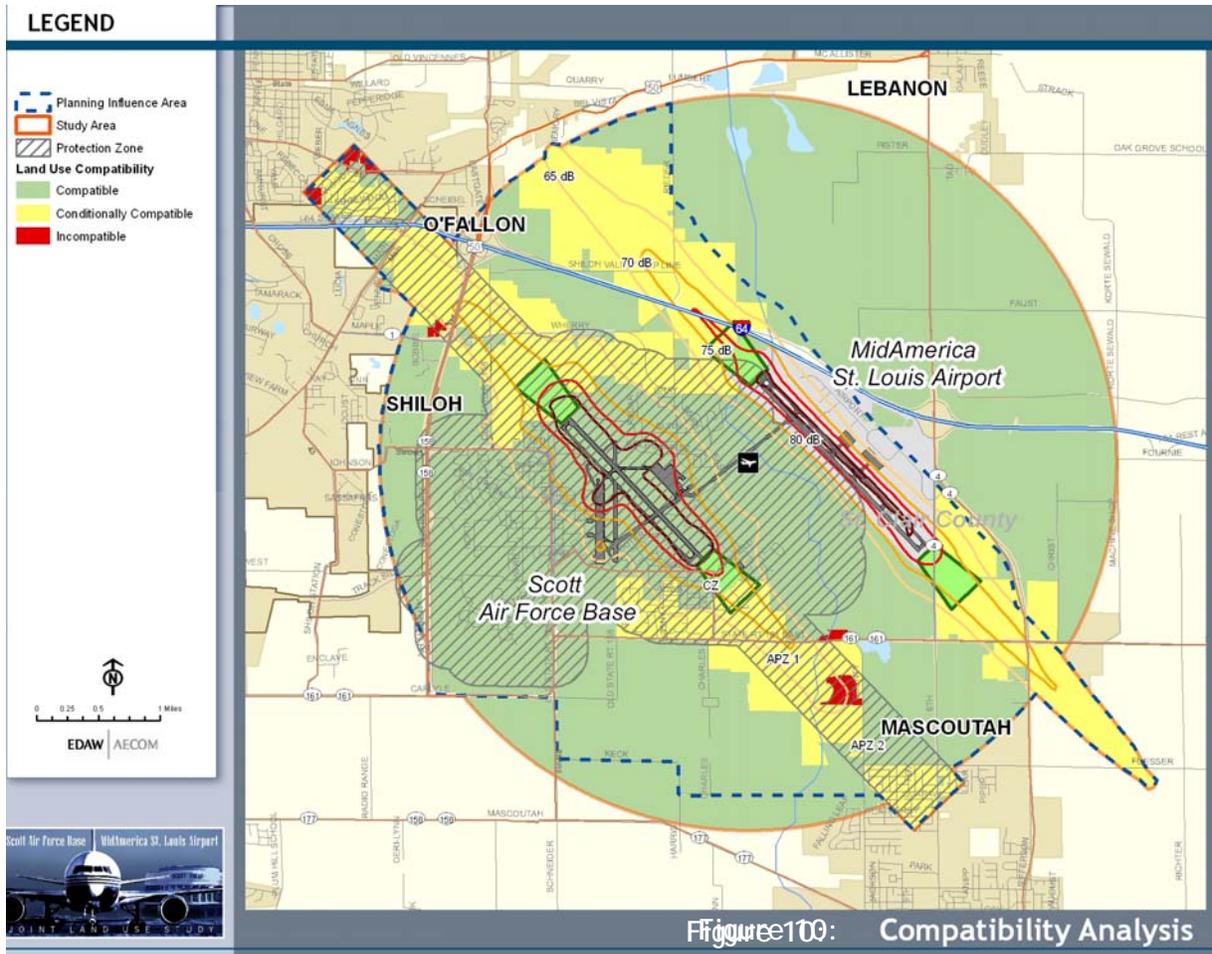
Only a few parcels within the Valley View Farms Mobile Home Park are in the 65 dB Noise Contour but are not within the Accident Potential Zones.

All of the land within the MidAmerica St. Louis Airport 75 dB Noise Contour is owned by the County. A few properties in the southern point of the 70 dB Noise Contour are owned by private individuals and classified as vacant farmland. A small portion of the northern tip of the 70 dB Noise Contour extends onto private property north of I-64 and west of South Rieder Road that is classified as active farmland.

A vast majority of the property in the 65 dB Noise Contour is in private ownership and is classified as either active or vacant farm land.

Summary of Existing Land Use Areas of Concern

Figure 10, *Compatibility Analysis*, shows the results of the existing land use compatibility analysis. Based upon the Guidelines for Considering Noise in Land Use Planning and Control (FICUN, 1980) and the DoD Compatible Land Use Guidelines for Clear Zones and Accident Potential Zones (US Army, 1981), parcels have been coded green (compatible), yellow (conditionally compatible), and red (incompatible). In cases in which a parcel was found to be only partially within the boundaries of a noise contour or APZ, the parcel was coded as though it were entirely within the boundary.



Conditionally compatible refers to a land use that is compatible with special protections as identified in the guidelines. Most of the parcels within the noise contours and APZs at Scott Air Force Base are either compatible or conditionally compatible. However, there are a few parcels that are considered incompatible under the guidelines. Some areas of specific concern are:

- The Valley View Farms Mobile Home Park in the Scott APZ 2 and 65 dB Noise Contour;
- The established neighborhoods south of Highway 50 and north of I-64 in the APZ 2;
- Laverna Evans Elementary school; and
- The cluster of church campuses at the intersection of Highway 50 and South Seven Hills Road.

- The existing and developing neighborhoods along West Feusser Road and North County Road in the southern Scott APZ 2;
- The Caseyville Gun Club in the Scott APZ 2 and 65 dB Noise Contour;
- Spring Valley Baptist Church at the intersection of IL-158 and Maple Road (a small corner of the property is in the northern Scott APZ 1);

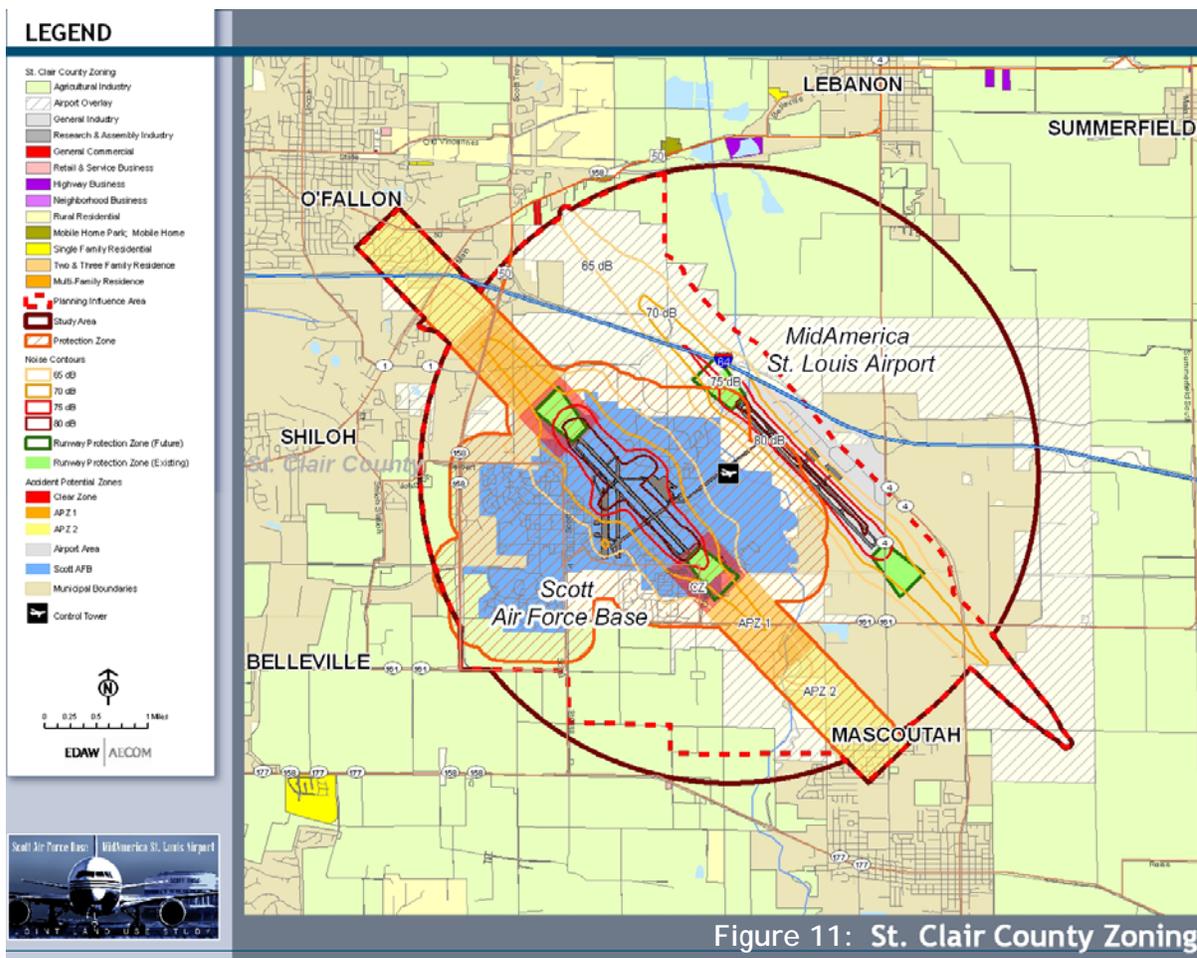
Table 15: Compatibility Analysis Summary of Acreage

Category	Total Acreage
Compatible	16,379
Conditionally Compatible	4,886
Incompatible	97

Analysis of Zoning Compatibility

St. Clair County

Overall, all of the land that is located in the APZs, Clear Zones, RPZs, or Noise Contours and is within the purview of St. Clair County is zoned Airport Overlay (O-3). The County requires some level of land use compatibility within the Airport Overlay, as described above in the Zoning Code analysis section. See Figure 11- *St. Clair County Zoning*.



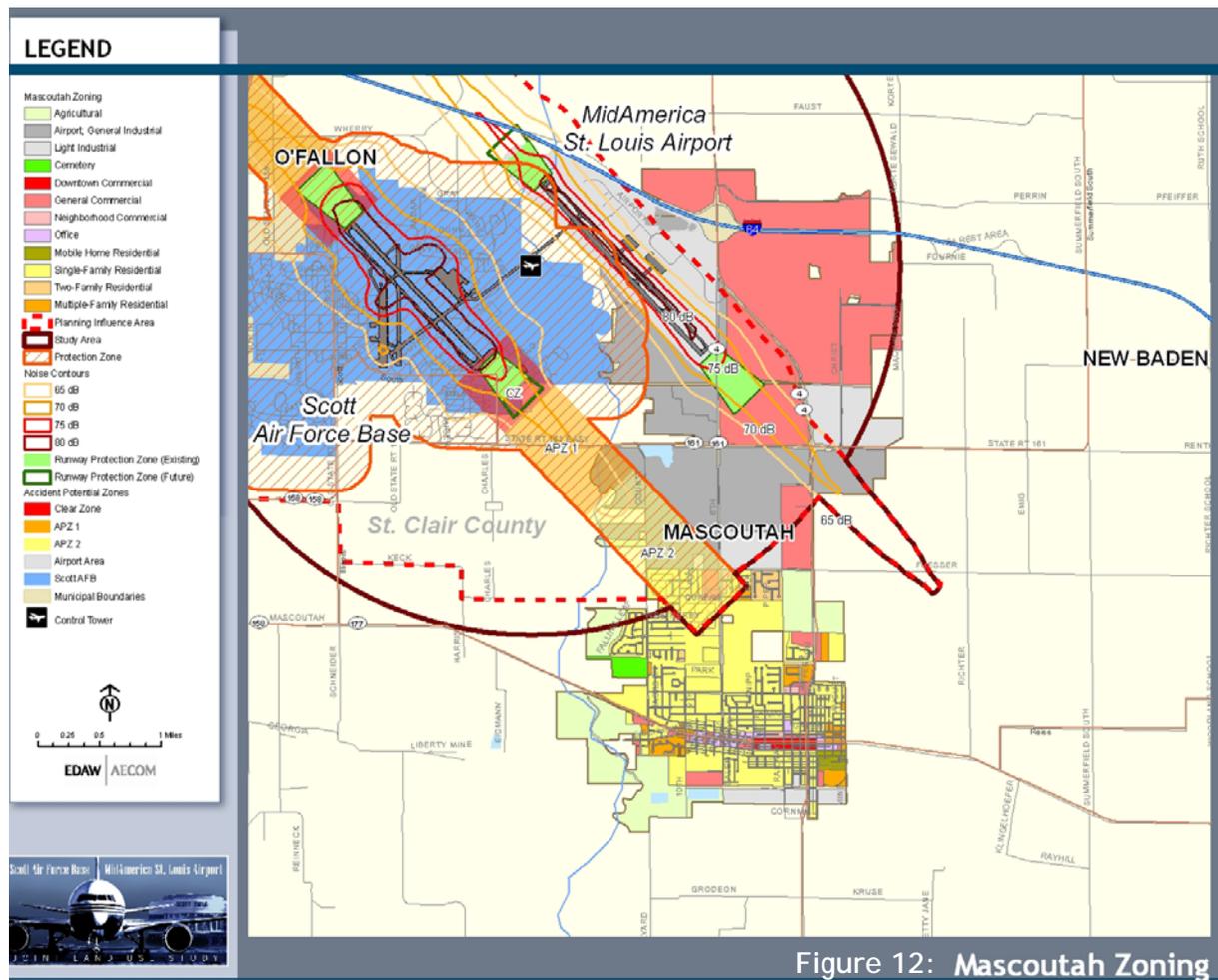
Mascoutah

All properties within the Noise Contours and APZs are within the Airport Overlay Zone and therefore have some level of compatibility requirements. Properties within the MidAmerica St Louis Airport Noise Contours are zoned as either “Airport”, “General Industrial”, “Light Industrial”, or “General Commercial.”

Properties within the Scott AFB runway Noise Contours are zoned “General Industrial.” See Figure 12- *Mascoutah Zoning*.

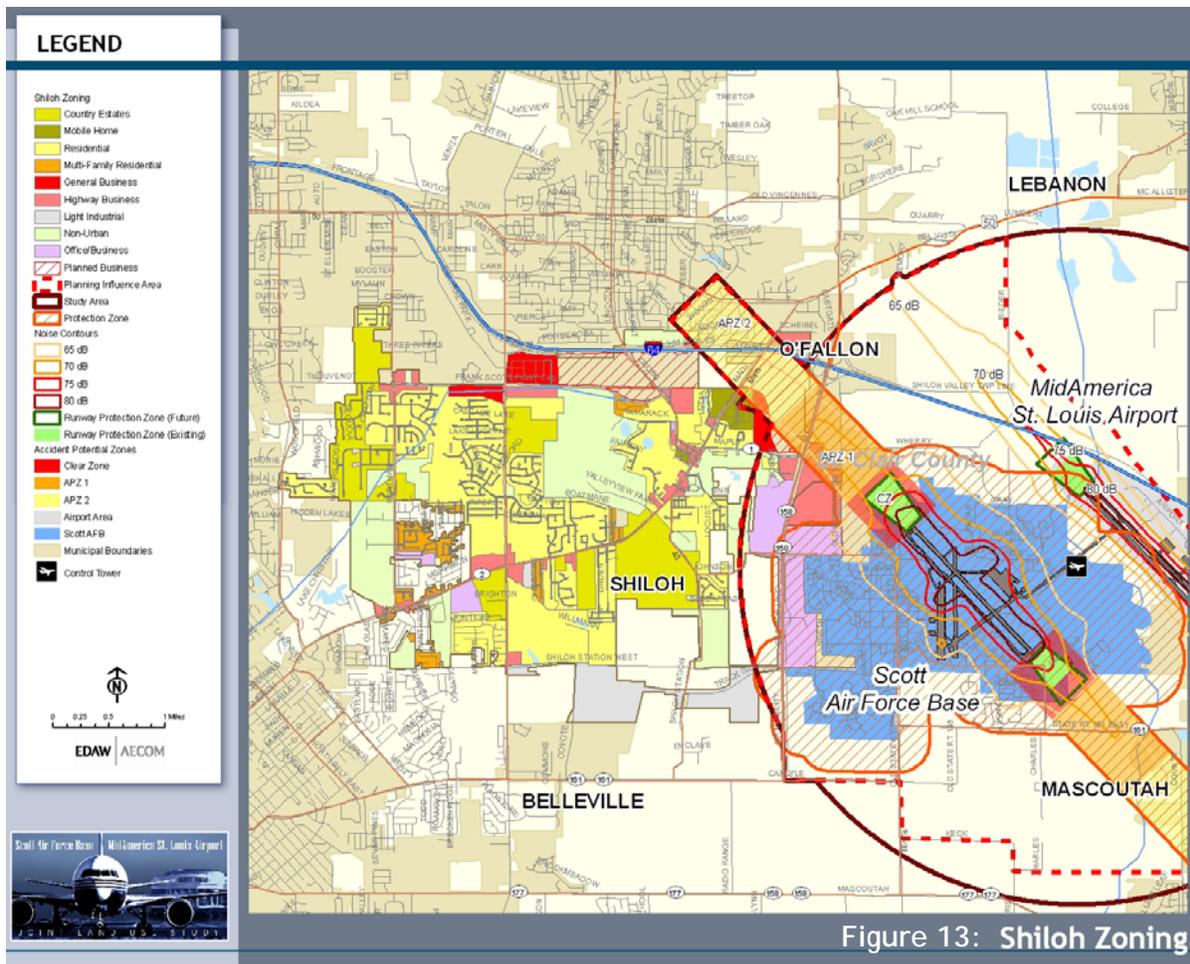
Properties within the Scott AFB APZ 1 are zoned “General Industrial”, but lands within the APZ 2 are much more varied. Zoning includes Agricultural, Single Family Residential (RS-10), General Commercial, Neighborhood Commercial and a section of Multi-Family Residential in the southern most section of the APZ. The Single-Family

Residential Zone (RS-10) requires a minimum lot size of 10,000 square feet; the Multi-Family Residential (RM) property is developed with duplexes on a minimum of 6,000 square foot lots. The General Commercial zone allows for more intense commercial development than the Neighborhood Commercial zone, while the General Industrial zone allows for more intense industrial development than the Light Industrial zone.



Village of Shiloh

All land within the Noise Contours are also within the Scott Airport Overlay Zone; but this does not include properties that are within the Accident Potential Zones. Zoning for properties within an APZ include “B-4 General Business District,” “B-3 Office Business District,” “PB Planned Business District,” and a wedge of “MH Mobile Home Park.” The B-3 district is for businesses serving the community and surrounding area, while the B-4 district is intended to accommodate a wide range of more intense and larger scale retail, service, office and other uses meant to serve both the community and the larger region. The PB District allows for maximum flexibility in developing and designing a commercial site, and the MH district sets Mobile Home Park standards. See Figure 13 - *Shiloh Zoning*.



O'Fallon

All properties within the 1991 Noise Contours are within the “O-3 Airport Overlay” Zoning District. This also includes an APZ over the civilian airport. Because of the Airport Overlay District, some level of land use compatibility is required, as described in the Zoning Code Analysis section above.

Property adjacent to Scott AFB south of I-64 is zoned “B-1 Community Business District” and “A Agricultural.” Most of this property is undeveloped as zoned. Properties within APZ 2 north of I-64 are zoned “SR-2 Single Family Residential” “SR-1 Single Family Residential” and “B-1 Community Business District.” Most of the properties north of I-64 are developed; however, a large agricultural tract may convert to a higher use in the future. See Figure 14 - *O'Fallon Zoning*.

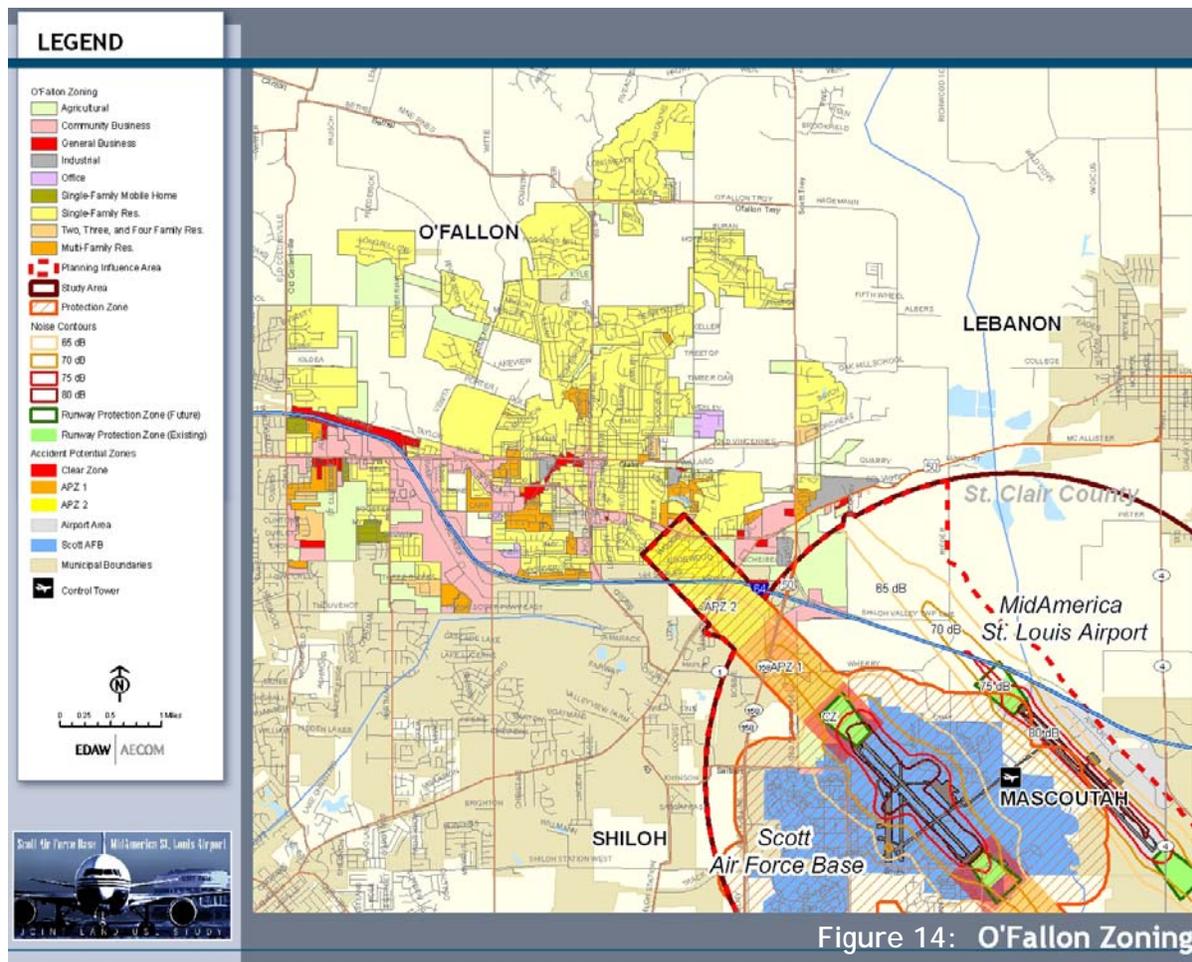


Figure 14: O'Fallon Zoning

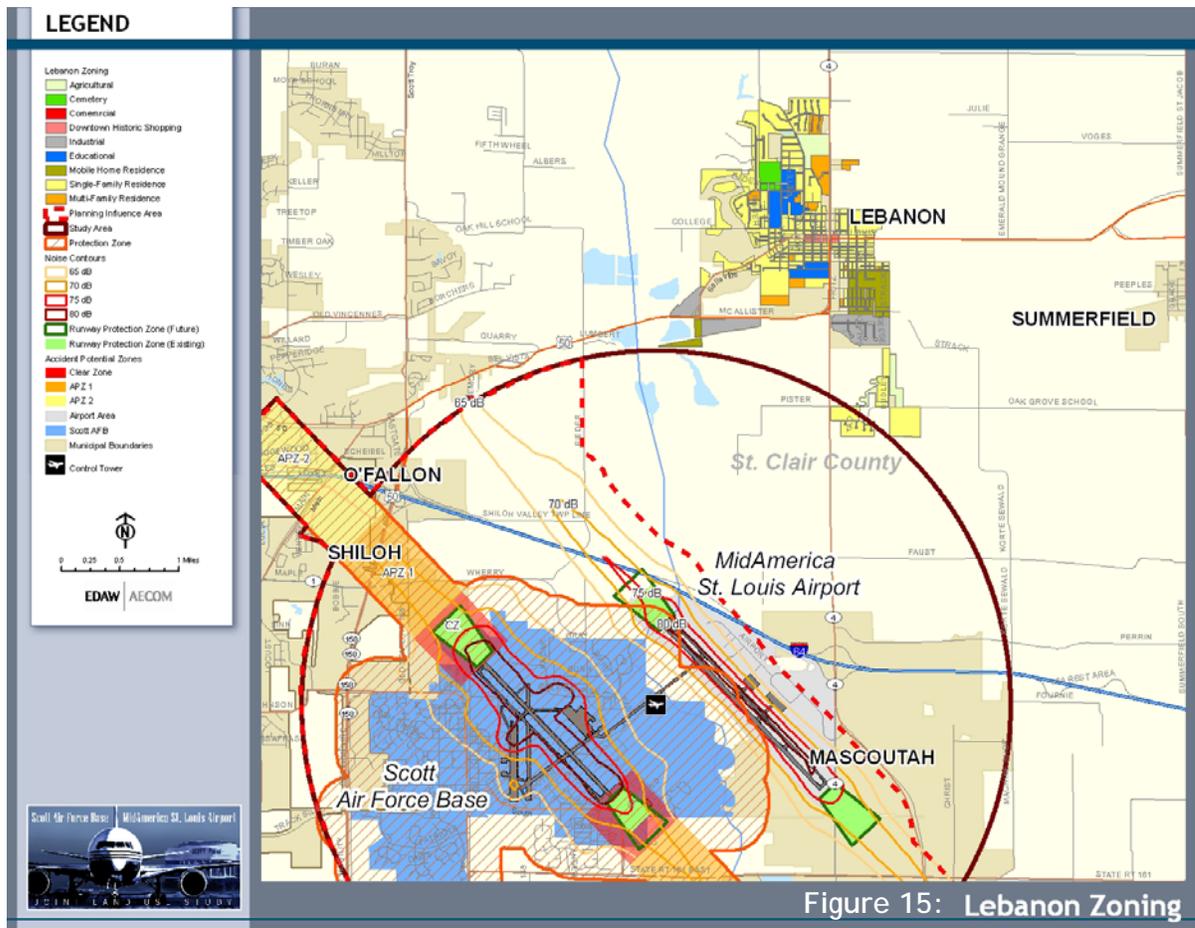
Lebanon

Since no land within the Lebanon municipal boundaries is within the Noise Contours or APZs, there is no pressing zoning concern for the City. See Figure 15 - *Lebanon Zoning*.

Existing Zoning Areas of Concern

Although most zoning in the impacted areas reflects current use, some undeveloped properties are zoned for higher intensity development. Most of these areas are affected by a protective overlay, and therefore subject to some level of land use compatibility:

- A large portion of land in Mascoutah within the APZs and Noise Contours is undeveloped but zoned for commercial and industrial uses.
- The PB zoned property along the western side of IL-158 and the B-3 zoned property along the eastern side of IL-158 within the APZ 2 allow for commercial development which may have an impact on Scott AFB.
- The B-4 zoned property along Maple Street is partially located in APZ 2 and allows for regional commercial development that could have an impact on Scott AFB.
- The undeveloped O'Fallon land zoned B-1 in close proximity to Scott AFB along IL-158.



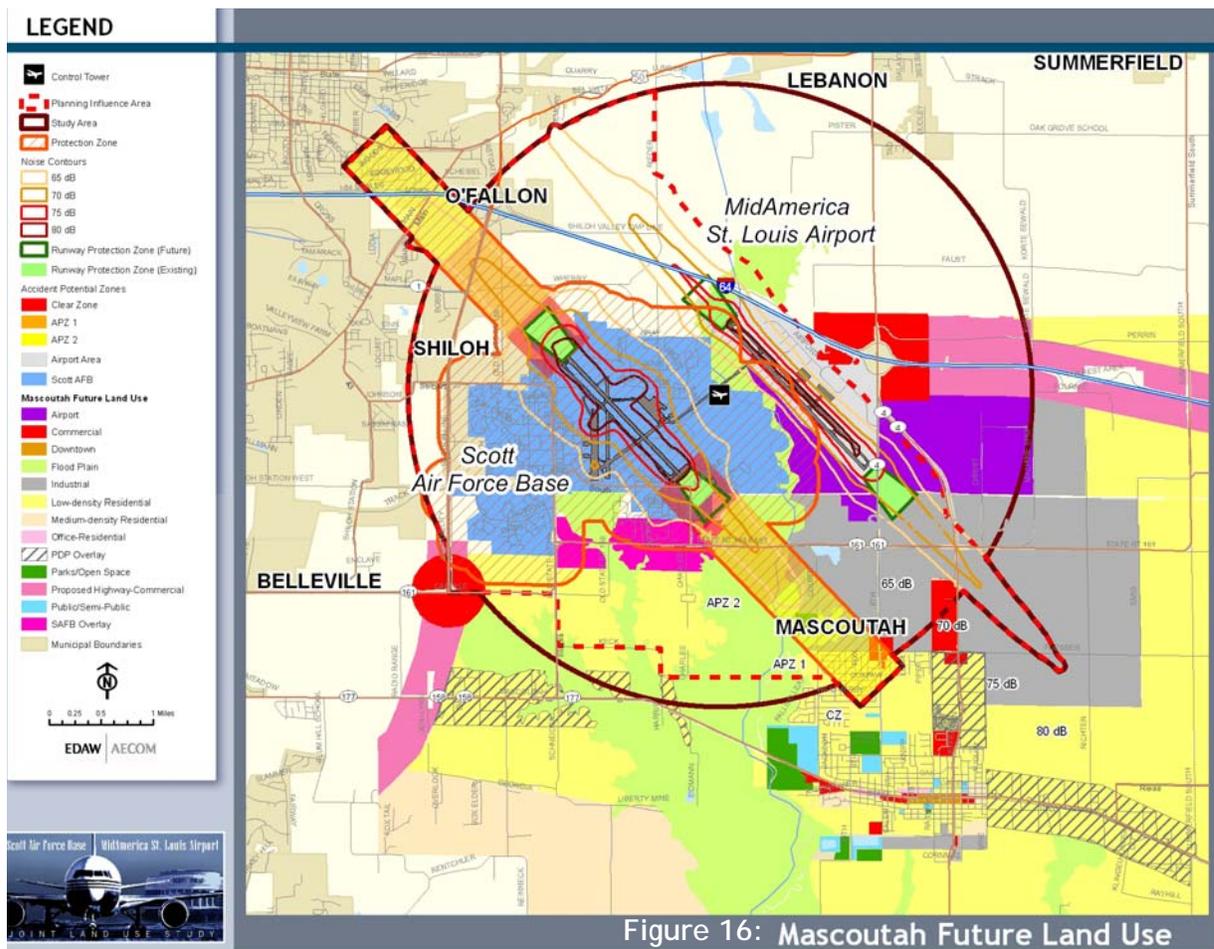
Analysis of Future Land Use Compatibility

The purpose of this section is to identify foreseeable land use conflicts around Scott AFB and MidAmerica St. Louis Airport based on future land use plans, recent development activity and a build out analysis. The intent is to ensure that the planning boundaries as established for this JLUS encompass lands with significant growth pressure in proximity to the airfields. Figure 19 - *Regional Future Land Use* combines all of the available future land use plans into one map for a comprehensive view of the region at the end of this section.

City of Mascoutah

Figure 16 - *Mascoutah Future Land Use* depicts the city's recently adopted plan. Areas that may pose a concern in the future are:

- Land along IL-161 south of Scott AFB within the Clear Zone and APZ 1 are planned for Scott AFB Related Use. In the Comprehensive Plan, this is defined as land where the base may expand and include supportive services such as base housing, day care and commercial services.
- Land designated for industrial use south of IL-161 along Lake Road and north of Fuesser Road within the APZ 1 and 2.
- Commercially designated land along Feusser Road is within APZ 2.
- Low Density Residential property south of Feusser Road within APZ 2 is defined in the Comprehensive Plan as allowing up to 5 dwelling units per acre. Also permitted within this designation are schools and places of worship.

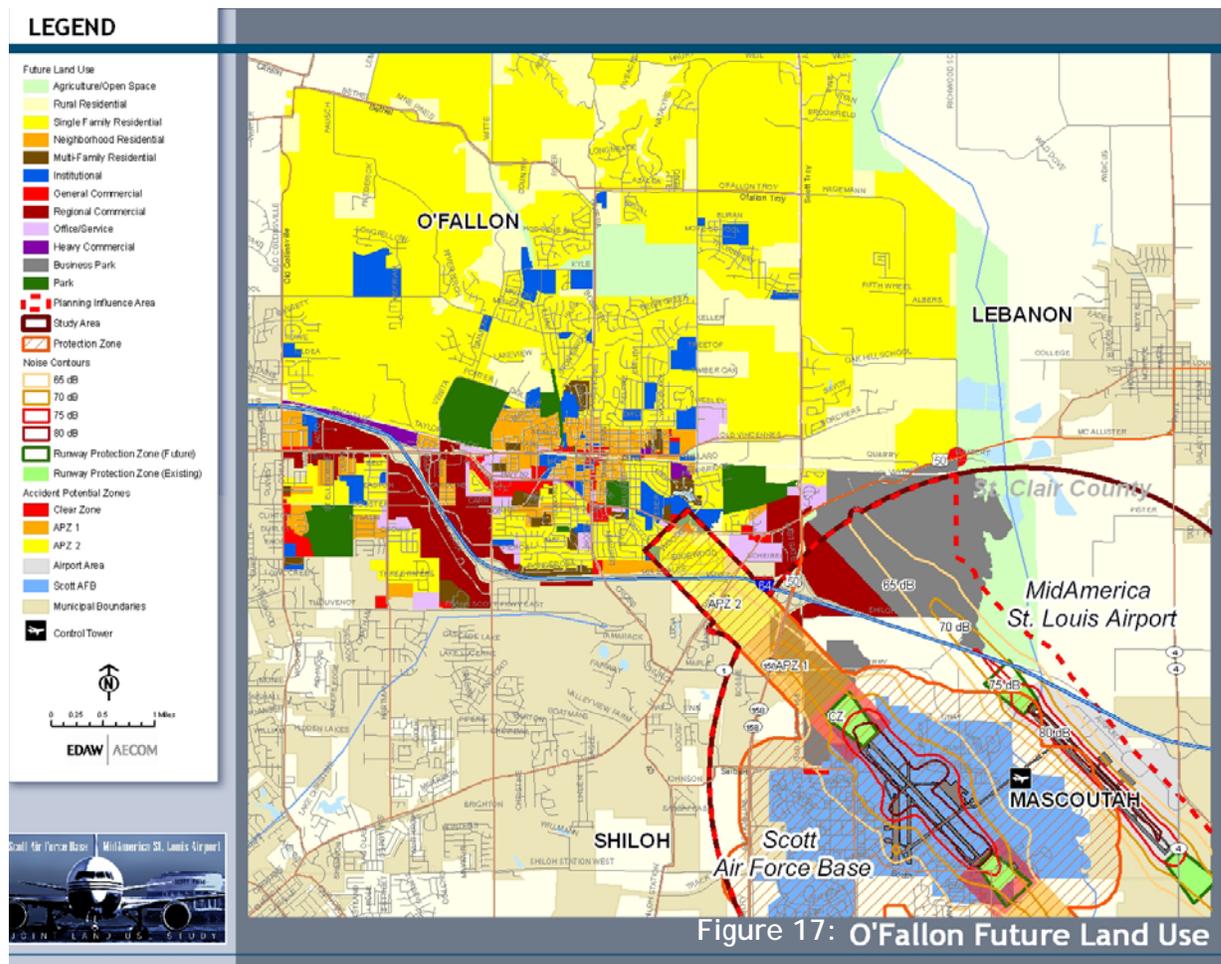


City of O'Fallon

Figure 17- *O'Fallon Future Land Use* shows the City's long term plan. Most of the land north of I-64 and west of IL-158 is already developed and the future plans call for those lands to remain in the same use category. Some undeveloped parcels on the south side of Highway 50 are recommended for office/service, which is defined as either office or light retail uses with a recommended Floor to Area Ratio (FAR) of 0.25 to 0.33. Property on the east of IL-158 and south of Highway 50 is part of the MidAmerica Commerce Center sub-area plan which calls for the development of a business and warehouse park with some regional-scale retail. The land use plan for the MidAmerica Commerce Center demonstrates the City's use of military APZ designations on the civilian airport.

Generally, the Comprehensive Plan defines Business Industrial Park for light manufacturing, warehousing, dairies, and distribution with a recommended FAR of 0.25. Areas that may pose a concern in the future are:

- Undeveloped land north of I-64 and south of Highway 50 within APZ 2 designated for office/service use, especially the large parcel at the end of Edgewood Drive.
- Undeveloped property south of I-64 at the intersection of Wherry Road and Old IL-158 designated as business/industrial park within the APZ 2 and noise contour 70 L_{dn}
- Undeveloped property north of I-64 and south of Highway 50 within the noise contour 65 L_{dn} designated for business/ industrial park.



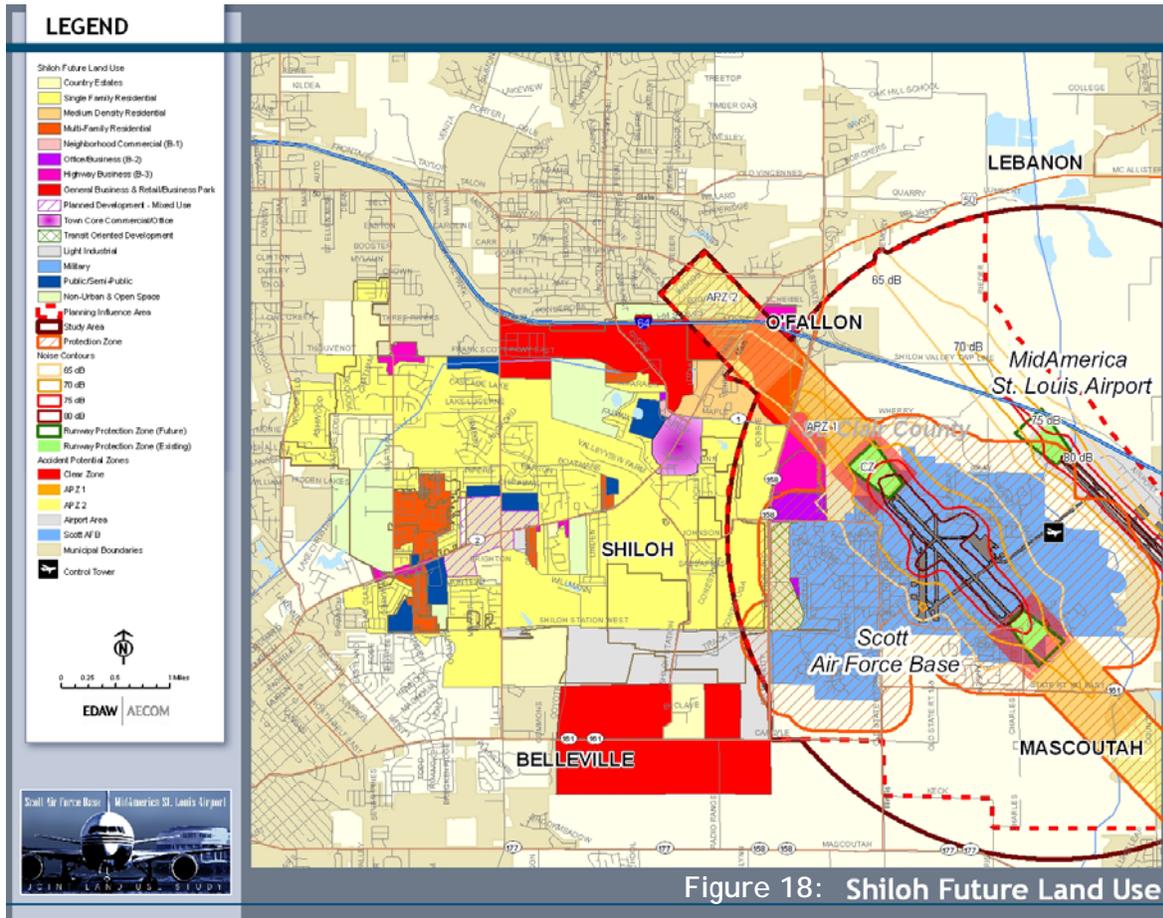


Figure 18: Shiloh Future Land Use

Village of Shiloh

The Comprehensive Plan for the Village concentrates retail and business services near I-64 and IL-158, as shown in Figure 18 - *Shiloh Future Land Use*. The districts around the Scott AFB safety zones and noise contours are “Highway Business” and “Retail Business Park.” The uses generally recommended for this area are retail, office and service uses intended to serve the local community and surrounding area. Also permitted with a Special Use permit are places of worship, schools, health care providers, and day care. Areas of potential future concern are:

- Retail Business Park designation for property west of IL-158 and north of Maple Street within the APZ 1 and 2 and within the 65 L_{dn} noise contour
- Highway Business designation for property along the east side of IL-158 near Wherry Road within the APZ 2 and noise contours 65 and 70 L_{dn}

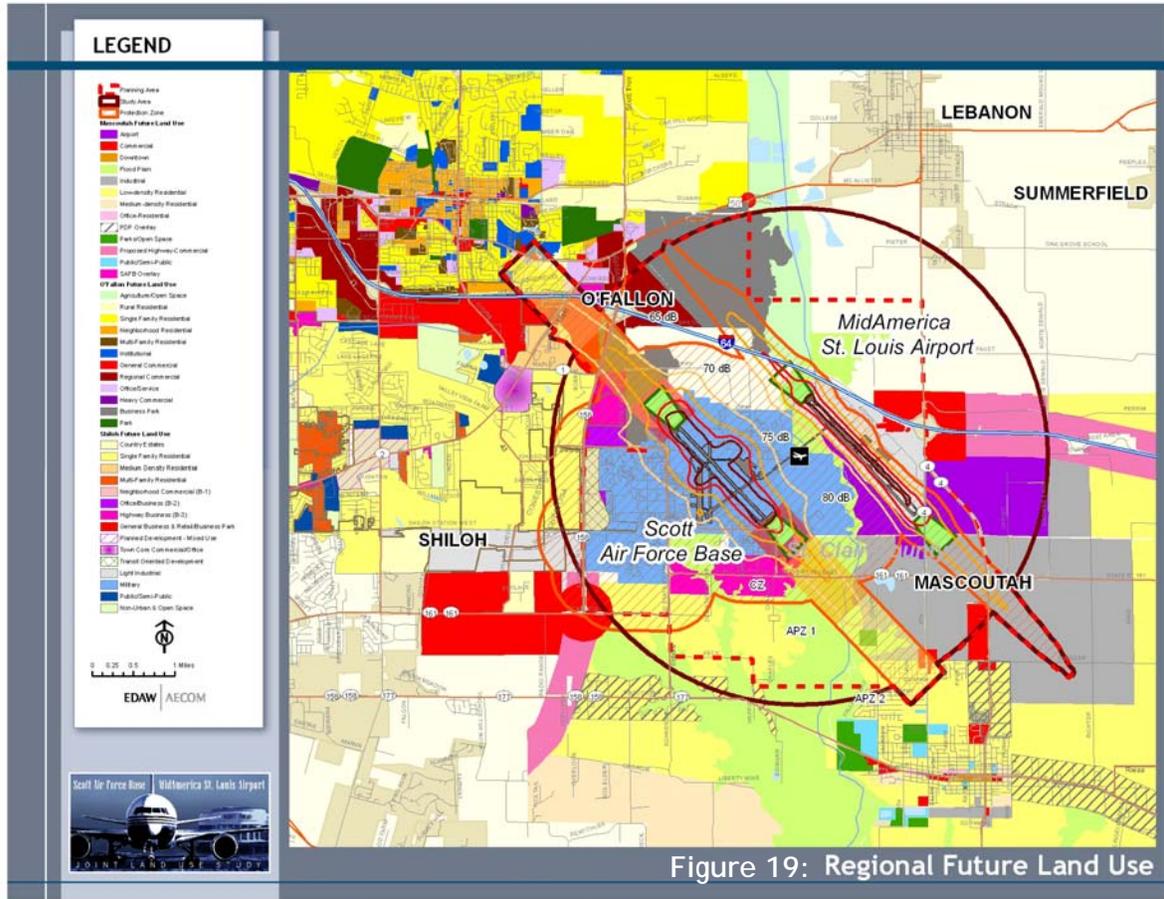


Figure 19: Regional Future Land Use

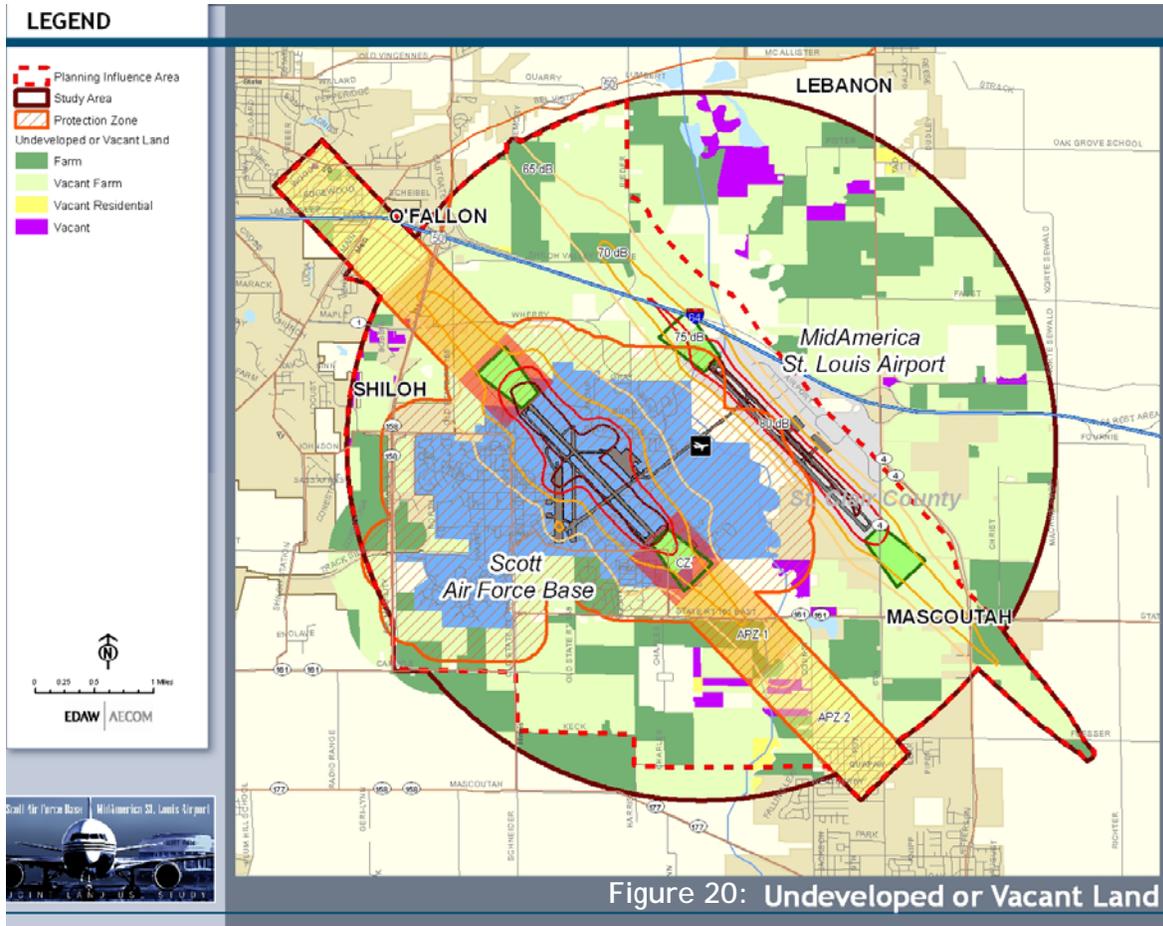


Figure 20: Undeveloped or Vacant Land

Build Out Analysis

The St. Clair County GIS database defines the vast majority of the land surrounding Scott AFB and MidAmerica St. Louis Airport as vacant (includes several categories: Farm, Vacant, Vacant Farm, and Vacant Residential). Many of the vacant parcels are large tracts that are relatively unencumbered by development constraints.

The planning team conducted a 'build-out' analysis to determine the potential maximum development of the study area. This analysis is not market-based, and is best used as a tool to determine areas in which future encroachment mitigation measures may be warranted.

Figure 20 - *Undeveloped or Vacant Land* shows all lands with future development potential. The planning team removed areas of parcels with environmental constraints, including the 100-year flood plain and wetlands. Then using current

zoning categories and development regulations, the analysis calculated the potential square footage of commercial, industrial, office and residential. Below is the table summarizing these calculations for the entire study area:

Table 16: Summary of Build Out

Land Use	Additional Units	Additional Square Feet
Single-family	336	
Multi-family	5	
Light Industrial		2,435,275
Industrial (other)		9,062,730
Office		1,990,342
Office/Commercial		3,261,148
Commercial		16,464,354

It was assumed that areas currently served by water and sewer would remain the same except for

the property north of the base where the City of O'Fallon plans to build a new sewer main.

Therefore, because much of the property in the study area is not served by these utilities, development intensity would remain low density rural residential or farm.

The resulting numbers do not necessarily reflect market conditions, but identify these areas of potential encroachment concern:

- Commercial development could be very intense along Route 4 in the City of Mascoutah
- Commercial development could be very intense along IL-158 Air Mobility Drive in the Village of Shiloh
- Industrial and commercial development could be very intense just north of the base on either side of I-64 within the City of O'Fallon
- Residential development within the City of Mascoutah could have a negative impact

2



Recommendations & Implementation

Scott Air Force Base
MidAmerica St. Louis Airport
Joint Land Use Study

In an effort to conserve paper, this document is formatted to be printed double sided

Overview

The JLUS document is intended to present a series of tools for minimizing land use conflicts between Scott Air Force Base, MidAmerica St. Louis Airport and the surrounding communities of O’Fallon, Mascoutah, Lebanon, the Village of Shiloh and St. Clair County. The recommendations presented here are the result of a thorough and good-faith effort to assess the existing and foreseeable affects of the joint airfields on the surrounding jurisdictions and to draw from the best practices of other defense and airport communities in the country. All of the entities, including the Air Force and the Airport have the prerogative of reviewing and selecting from among the recommended tools.

The purpose of the JLUS is to present a foundation of land use compatibility strategies to protect the military mission. Communities may choose more rigorous standards above these presented here if they feel it is appropriate to protect the welfare of their citizens. The Working Group evaluated a menu of tools based on such criteria as:

- Feasibility;
- Likely effectiveness;
- Availability of resources for implementation;
- The ability to protect the military mission and installation sustainability;
- The ability to protect the economic health of the region and individual property rights; and
- The overall ability to protect the health, safety , welfare and the quality of life for all local residents

This section is organized into four parts:

1. An overview of available encroachment reduction and communication tools;
2. A description of the JLUS planning areas and recommended land uses and intensities within each area;
3. A prioritized list of feasible action steps to be taken in the region; and
4. Implementation steps organized by responsible entity.

The Appendix includes land use compatibility guidelines, samples of recommended ordinances, and examples of legal agreements.

Overview of Tools

The tools are intended to address a variety of land use, operational and communication issues based on physical proximity to Scott Air Force Base and MidAmerica St. Louis Airport. The tools are strategies to promote compatible development near the two air fields, as well as establish ongoing mechanisms to support communication among all participating stakeholders.

Planning Documents and Policies: As part of this option, local governments include specific language about JLUS coordination as part of any Comprehensive Plan update or small area plans like corridor studies. These plans establish a firm legal basis for the implementation of compatibility actions. The plan can emphasize the relationship between the community and the military, the desire to promote cooperative land use planning such as agricultural conservation and environmental protection, and clear guidelines about appropriate future land use in areas vulnerable to encroachment.

Infrastructure: As part of this strategy, local governments would consider the impacts of both public and private infrastructure installation/extension (e.g. water and sewer facilities) into noise and safety affected areas around Scott AFB and the Airport. New infrastructure can induce or support incompatible growth patterns, such as denser residential development, especially if compatible zoning and land use guidelines are not in place.

A method for ensuring the consistency of infrastructure planning with desired goals of the community and the prevention of future incompatible growth is to link the Comprehensive Plan with the Capital Improvement Plan, the region's Transportation Improvement Plan, and other infrastructure plans.

Consultation: Under this approach, local governments would share information on community development proposals with Scott AFB and MidAmerica St. Louis Airport. Military and airport representatives would make recommendations to the local government based on the potential impacts of the proposed development on the installation or airport.

Regional Advisory Board: The State of Illinois already allows St. Clair County to use eminent domain authority to resolve incompatible land uses around the joint airfield¹. In an attempt to prevent the necessity of this aggressive tool, it is recommended that the affected communities create and adopt a board whose purpose is to review potentially incompatible development applications within a specific geography around Scott AFB. This Board, the Regional Advisory Board (RAB) would provide an interim step to address potentially incompatible land uses while still complying and meeting the spirit of the current Illinois law.

¹ County Air Corridor Protection Act, IL HB 1338, 2003

Members on the RAB would be appointed by local zoning authorities and would convene only when a proposed project is deemed incompatible by Scott AFB. The Board would present an advisory finding to the local jurisdiction responsible for approval of the application. The local authority would then make the final decision, though each jurisdiction may determine that a super-majority of votes is required to proceed with an application that the Board has found to be incompatible.

Memorandum of Understanding: The Memorandum of Understanding (MOU) is a "good faith" document that lays out procedures for communication among affected parties and formalizes collaboration among multiple stakeholders. All participating local governments, Scott AFB and MidAmerica St. Louis Airport would sign a general MOU.

Joint Boundary Agreements: Neighboring jurisdictions may also enter Joint Boundary Agreements to establish an understanding of where future annexations may occur and what land use intensity may be permitted. These agreements help each community produce a comprehensive land use plan that minimizes land use conflicts across jurisdictional lines. These agreements are especially advantageous near airports and military installations where encroachment can have a negative impact on an entire region.

Communications/Information: These tools establish clear mechanisms for information exchange among residents, local governments, and the military. Under this communications option, participating jurisdictions would develop appropriate mechanisms to ensure that residents, developers, businesses, and local decision-makers have adequate information about Air Force and Airport operations, possible impacts on lands surrounding the military installation, procedures to submit comments, and any additional local measures to promote

land use compatibility around the airfields. Examples of communication tools could include:

- Joint creation and distribution with the military of materials explaining base activities and compatibility issues. Governments should use all available media, including posters and web sites to convey the information;
- Post maps on local government websites to assist in identifying properties within designated noise, air safety and planning buffers;
- Create a web site where people can search individual parcels for information on noise or air safety issues/conditions and any easements or special development requirements attached to the property.

Real Estate Disclosure: Disclosure requires the release of information on possible impacts (dust, smoke, noise/vibration, air safety zones) to prospective buyers or renters as part of real estate transactions for properties close to Scott AFB and MidAmerica St. Louis Airport. Having a real estate disclosure ordinance/resolution in place educates individuals about the potential hazards and nuisances of nearby aircraft operations and it allows them to make well-informed decisions about property investment around military uses. Typically, the strongest disclosures take place at the earliest possible point of interaction between the realtor/real estate agent and the interested buyer/renter, such as the initial advertisement or listing of the affected property.

To ensure the full and effective release of information, jurisdictions requiring disclosure would work with the local real estate community to develop standard language on noise and other possible operational impacts. Local governments would implement this tool by adopting a local real estate disclosure

ordinance and seeking the participation of real estate professionals. Along with adopting a local ordinance to require disclosures, communities can also play a facilitator role by supporting voluntary disclosure in the real estate sector through the use of maps and searchable property database that identify affected properties, which are described in the *Communications/ Information* recommendation above.

Another option is for communities to lobby the state to mandate disclosure for properties affected by noise and air safety concerns around active airfields. Local governments can do this individually or partner together with the East-West Gateway Council of Governments.

Avigation and Noise Easements: An easement is the right granted to a third party to use private real property in a specified manner. An easement may be given, for example, for overhead wires, underground gas lines or roads. A noise or avigation easement is a property right acquired from a land owner that grants the right of military training impacts, including the right to:

- cause noise, vibration, dust, etc.
- ensure unobstructed airspace over the property above a specified height
- restrict or prohibit certain lights, electromagnetic signals, or land uses that could interfere with communications technology and safe aircraft operation.

The easement runs in perpetuity with the deed to the property and protects against lawsuits for military related impacts. Local governments, for example, may establish the granting of a noise easement by the developer as a condition for the approval of a proposed new home subdivision in areas subject to military training impacts. The cities of Mascoutah and O'Fallon

have enabling ordinances to require aviation easements.

Sound Attenuation: Attenuation refers to design and construction practices intended to lower the amount of noise that penetrates the windows, doors, and walls of a building. Local governments can require attenuation as part of building codes for new residential and other noise sensitive construction in certain noise affected areas.

Cluster Developments: Cluster subdivisions are intended to protect landscape features, such as wetlands and wildlife habitat. Local governments would implement a special provision for cluster zoning that recognizes those portions of a parcel within a noise/safety zone as prime candidates for the application of clustering. The site design would set aside areas subject to noise and safety constraints and allow denser, but compatible, development in areas outside of noise and hazard zones. This approach is density-neutral, so it allows the developer to build an equal number of housing units as would otherwise be permitted under conventional zoning.

Height Restrictions: In addition to density and site location, local governments may use zoning controls to regulate the impacts of tall structures such as cell towers on navigable airspace in flight corridors used by the airfields. Regulation would ensure that such structures are properly sited so as not to interfere with safe aircraft operation.

Outdoor Lighting Standards: Outdoor lighting systems, especially lighting associated with billboards, gas stations, major roadways, athletic fields, and large commercial or industrial uses often allow significant light to travel upward into an otherwise darkened sky. The resulting “light pollution” can obscure pilot vision or interfere with the use of night vision training devices. A lighting ordinance that requires fully shielded, cut-off exterior lighting

applications can reduce the excess illumination and thereby improve pilot navigation.

Land Use Regulations: These tools control the densities and placement of land use activities within established noise and safety zones around the base and airport to protect the health, safety, and welfare of the public. These options are intended to accommodate future growth while minimizing the concentrations of people and uses that may trigger conflicts with noise and operations. Since local jurisdictions exercise land use control through zoning, any of the regulatory actions described would be implemented through the established local government legislative process. The Working Group developed a thorough outline of recommended land uses and intensities within specific geographic boundaries, described below.

Planning Areas and Recommendations

Members of the JLUS Working Group established three planning areas in which specific regulations relating to land use, intensity of use, communication and other operational regulations are recommended. Each of the planning areas and its sub-areas are based on proximity to training activities, noise impacts, safety risks, or other operational impacts. Table 16, *Summary of Permitted Intensities by Planning Area*, summarizes the intensity recommendations for permitted uses by planning area. At the end of this section is Table 18, *Planning Area Recommendations*, details all the land use, intensity and communication recommendations for each of these. Figure 21- *Study Area – Planning Influence Area – Protection Zone* shows the physical location of the recommended planning areas.

Table 16: Summary of Permitted Intensities by Planning Area

Planning Area*	Permitted Intensities*		
	Residential	Commercial	Industrial
Approach/ Departure Area	No restrictions other than height limitations		
Planning Influence Area	No restrictions other than height limitations		
Protection Area			
<i>Installation Perimeter Buffer</i>	2 du/acre	Maximum height of 35 feet or 3 stories	
<i>Military Clear Zone</i>	None permitted	None permitted	None permitted
<i>Runway Protection Zone</i>	None permitted	None permitted	None permitted
<i>Military APZ 1</i>	None permitted	Maximum building footprint 8,000 sf and minimum side yard setback of 15 feet. Max. gross acreage coverage of 20%. Strip commercial prohibited and Planned Development approach encouraged	Sliding scale of employment and acreage coverage. Max. gross acreage coverage of 20% with 35 employees per shift. Planned Development approach encouraged
<i>Military APZ 2</i>	Maximum density of 1 dwelling unit per acre. 2 dwelling units per acre may be permitted with a maximum building coverage of 20% per acre.	Maximum building footprint 15,000 sf and minimum side yard setback of 10 feet. Max. gross acreage coverage of 40%. Strip commercial prohibited and Planned Development approach encouraged	Sliding scale of employment and acreage coverage. Max. gross acreage coverage of 40% with 35 employees per shift. Planned Development approach encouraged
<i>Military Noise Contours</i>	Sound attenuation in all noise contours. Residential uses (including hotels) prohibited altogether in 75 dB and above. Additional recommendation to limit density to 1 du per acre in 65-70 dB and prohibit all residential uses including hotels in 70 dB and above.	Sound attenuation in 70 dB and above. Uses prohibited in 80 dB and above.	Sound attenuation in 70 dB and above.
<i>Airport Noise Contours</i>	Sound attenuation in all noise contours. Residential uses (including hotels) prohibited altogether in 75 dB and above. Additional recommendation to limit density to 1 du per acre in 65-70 dB and prohibit all residential uses including hotels in 70 dB and above.	Sound attenuation in 70 dB and above	No restrictions

* properties in multiple areas should comply with the most restrictive intensity

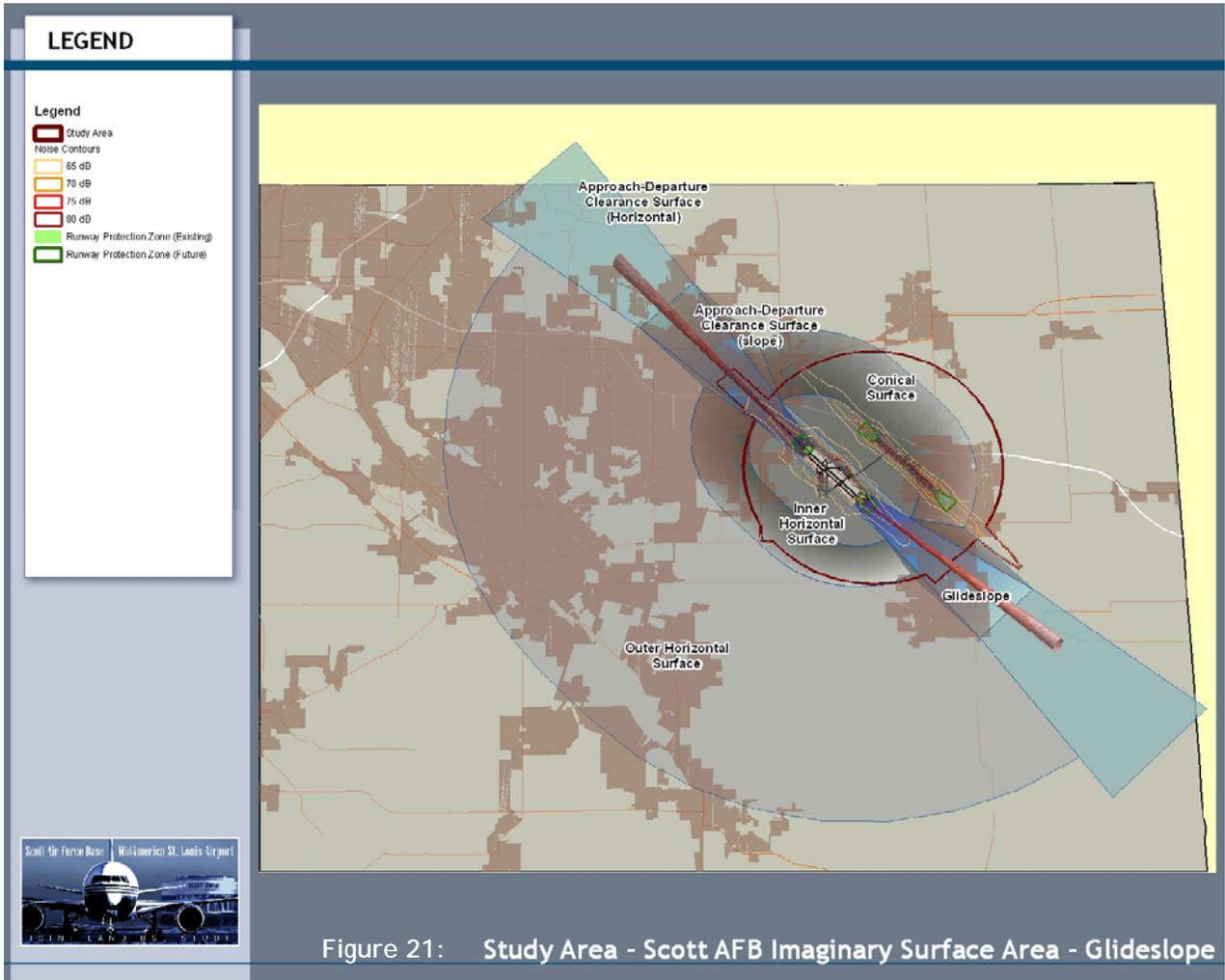


Figure 21: Study Area - Scott AFB Imaginary Surface Area - Glideslope

Approach and Departure Area:

- This area is the land within the approach and departure routes for the two airfields, as shown in the 3D model of the airfield Imaginary Surfaces, described in Part 1.
- The purpose of this area is to protect aircraft operations by limiting the height of airspace intrusions
- Recommendation is to limit structure height to 100 feet within the area. However, structures located within close proximity to the runways pose greater risks to aviators, and should, therefore, comply with the FAA Part 77, *Imaginary Surfaces* height restrictions. Table 17 depicts examples of height restrictions that would apply to adjacent properties within the Approach and Departure Area.

Table 17: Sample Height Restrictions

Distance (ft) from Runway Centerline	Maximum Height*
MidAmerica Approach/ Departure	
500	25
750	38
1,000	50
1,500	75
2,000	100
Scott AFB Approach/ Departure	
1,000	20
1,500	30
2,000	40
2,500	50
3,000	60
3,500	70
4,000	80
4500	90
5,000	100

*measured from runway elevation

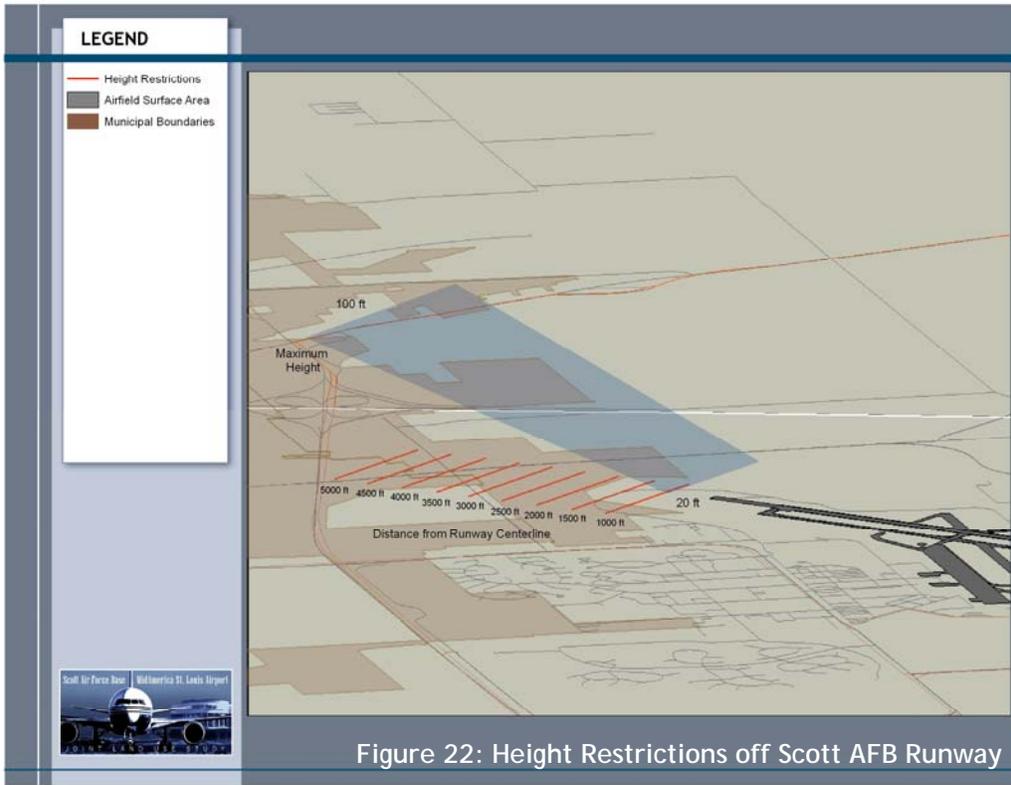


Figure 22: Height Restrictions off Scott AFB Runway

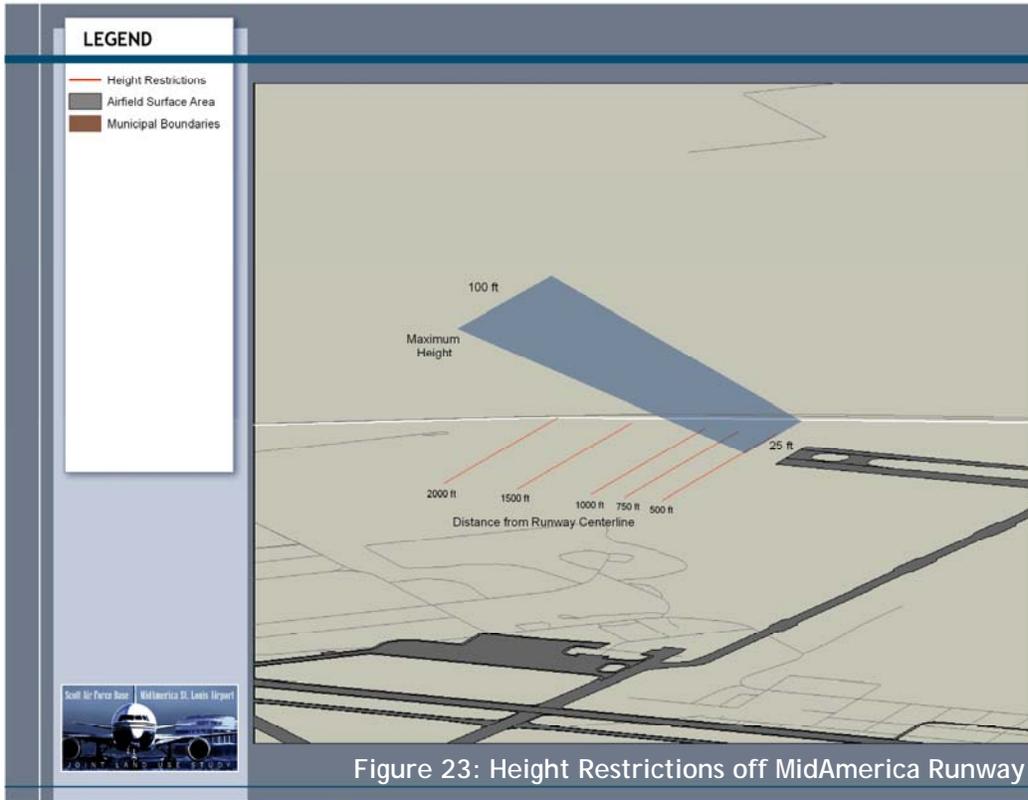


Figure 23: Height Restrictions off MidAmerica Runway

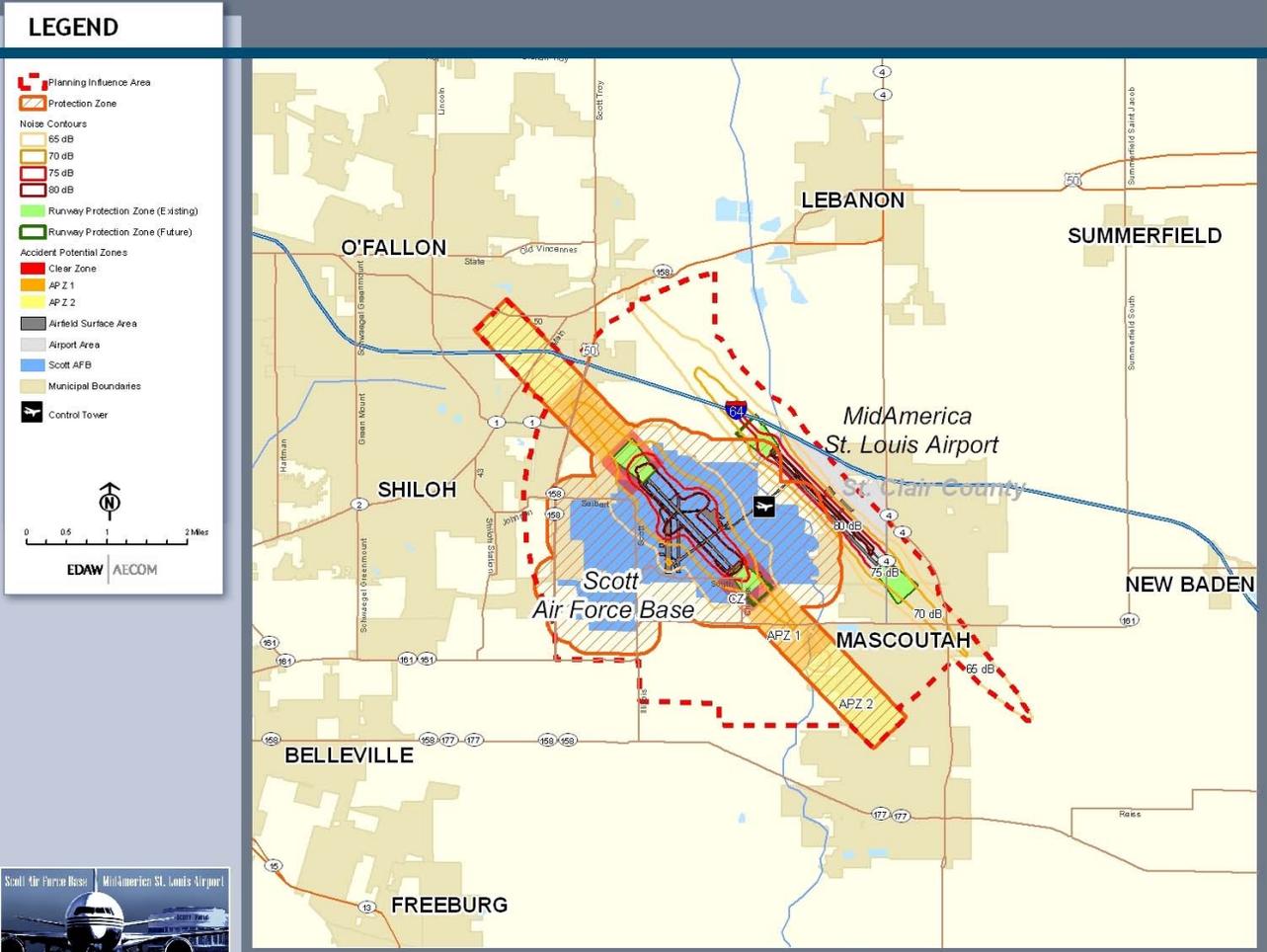


Figure 24: Planning Influence Area - Protection Zone

Planning Influence Area:

- This boundary follows natural and man-made features such as roads to assist local planners and officials in defining its limits.
- The purpose of this boundary is to identify an area for increased coordination and communication among local jurisdictions, the airport and the military. The purpose of this boundary is not to identify areas for reduced densities or development potential. Any recommended development conditions instead function as part of an overlay that allows underlying zoning to continue.
- Recommendations within the Planning Influence Area include:
 - Adopt outdoor lighting requirements. Current lighting ordinances adopted

by surrounding communities do not fully address military dark sky training needs. The International Association of Dark Skies is currently authoring a sample ordinance, but several good examples exist around the country. A lighting ordinance example and a sample of dark sky compliant lighting fixtures are included in the Appendix.

- Limit land uses that pose a higher risk of bird strikes to aircraft. Solid waste landfills, recycling centers, large bodies of open water that are two surface acres or larger should be prohibited.
- Formalize local government communication procedures with Scott AFB with a Memorandum of Understanding.

- Provide development permits, such as zoning applications (except agriculture), major subdivision plats (5 lots or more), major changes to the future land use map, corridor plans, Planned Development and Special Use permit applications to Scott AFB for review and advisory opinion.
- Conduct Joint Boundary Agreements or sign Memoranda of Understanding between neighboring communities.
- Require real estate disclosure of proximity to Scott AFB or Airport to potential buyers.
- Require avigation easements on all major subdivisions or rezoning approvals.
- Height restrictions as delineated by the approach and departure model.

Protection Area:

- The purpose of this boundary is to provide compatible land use planning and increase communication among all affected parties. Communities may wish to explore options for new zoning to allow compatible development.
- The entire Protection Area is divided into several sub-areas based on noise contours, safety and risk zones, and proximity to the base.
- Separate recommendations are made for military and civilian safety and risk zones based on the different requirements for each.
- Some property is included in more than one sub-area. In these cases, both standards should be applied; and if discrepancies exist, the stricter should apply.

Installation Perimeter Buffer Sub-Area:

- This area includes all lands within a 1,500 foot buffer around the perimeter of Scott AFB.
- Recommendations include all measures applicable to the Planning Influence Area plus:
 - Provide land development activity applications to Scott AFB for a compatibility review. Applications include zoning (except agriculture), major subdivision plats (5 or more lots), major changes to the future land use map, corridor plans, Planned Development and Special Use permit applications. If the finding is incompatible, meeting of the Regional Advisory Body is triggered.
 - No structures greater than 3 stories, or 35 feet above ground level, should be permitted.
 - Mobile home parks, multifamily residential, group homes or hotels should not be permitted.
 - Provide a maximum density of two single-family dwelling units per acre.

Military Clear Zone Sub-Area:

- This area includes lands within the north and south Clear Zones off the Scott AFB runway
- Recommendations include all measures for the Planning Influence Area plus:
 - Provide land development activity applications to Scott AFB for a compatibility review. Applications include zoning (except agriculture), major subdivision plats (5 or more lots), major changes to the future land use map, corridor plans, Planned Development and Special Use permit applications. If the finding

is incompatible, meeting of the Regional Advisory Body is triggered.

- No uses shall be permitted within the Clear Zone except roads, underground utilities, agriculture, livestock grazing, and permanent passive open space.

Military APZ 1 Sub-Area:

- This area includes lands within the north and south Accident Potential Zone 1 (APZ 1).
- Recommendations are all measures for the Planning Influence Area plus:
 - Provide land development activity applications to Scott AFB for a compatibility review. Applications include zoning (except agriculture), major subdivision plats (5 lots or more), major changes to the future land use map, corridor plans, Planned Development and Special Use permit applications. If the finding is incompatible, meeting of the Regional Advisory Body is triggered.
 - Manufacturing or above-ground bulk storage of flammable liquids or gases, or other explosive materials should be prohibited.

- No uses should be permitted that emit smoke, steam, gases or projectiles of any type that may interfere with safe aircraft operation.
- The maximum gross acreage coverage for all industrial uses shall be 20% and have no more than 35 employees per shift. A sliding scale of employment density per shift and maximum acreage cover should apply. (See Figure 25 - *Sliding Scale of Industrial Acreage Coverage and Employees in APZ 1*). A Planned Development approach is encouraged to maximize flexibility in layout and guide buildings away from the centerline of the runway.
- The maximum building footprint for all commercial uses including office, business, retail and wholesale trade shall be 8,000 square feet. Strip commercial centers should be explicitly prohibited.
- Prohibit all residential uses, including transient accommodations such as hotels.

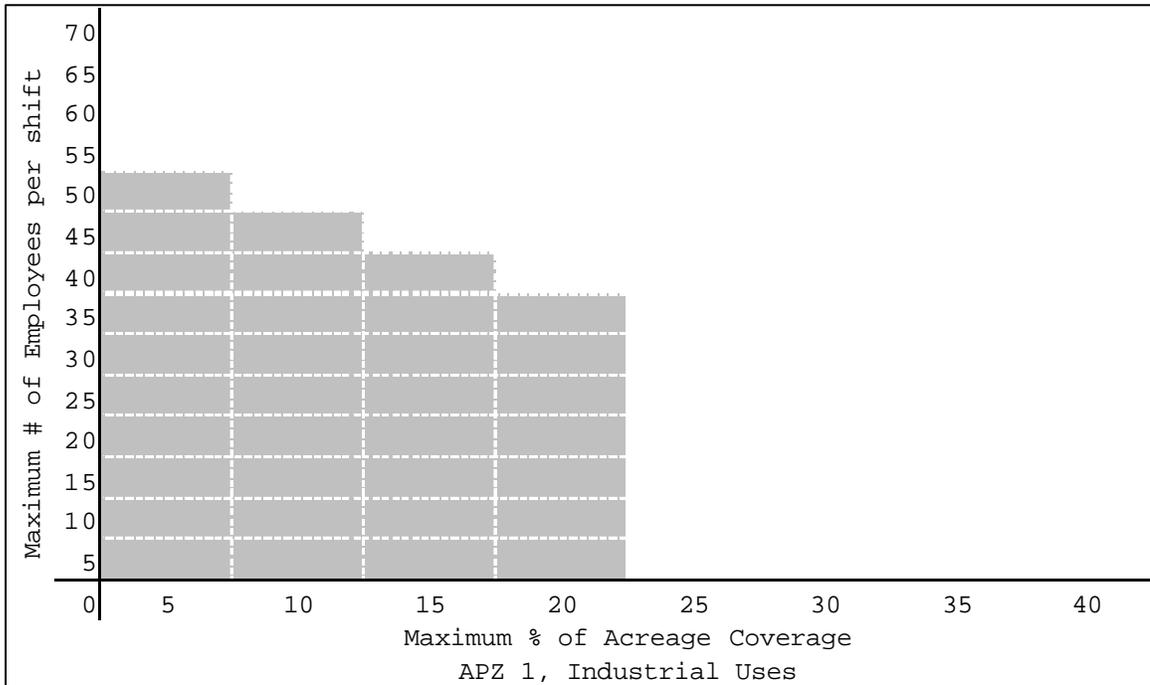


Figure 25: Sliding Scale of Industrial Acreage Coverage and Employees in APZ 1

- Prohibit hospitals and clinics, nursing homes, child care centers, schools, movie theaters and auditoriums, churches and places of worship, sports arenas, restaurants and other places of public assembly.
- Maximum assembly should be limited to 25 people per acre per hour over a 24-hour period, and not more than 50 people per acre at any one time.
- Active park uses and playgrounds, should be prohibited.

Military APZ 2 Sub-Area:

- This area includes lands within the Accident Potential Zone 2 (APZ 2).
- Recommendations are all measures applicable for the Planning Influence Area plus:
 - Provide development applications to Scott AFB for a compatibility review. Applications include zoning (except agriculture), major subdivision plats (5 lots or more), major changes to the future land use map, corridor plans, Planned Development and

Special Use permit applications. If the finding is incompatible, meeting of the Regional Advisory Body is triggered.

- Prohibit the manufacturing of or bulk storage of flammable liquids or gases, or other explosive materials
- No uses should be permitted that emit smoke, steam, gases or projectiles of any type that may interfere with safe aircraft operation.
- The maximum gross acreage coverage should be 40% and have no more than 35 employees per shift. A sliding scale of employment density and maximum acreage cover should apply. (See Figure 26) A Planned Development approach is encouraged to maximize flexibility in layout and guide buildings away from the centerline of the runway.
- The maximum building footprint for all commercial uses including office, business, retail and wholesale trade shall be 15,000 square feet. Strip commercial centers should be explicitly prohibited.

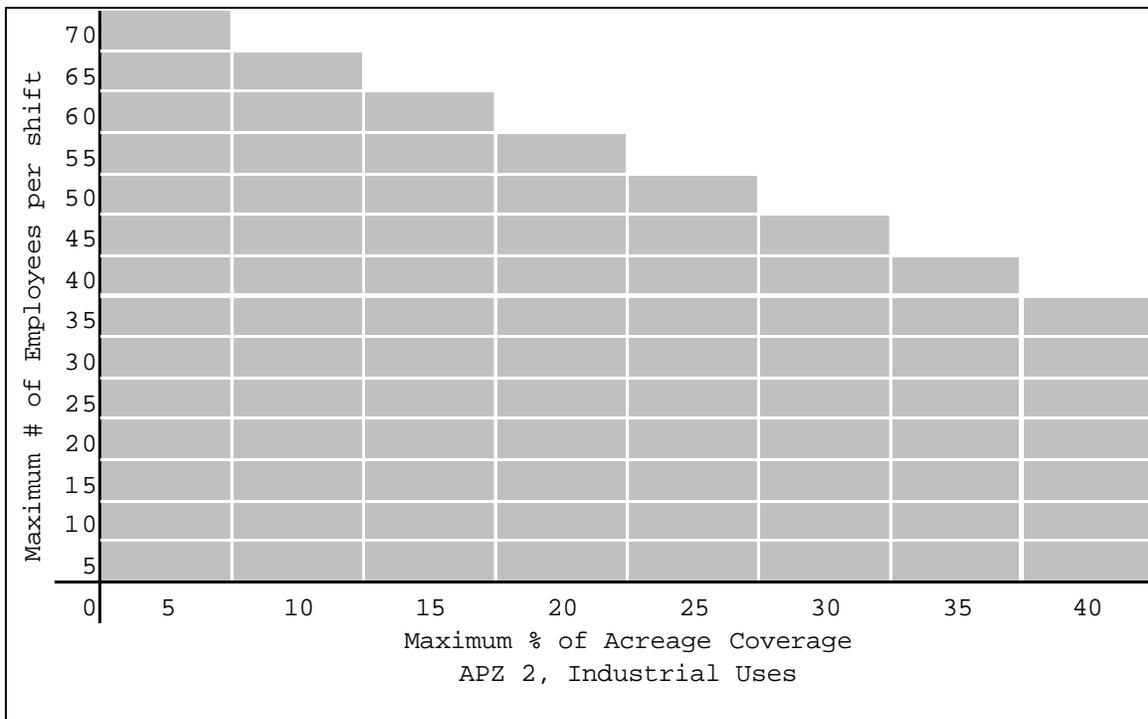


Figure 26: Sliding Scale of Industrial Acreage Coverage and Employees in APZ 2

- Prohibit hospitals and in-patient clinics, nursing homes, child care centers, schools, movie theaters and auditoriums, churches and places of worship, sports arenas, restaurants and other places of public assembly.
- Mobile home parks, multifamily residential, attached single family, group homes, dormitories or hotels should be prohibited.
- Limit single-family developments to a maximum density of one dwelling unit per acre. Two dwelling units per acre may be permitted with a maximum building coverage of 20% per acre.

Military Noise Contour Sub-Area:

- This area includes lands within the Scott AFB 65 L_{dn} Noise Contours (military only).
- Some properties are within an APZ and a noise contour. Recommendations for both sub-areas should apply to these properties.
- Recommendations include all measures for the Planning Influence Area plus:
 - Provide land development activity applications to Scott AFB for a compatibility review. Applications include zoning (except agriculture), major subdivision plats (5 lots or more), major changes to the future land use map, corridor plans, Planned Development and Special Use permit applications. If the finding is incompatible, meeting of the Regional Advisory Body is triggered.
 - Require noise easements to be granted to the local jurisdiction on all major subdivisions and rezoning requests. Require notes on all subsequent subdivision plats that property is near an airport and

therefore subject to operational noise impacts.

- Prohibit outdoor amphitheaters and mobile home parks in all noise contours.
- Require noise attenuation standards to achieve indoor to outdoor noise level reduction within portions of industrial structures in Noise Contours 70 and above. The portion of industrial structures where noise attenuation is applicable includes offices and reception areas. When property is located within an APZ and a noise contour, maximum acreage coverage and/or employment densities should be met in addition to noise attenuation measures.
- Require noise attenuation standards to achieve NRL of at least 25 dB on all new commercial construction including office, business, retail and wholesale trade within Noise Contours 70-75. When property is located within an APZ and a noise contour, maximum acreage coverage and/or employment densities should be met in addition to noise attenuation measures.
- When hospitals and clinics, nursing homes, child care centers, schools, movie theaters, auditoriums, churches and places of worship are not prohibited within the APZ, noise attenuation standards should be used to achieve a noise reduction level (NRL) of 25 dB within Noise Contour 65-70 and 30 dB within Noise Contour 70-75. These uses should not be permitted in Noise Contours greater than 75.
- Require noise attenuation standards to achieve NRL of at least 30 dB within the Noise Contours 70-75 and 25 dB within Noise Contours 65-70

- o on all new residential construction, including hotels.
- o Prohibit all residential uses and structures, including hotels within the 75-80 noise contours. All of the property affected by this level of noise is located on base.
- o Consider stricter standards of limiting new residential developments to a maximum density of one dwelling unit per acre within Noise Contour 65-70. Two dwelling units per acre may be permitted with a maximum building coverage of 20% per acre.
- o Consider stricter standards of prohibiting any new residential development including hotels within Noise Contour 70 dB and above.

Civilian Runway Protection Zone:

- This area includes lands within the Runway Protection Zones of the Airport. Most, if not all, of this land is owned by the Airport
- Recommendations include:
 - o No uses shall be permitted within the Runway Protection Zone except roads, underground utilities, agriculture, livestock grazing, and permanent passive open space.

Airport Noise Contour Sub-Area:

- This area includes all lands within the Airport 65 Ldn Noise Contours (civilian only).
- Recommendations within the Airport Noise Area include all measures for the Planning Influence Area plus:
 - o Prohibit outdoor amphitheaters and mobile home parks in all noise contours.
 - o All commercial uses including office, business, retail and wholesale trade

- o within Noise Contours 70-75 should use noise attenuation standards to achieve an NRL of at least 25 dB.
- o For hospitals, clinics, nursing homes, child care centers, schools, movie theaters, auditoriums, churches and places of worship, noise attenuation standards should be used to achieve an NRL of 25 dB within Noise Contour 65-70 and 30 dB within Noise Contour 70-75. These uses should not be permitted in Noise Contours greater than 75.
- o Require noise attenuation standards to achieve an NRL of at least 25 dB within the Noise Contours 65-70 and 30 dB within the Noise Contours 70-75 dB on all new residential construction, including hotels.
- o Prohibit all residential uses, including hotels, within the Noise Contours 70-75 and 75-80. Most of the property affected by the high noise levels within Noise Contours 75-80 is airport-owned.
- o Consider stricter standards of limiting new residential developments to a maximum density of one dwelling unit per acre within Noise Contour 65-70. Two dwelling units per acre may be permitted with a maximum building coverage of 20% per acre.
- o Consider stricter standards of prohibiting any new residential development including hotels within Noise Contour 70 dB and above.

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Table 18, Planning Area Recommendations

GOALS & OBJECTIVES	PROPOSED TOOL	PROPOSED USE RESTRICTIONS	PROPOSED INTENSITIES	NOTES AND OTHER TOOLS	AVAILABLE GUIDANCE
<i>APPROACH AND DEPARTURE AREA</i>					
Limit air space intrusions	Height Restrictions	Towers, antennas, and tall buildings	Height restrictions dependent on location within the Imaginary Surfaces. In general structures under 100 feet in height within the designated 3D modeled air space environment are compatible.		Air Field Imaginary Surfaces
<i>PLANNING INFLUENCE AREA- recommendations apply to all areas within the Planning Influence Area and the Protection Area</i>					
Provide dark skies for training and aviation operations	Lighting Ordinance	None	Require all commercial and industrial lighting, street lights and billboard lighting to illuminate downward and be 100% shielded	The Village of Shiloh and the City of O' Fallon have a lighting ordinance	International Dark Skies Association
Limit bird strike hazards	Land Use Prohibitions	Solid Waste Landfills, Recycling Centers, Open Bodies of Water that are 2 surface acres or larger (unless controlled by a nationally-recognized wildlife program)	None Permitted	USDA, Wildlife Services, National Wildlife Research Center is researching stormwater pond design for best practices.	
Strengthen communication between surrounding communities, Scott AFB and Airport	Communication	None	N/A	Provide land development activity applications to Scott AFB for review and advisory opinion	
Strengthen communication between surrounding communities and Scott AFB	Communication	None	N/A	Formalize the community's communication procedures with Scott AFB with a Memorandum of Understanding.	
Strengthen communication and coordination between neighboring communities	Communication	None	N/A	Enter into a Joint Boundary Agreement with neighboring communities, with emphasis on compatible land use planning around Scott AFB and the Airport	
Notify land owners and potential buyers/renters of proximity to airfields	Real Estate Disclosure	None	N/A	Potential buyers/renters must be notified of proximity to airfields as soon as feasible during real estate transactions.	
Protect existing and future aircraft operations in the vicinity of both air fields	Avigation Easements	None	N/A	Approval of major subdivisions or rezoning requests is contingent upon granting an avigation easement to the City or County. Notes required on all subdivision plats that property is near an airport and therefore subject to operational impacts.	

Table 18, Planning Area Recommendations

GOALS & OBJECTIVES	PROPOSED TOOL	PROPOSED USE RESTRICTIONS	PROPOSED INTENSITIES	NOTES AND OTHER TOOLS	AVAILABLE GUIDANCE
<i>PROTECTION AREA - divided into sub-areas</i>					
<i>Military Installation Perimeter Buffer Sub-Area</i>					
Strengthen communication between surrounding communities, Scott Air Force Base and MidAmerica St. Louis Airport	Communication	None	N/A	Provide land development activity applications to Scott AFB for a compatibility review. If the finding is incompatible, meeting of the Regional Advisory Body is triggered	
Provide secure border around military installation for Anti-Terrorism Force Protection (AT/FP) purposes	Height Restrictions	All Uses	No structures greater than 3 stories, or 35 feet above ground level, shall be permitted	This is more restrictive than the height restrictions proposed over the entire Planning Influence Area stated above	AT/FP guidance
Provide secure border around military installation for Anti-Terrorism Force Protection purposes	Residential Land Use Restrictions	Mobile home parks, multifamily residential, group homes, dormitories or hotels	None Permitted		AT/FP guidance
Limit incompatible development around military installation	Residential Land Use Restrictions	Single-family detached units	Maximum density of 2 dwelling units per acre		
<i>Military Clear Zone Sub-Area</i>					
Strengthen communication between surrounding communities, Scott Air Force Base and MidAmerica St. Louis Airport	Communication	None	N/A	Provide land development activity applications to Scott AFB for a compatibility review. If the finding is incompatible, meeting of the Regional Advisory Body is triggered	
Eliminate exposure of built safety risks to aviators within the Clear Zone	Land Use Restrictions	No uses shall be permitted within the Clear Zone except roads, underground utilities, agriculture, livestock grazing, and permanent passive open space	N/A		1981 DoD Guidelines prohibit all uses except roads, utilities, agriculture, livestock grazing, and permanent open space
<i>Military APZ 1 Sub-Area</i>					
Strengthen communication between surrounding communities, Scott Air Force Base and MidAmerica St. Louis Airport	Communication	None	N/A	Provide land development activity applications to Scott AFB for a compatibility review. If the finding is incompatible, meeting of the Regional Advisory Body is triggered	
Limit safety exposure risks within APZ 1 by prohibiting above-ground bulk storage of flammable liquids or gases, or other explosive materials	Prohibit Land Uses	Manufacturing or above-ground bulk storage of flammable liquids or gases, or other explosive materials. These users are usually grouped within the Heavy Industrial land use category	None Permitted		1981 DoD Guidelines, AICUZ Managers Handbook and various local zoning codes from across the country

Table 18, Planning Area Recommendations

GOALS & OBJECTIVES	PROPOSED TOOL	PROPOSED USE RESTRICTIONS	PROPOSED INTENSITIES	NOTES AND OTHER TOOLS	AVAILABLE GUIDANCE
<i>Military APZ 1 Sub-Area, continued</i>					
Limit number of people exposed to safety risks in APZ 1	Industrial Land Use Maximum Lot Coverage and Employment Densities	All industrial uses including manufacturing, distribution, and warehousing.	No uses shall be permitted that emit smoke, steam, gases or projectiles of any type that may interfere with safe aircraft operation. Within APZ 1, the maximum gross acreage coverage shall be 20% and have no more than 35 employees per shift. (See sliding scale graphic). A Planned Development approach is encouraged to maximize flexibility in layout and guide buildings away from the centerline of the runway.		AICUZ Project Manager's Guidebook suggests maximum lot coverage for non-residential uses be 20% and only 1 story. City of Aurora, CO has a sliding scale of employment density dependent on lot coverage and proximity to runway
Limit number of people exposed to safety risks in APZ 1	Commercial Land Use Maximum Building Footprint	All commercial uses including office, business, retail and wholesale trade.	Within APZ 1, the maximum building footprint shall be 8,000 square feet (this is roughly 20% of an acre). Side yard setback should be a minimum 15 feet, with portion of the building or permanent structure encroaching into the side yard. Strip commercial centers are prohibited, and a Planned Development approach should be encouraged.		AICUZ Project Manager's Guidebook suggests maximum lot coverage for non-residential uses be 20% and only 1 story
Limit safety exposure risks within APZ 1 by prohibiting uses that congregate large numbers of people or host people who have limited resources to respond to emergency situations	Prohibit Land Uses	Hospitals and clinics, nursing homes, child care centers, schools, movie theaters and auditoriums, churches and places of worship, sports arenas, restaurants and other places of public assembly	None Permitted	Appoint a representative from the school board to the County Planning Commission	1981 DoD Guidelines prohibit all of these uses
Limit number of people exposed to safety risks within APZ 1	Residential Land Use Restrictions	Mobile home parks, multifamily residential, attached single family, detached single-family, group homes, dormitories or hotels	None Permitted		No residential uses in APZ 1 per 1981 DoD guidelines
Limit the number of children exposed to safety risks within APZ 1	Recreational Land Use Restrictions	Playgrounds and active uses within parks	Active park uses and playgrounds, either municipal or within private developments, shall be prohibited within APZ 1		1981 DoD Guidelines prohibit playgrounds and neighborhood parks in APZ 1
<i>Military APZ 2 Sub-Area</i>					
Strengthen communication between surrounding communities, Scott Air Force Base and MidAmerica St. Louis Airport	Communication	None	N/A	Provide land development activity applications to Scott AFB for a compatibility review. If the finding is incompatible, meeting of the Regional Advisory Body is triggered	
Limit safety exposure risks within APZ 2 by prohibiting above-ground bulk storage of flammable liquids or gases, or other explosive materials	Prohibit Land Uses	Manufacturing or above-ground bulk storage of flammable liquids or gases, or other explosive materials. These users are usually grouped within the Heavy Industrial land use category	None Permitted		1981 DoD Guidelines, AICUZ Managers Handbook and various local zoning codes from across the country

Table 18, Planning Area Recommendations

GOALS & OBJECTIVES	PROPOSED TOOL	PROPOSED USE RESTRICTIONS	PROPOSED INTENSITIES	NOTES AND OTHER TOOLS	AVAILABLE GUIDANCE
<i>Military APZ 2 Sub-Area, continued</i>					
Limit number of people exposed to safety risks in APZ 2	Industrial Land Use Maximum Lot Coverage and Employment Densities	All industrial uses including manufacturing, distribution, and warehousing	No uses shall be permitted that emit smoke, steam, gases or projectiles of any kind that may interfere with safe aircraft operation. Within APZ 2, the maximum gross acreage coverage shall be 40% and have no more than 35 employees per shift. (See sliding scale graphic). Side yard setback should be a minimum 10 feet, with portion of the building or permanent structure encroaching into the side yard. A Planned Development approach is encouraged to maximize flexibility in layout and guide buildings away from the centerline of the runway.		AICUZ Project Manager's Guidebook suggests maximum lot coverage for non-residential uses should be 20% and should only be one story. City of Aurora, Colorado has a sliding scale of employment density dependent on lot coverage and proximity to runway
Limit number of people exposed to safety risks in APZ 2	Commercial Land Use Maximum Building Footprint	All commercial uses including office, business, retail and wholesale trade	Within APZ 2, the maximum building footprint shall be 15,000 square feet (this is roughly 35% of an acre). Side yard setback should be a minimum 10 feet, with portion of the building or permanent structure encroaching into the side yard. Strip commercial centers are prohibited, and a Planned Development approach should be encouraged.		AICUZ Project Manager's Guidebook suggests maximum lot coverage for non-residential uses should be 20% and should only be one story
Limit safety exposure risks within APZ 2 by prohibiting uses that congregate large numbers of people or host people who have limited resources to respond to emergency situations	Prohibit Land Uses	Hospitals and in-patient clinics, nursing homes, child care centers, schools, movie theaters and auditoriums, churches and places of worship, sports arenas, restaurants and other places of public assembly	None Permitted	Appoint a representative from the school board to the County Planning Commission	1981 DoD Guidelines prohibit all of these uses
Limit number of people exposed to safety risks within APZ 2	Residential Land Use Restrictions	Mobile home parks, multifamily residential, attached single family, group homes, dormitories or hotels	None Permitted		No Multifamily, attached residential, group quarters, residential hotels or mobile home parks permitted per 1981 DoD guidelines
Limit number of people exposed to safety risks within APZ 2	Residential Land Use Restrictions	Single-family detached units	Maximum density of 1 dwelling unit per acre in APZ 2. 2 dwelling units per acre may be permitted with a maximum building coverage of 20% per acre.		1-2 du per acre in APZ 2 only per 1981 DoD guidelines

Table 18, Planning Area Recommendations

GOALS & OBJECTIVES	PROPOSED TOOL	PROPOSED USE RESTRICTIONS	PROPOSED INTENSITIES	NOTES AND OTHER TOOLS	AVAILABLE GUIDANCE
<i>Military Noise Contour Sub-Area - some properties are in both an APZ and a Noise Contour, so both requirements should apply</i>					
Strengthen communication between surrounding communities, Scott Air Force Base and MidAmerica St. Louis Airport	Communication	None	N/A	Provide land development activity applications to Scott AFB for a compatibility review. If the finding is incompatible, meeting of the Regional Advisory Body is triggered	
Protect existing and future aircraft operations in the vicinity of both air fields	Noise Easements	None	N/A	Approval of major subdivisions or rezoning request contingent upon granting noise easement to the jurisdiction. Notes required on subdivision plats that property is near an airport and subject to operational noise impacts.	
Minimize the number of people exposed to noise within all Noise Contours	Prohibit Land Uses	Outdoor amphitheaters and mobile home parks	None permitted in any noise contour		FICUN Guidelines
Minimize noise exposure to industrial uses within Noise Contours 70 and above	Industrial Noise Attenuation Building Standards	Portions of industrial structures such as offices and reception areas should include noise attenuation	Noise attenuation standards to achieve outdoor to indoor Noise Level Reductions in portions of industrial structures		AICUZ Program Manager's Guide, US Air Force 1999
Minimize noise exposure to all commercial uses within Noise Contours 70-75	Commercial Noise Attenuation Building Standards	All commercial uses including office, business, retail and wholesale trade	Noise attenuation standards to achieve outdoor to indoor Noise Level Reductions of at least 25 dB	When property is also within an APZ and a noise contour, both standards should be met	FICUN Guidelines
Minimize noise exposure to noise-sensitive uses where a quiet environment is typically expected within all Noise Contours	Commercial Noise Attenuation Building Standards	Hospitals and clinics, nursing homes, child care centers, schools, movie theaters and auditoriums and churches and places of worship	When not prohibited within the APZ, noise attenuation standards should be used to achieve an NRL of 25 dB within Noise Contour 65-70 and 30 dB within Noise Contour 70-75. These uses should not be permitted in Noise Contours greater than 75		FICUN Guidelines
Minimize indoor noise levels for new residential construction within the Noise Contours 65-70	Residential Noise Attenuation Building Standards	All residential uses and structures, including hotels	Noise attenuation standards to achieve outdoor to indoor Noise Level Reductions of at least 25 dB	When property is located within an APZ and a noise contour, residential densities should meet the recommendations above <i>and</i> include noise attenuation measures	FICUN Guidelines discourages any residential uses in this noise contour area
Minimize indoor noise levels for new residential construction within the Noise Contours 70-75	Residential Noise Attenuation Building Standards	All residential uses and structures, including hotels	Noise attenuation standards to achieve outdoor to indoor Noise Level Reductions of at least 30 dB	When property is located within an APZ and a noise contour, residential densities should meet the recommendations above <i>and</i> include noise attenuation measures	FICUN Guidelines <i>strongly</i> discourages any residential uses in this noise contour area
Prohibit residential exposure to noise within the Noise Contours 75-80	Land Use Restrictions	All residential uses and structures, including hotels	None permitted	All 75-80 property is located on-base	FICUN Guidelines

Table 18, Planning Area Recommendations

GOALS & OBJECTIVES	PROPOSED TOOL	PROPOSED USE RESTRICTIONS	PROPOSED INTENSITIES	NOTES AND OTHER TOOLS	AVAILABLE GUIDANCE
<i>Civilian Runway Protection Zone Sub-Area</i>					
Eliminate exposure of built safety risks to aviators within the Runway Protection Zone	Land Use Restrictions	No uses shall be permitted within the Runway Protection Zone except roads, underground utilities, agriculture, livestock grazing, and permanent passive open space	N/A	Most, if not all of the Runway Protection Zone is owned by the Airport	
<i>Airport Noise Contour Sub-Area</i>					
Minimize the number of people exposed to noise	Prohibit Land Uses	Outdoor amphitheaters and mobile home parks	None permitted in any noise contour		FAA Part 150 Land Use Compatibility Table, Appendix 1
Minimize noise exposure to all commercial uses within Noise Contours 70-75	Commercial Noise Attenuation Building Standards	All commercial uses including office, business, retail and wholesale trade	Noise attenuation standards to achieve Noise Level Reductions of at least 25 dB		FAA Part 150 Land Use Compatibility Table
Minimize noise exposure to noise-sensitive uses where a quiet environment is typically expected within all Noise Contours	Commercial Noise Attenuation Building Standards	Hospitals and clinics, nursing homes, child care centers, schools, movie theaters and auditoriums and churches and places of worship	Noise attenuation standards should be used to achieve an NRL of 25 dB within Noise Contour 65-70 and 30 dB within Noise Contour 70-75. These uses should not be permitted in Noise Contours greater than 75.		FAA Part 150 Land Use Compatibility Table
Prohibit residential exposure to noise within the Noise Contours 75-80	Residential Land Use Restrictions	All residential uses and structures, including hotels	None permitted	Property affected by this Noise Contour is mostly Airport-owned	FAA Part 150 Land Use Compatibility Table
Minimize indoor noise levels for new residential construction within the Noise Contours 70-75	Residential Noise Attenuation Building Standards	All residential uses and structures, including hotels	Noise attenuation standards to achieve outdoor to indoor Noise Level Reductions of at least 30 dB	Consider prohibiting residential uses within this noise contour, see following recommendation	FICUN Guidelines <i>strongly</i> discourages any residential uses in this noise contour area. FAA Part 150 Land Use Compatibility Table recommends indoor noise level reductions
Limit residential exposure to the higher noise levels within Noise Contours 70-75	Residential Land Use Restrictions	All residential uses and structures, including hotels	None permitted	In lieu of or in addition to recommendation above	FICUN Guidelines <i>strongly</i> discourages any residential uses in this noise contour area. FAA Part 150 recommends indoor noise level reductions
Minimize indoor noise levels for new residential construction within the Noise Contours 65-70	Residential Noise Attenuation Building Standards	All residential uses and structures, including hotels	Noise attenuation standards to achieve outdoor to indoor Noise Level Reductions of at least 25 dB	Consider limiting number of residential units within this noise contour, see following recommendation	FICUN Guidelines discourages any residential uses in this noise contour area. FAA Part 150 recommends indoor noise level reductions
Limit residential exposure to the higher noise levels within Noise Contours 65-70	Residential Land Use Restrictions	All residential uses and structures, including hotels	Maximum density of 1 dwelling unit per acre. 2 dwelling units per acre may be permitted with a maximum building coverage of 20% per acre.	In lieu of or in addition to recommendation above	FICUN Guidelines discourages any residential uses in this noise contour area. FAA Part 150 recommends indoor noise level reductions

Prioritized List of Feasible Encroachment Reduction Measures

Most of the surrounding communities have adopted some of the best compatibility practices available to defense communities throughout the country. A review of current measures, however, indicates critical gaps in the region’s encroachment reduction approach, both in the form of geographic areas that remain unregulated and/or existing policies that require stronger provisions.

The following is a list of feasible, near-term measures developed on the basis of the planning team’s compatibility findings and feedback from area stakeholders and officials.

1. Adopt and Ratify the Regional Advisory Board

During the JLUS process, locally elected officials agreed to the value of a Regional Advisory Board (RAB) to coordinate and review land use decisions around Scott AFB and MidAmerica St. Louis Airport. The RAB will consist of one policy-maker from each of the following entities:

- Scott AFB
- St. Clair County
- The Village of Shiloh
- The City of Mascoutah
- The City of O’Fallon

The trigger for convening the RAB will be a finding by the Air Force that approval of a development application is incompatible (based on AICUZ guidance) in the Protection Zone as defined above in the Planning Areas section. The RAB will act as a strictly advisory body. However, local governments may consider adopting a provision that requires a super-majority vote from the local legislative body to

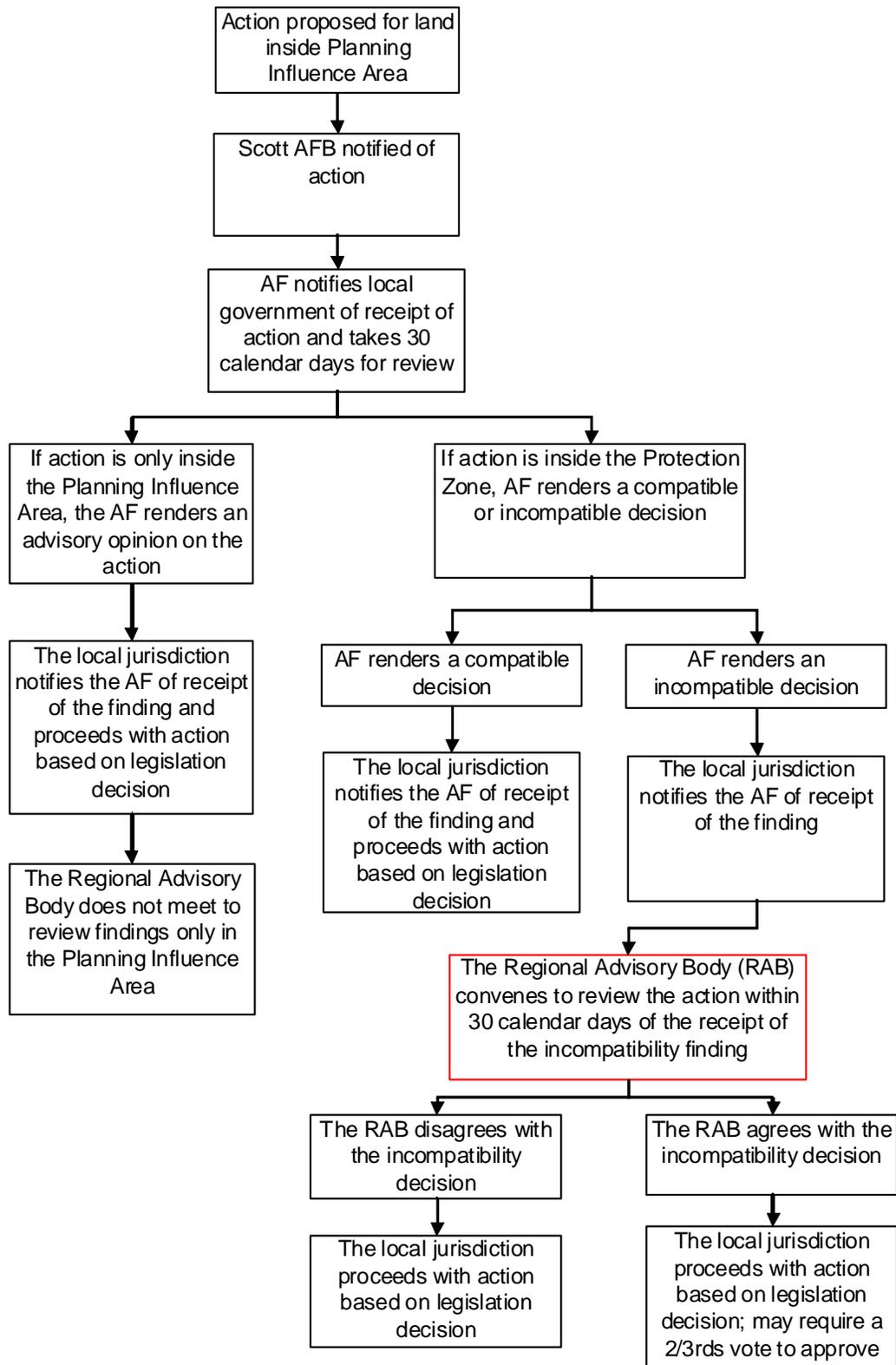
approve an application after the RAB has found it to be incompatible.

The process for a development application within the Protection Zone would follow this process: (See Figure 27)

- The local governments will notify the Air Force of those actions (rezonings, subdivisions, development proposals, changes in the future land use, etc.) inside the Planning Influence Area.
- The Air Force will review these actions within a 30 calendar day period and render an advisory opinion on those actions only inside the Planning Influence Area and a compatible/incompatible decision for those actions inside the smaller Protection Zone.
- If the Air Force finds an application within the Protection Area to be incompatible, the RAB will meet within a 30 calendar day period following an incompatible finding. The Air Force has agreed to provide administrative support for the scheduling of the RAB meeting and the distribution of necessary background materials.
- The RAB will render a finding, which the local government shall consider. The local government should not make a final decision without first receiving the finding from the RAB.

Note that as currently defined, the RAB would only meet to review those actions that draw an incompatible finding from the Air Force inside the Protection Zone. It is the conclusion of the Policy Committee to begin with this narrower area of review and to consider expansion of the review to the broader Planning Influence Area at a later time.

Figure 27: Process Chart for the Regional Advisory Board Review



2. Update Zoning Codes to Include JLUS Planning Areas with Recommended Land Uses and Intensities

Through the JLUS planning process, committee members established several planning boundaries with the intent to make specific recommendations for regulations and policies. These boundaries and recommendations are described above in the Planning Areas section. The purpose of these boundaries, especially when recommendations include land use controls, is to closely link regulations to specific impacts experienced in those areas. The purpose of the JLUS is to lay out a foundation of land use compatibility strategies on which to build local jurisdictional planning efforts around the base and airport. The adoption of clear and regionally consistent criteria to assess compatibility will make for sounder and more predictable land use decision-making.

Since jurisdictions vary in the level and type of operational impact, an itemized list of action steps to be taken by each community is included in the following section. Jurisdictions with existing codes that are more stringent may choose to maintain current standards. The adoption of the planning areas into the zoning code will help address some of the potential areas of encroachment concern identified in Part One of this document. Those areas are:

- Undeveloped property in the City of O’Fallon along Hwy 50
- Undeveloped property along IL 158 near Scott AFB (this is in multiple jurisdictions)
- Property along Maple Street near the intersection with IL 158 in the Village of Shiloh
- Property along IL 161 designated for industrial and Scott AFB-related uses in the City of Mascoutah and St. Clair County

- Commercial property at the intersection of West Fuesser Road and North 6th Street in the City of Mascoutah
- Commercial and industrial property along Route 4 in the City of Mascoutah
- Future development around the proposed Reider Road interchange in the City of O’Fallon and St. Clair County

3. Adopt or Update Outdoor Lighting Ordinances

Continued community growth, particularly along Interstate 64, IL-158, Highway 50 and Route 4 in the vicinity of Scott AFB and MidAmerica St. Louis Airport will continue to flood the night sky with light pollution from over-lighting and unshielded lighting. Light pollution adversely affects night vision device (NVD) operation and could curtail future night time training and readiness activities at the base. Regulations that minimize interference with the NVD environment do not require the strict prohibition of exterior lighting or the complete replacement of existing lighting fixtures. Instead, regulations focus on the installation of less intrusive lighting applications either for new development or as part of the routine maintenance/replacement of public utilities.

The supporting Appendix contains a model lighting ordinance that requires fully shielded lighting applications for new nonresidential uses. The ordinance is a prescriptive-based code that regulates the installation of new lighting systems, modifications to existing lighting systems or the replacement of lighting fixtures for non-residential uses, common residential areas and street lights. Also included in the Appendix is a list of light fixtures that meet dark-sky standards.

Local communities and Scott AFB should work closely with IDOT on the design and installation of lighting along I-64, especially at the new

potential interchange at Reider Road. Other interchanges in the area such as Exits 19 and 23 may be candidates for dark-sky approved lighting fixtures when existing fixtures need to be repaired or replaced.

4. Encourage Planned Developments Wherever Feasible

Because property around military installations and airfields can have special needs, using the planned development process often results in a better overall project. The planned development process's flexibility allows a developer to create a tailored site design and program to address the impacts from nearby military or aircraft operations. Environmental considerations, land uses, lot coverage, height concerns and lighting design can all be addressed through the planned development process while ensuring that the land owner creates a successful and profitable development.

While large scale projects are more apt to use the planned development process, smaller developments should also be encouraged to use this flexible design process. Some local codes require a minimum lot size for planned developments, thereby limiting the ability to use this tool. In these cases, local jurisdictions may wish to implement a Special Permit application process required for all developments in close proximity to the military installation and airport, so that incremental development is beneficial to the entire region.

5. Adopt Height Restrictions

Airspace intrusions can limit aircraft maneuverability and affect military training. Although FCC regulations apply to all communication towers, additional recommendations are to limit height of towers and structures to 100 feet within the planning areas.

The approach and departure zones for each airfield are especially sensitive to airspace intrusions. These zones and all of the Airfield

Imaginary Surfaces as defined by the FAA are incorporated in the 3-D Geographic Information Systems (GIS) model included in the JLUS.

6. Update and/or Adopt Noise Attenuations Standards In Building Codes

While residential encroachment in areas impacted by significant levels of aircraft noise can be controlled through comprehensive planning and zoning, another technique to reduce the effects of aircraft noise on people is to establish sound attenuation requirements for new construction. Typically the sound attenuation requirements are incorporated into the Building Code² of the affected jurisdiction(s).

Most building code regulations are developed to protect the public safety and welfare. Controlling noise involves public welfare because sleep, communication, and psychological factors are involved. Therefore, the incorporation of noise attenuation standards into local building codes for noise-sensitive land uses is a valid means of protecting the public welfare. Combined with zoning, noise insulation standards offer a means of achieving land use compatibility in areas exposed to high levels of noise without causing any undue disruption to existing land use and future plans.

This recommendation presents general construction requirements/techniques to achieve noise level reductions and information related to the cost of new construction with and without additional sound attenuation. A draft amendment to the International Code Council's 2003 International Building Code to require sound attenuation of new or redeveloped is included in the Appendix.

² The cities of O'Fallon, Shiloh, and Mascoutah have all adopted the International Code Council's 2003 International Building Code.

Table 19: General Construction Requirements to Achieve 25 dB Noise Level Reduction

Element	Location	STC	Requirement
Exterior walls	All perimeter walls	39	2 x 4 stud wall required with 5/8-inch exterior sheathing and 5/8-inch gypsumboard or plaster interior
Exterior walls	All perimeter walls		Insulation grade R-9 required
Exterior walls	All perimeter walls		No thru-wall HVAC
Windows	All habitable rooms	30	Stucco, brick, or siding homes - STC 30
Windows	All bedrooms		Window area max. 20% of floor area
Exterior doors	All doors to house	28	1-3/4-inch prime solid-core wood or insulated metal
Exterior doors	All doors to house		No thru-door openings
Roof construction	Entire house	39	Rafter depth 6 inches or more
Attic and kneewall	Vented attic and pitched roof		Insulation grade R-19 required
Ceiling	All habitable rooms	28	1/2-inch-thick gypsumboard or plaster
Ceiling under roof	All habitable rooms		Skylights STC-28
Floor	Over crawl space		Max vent area 2% of floor area
Ventilation	Entire house		Fresh air requirements met with windows and doors closed
Ventilation	Kitchen		Baffle vents to exterior
Ventilation	Attic		Code Minimum Number Gravity Vents

level from exterior sources in many ways. Construction methods should be chosen by the builder, subject to other building and safety regulations.

General Construction Requirements to Achieve Noise Level Reductions in Airport

Tables 19 through 21 provide a summary of general construction requirements to achieve specific noise level reductions and the Sound Transmission Class (STC)³ of various types of building construction elements.

These tables were reproduced from a study prepared by Wyle Research and Consulting for Wright-Patterson Air Force Base. It should be noted that a structure can be designed to achieve the maximum acceptable interior noise

³ Sound Transmission Class (STC) - Sound transmission class (STC) is a single number rating of the sound transmission loss (the reduction of sound energy passing through a building material) of a wall or structure which attempts which attempts to account for the variation in transmission loss with frequency.

Table 20: General Construction Requirements to Achieve 30 dB Noise Level Reduction

Element	Location	STC	Requirement
Exterior walls	All perimeter walls	44	2 x 4 stud wall required with 5/8-inch exterior sheathing and 5/8-inch gypsumboard or plaster interior
Exterior walls	All perimeter walls		Interior walls resiliently mounted
Exterior walls	All perimeter walls		Insulation grade R-11 required
Exterior walls	All perimeter walls		No thru-wall HVAC
Windows	All habitable rooms	36/40	Stucco or brick homes - STC 36; siding homes - STC 40
Windows	All bedrooms		Window area max. 20% of floor area
Exterior doors	All doors to house	35	1-3/4-inch prime and storm door
Exterior doors	All doors to house		No thru-door openings
Roof construction	Entire house	44	Rafter depth 6 inches or more
Attic and kneewall	Vented attic and pitched roof		Insulation grade R-19 required
Ceiling	Habitable rooms under pitched roof with attic	44	5/8-inch-thick gypsumboard or plaster
Ceiling under roof	All habitable rooms		No skylights
Floor	Lowest occupied rooms	49	Slab or enclosed basement/crawlspace
Floor	Over crawl space		Insulation grade R-9 required
Ventilation	Entire house		Fresh air requirements met with windows and doors closed
Ventilation	Kitchen		Baffle vents to exterior
Ventilation	Attic		No gravity vents
Miscellaneous	All habitable rooms		No vented fireplaces

Table 21: General Construction Requirements to Achieve 35 dB Noise Level Reduction

Element	Location	STC	Requirement
Exterior walls	All perimeter walls	49	2 x 4 staggered stud wall required with 5/8-inch exterior sheathing and sealed top and bottom and 1-inch gypsumboard or plaster interior
Exterior walls	All perimeter walls		Interior wall not rigidly connected to exterior wall studs
Exterior walls	All perimeter walls		Insulation grade R-11 required
Exterior walls	All perimeter walls		No thru-wall HVAC
Windows	All habitable rooms	40/24	Brick homes - STC 40; stucco or siding homes - STC 42
Windows	All bedrooms		Window area max. 20% of floor area
Exterior doors	All doors to house	38	1-3/4-inch prime and storm door
Exterior doors	All doors to house		No thru-door openings
Roof construction	Entire house	49	Rafter depth 6 inches or more
Attic and kneewall	Vented attic		Insulation grade R-30 required
Ceiling	Habitable rooms under cathedral ceiling, flat or pitched roof without attic		Resilient ceiling attachment
Ceiling	All habitable rooms		1-inch-thick gypsumboard or plaster
Ceiling under roof	All habitable rooms		No skylights
Floor	Lowest occupied rooms	49	Slab or enclosed basement/crawlspace
Floor	Over crawl space		Insulation grade R-11 required
Ventilation	Entire house		Fresh air requirements met with windows and doors closed
Ventilation	Kitchen		No vents direct to exterior
Ventilation	Attic		No gravity vents
Miscellaneous	All habitable rooms		No vented fireplaces

Cost Implications for New Construction

The cost to build a new home with additional sound attenuation is usually slightly higher than the cost to build a standard home. Variables that affect the cost of building a sound attenuated home versus a standard home include home design, availability and cost of construction materials, climate, desired exterior to interior noise level reduction (NLR), and local construction techniques. While some design considerations (e.g., locating bedrooms away from potential noise sources) have no cost associated with them other design considerations (e.g., using double or triple pane windows) have obvious cost implications. While costs will vary on a case by case basis it is estimated that the cost of constructing a sound attenuated home in the environs of Scott Air Force Base/MidAmerica St. Louis Airport would be between \$5,000 and \$10,000 more than constructing a standard home assuming a desired NLR of 25 decibels.

7. Require Avigation and Noise Easements on Major Subdivisions and/or Rezoning

Expansion of the Scott AFB mission and MidAmerica St. Louis expands air operations, will result in additional economic activity and therefore regional growth. The continued viability of the base and Airport is dependant on compatible development and a cooperative nearby landowners. Avigation and noise easements are sound legal devices created to protect against lawsuits.

Local jurisdictions are increasingly relying on avigation and noise easement to protect airfields as well as inform property owners of potential operational impacts. Sample easements are provided in the Appendix.

8. Adopt Real-Estate Disclosure Policy for Properties in The JLUS Planning Areas

Notifying potential renters and buyers of a property's proximity to Scott AFB or MidAmerica St. Louis Airport at the earliest possible point in the transaction will protect military and civilian aircraft operations as the residential population expands. Having a real estate disclosure ordinance/resolution in place educates individuals about the potential hazards and nuisances of nearby aircraft operations and encourages sound decisions about property investment around military uses.

Local governments should implement this tool by adopting a local real estate disclosure ordinance. To ensure the full and effective release of information, jurisdictions requiring disclosure should work with the local real estate community to develop standard language on noise and other possible operational impacts. A sample disclosure is included in the Appendix.

9. Build Regional Capacity

Establish ongoing mechanisms to ensure consistent coordinated and regionally based decision-making even with a change in decision-makers. One method to ensure long-term consistent decision making is to continue Working Group meetings on a bi-annual basis to review compatibility issues and JLUS recommendation implementation by local jurisdictions.

Other methods of communication and coordination include signing Memoranda of Understanding (MOU) with Scott AFB and Joint Boundary Agreements between neighboring communities. MOUs, though not binding, are good-faith agreements which formalize procedures of communication between governmental bodies. Joint Boundary Agreements also establish coordination efforts between governmental jurisdictions and can

place emphasis on compatible development around Scott AFB and Airport. A sample MOU is included in the Appendix.

10. Continue to Improve Overall Communication and Coordination

Under this approach, participating jurisdictions would ensure that residents, developers, businesses, and local decision-makers have adequate information about Air Force and Airport operations, possible impacts on lands surrounding Scott AFB and MidAmerica St. Louis Airport, procedures to submit comments, and any additional local measures to promote land use compatibility around the installations.

Governments should use all available media, including posters, brochures, and city and county web sites to convey the information. Website data should also include maps of properties within the designated noise, safety and planning buffers. Ideally, land owners, developers, and prospective renters or buyers could access a searchable database of properties in these areas.

Action Steps by Partner

The following section organizes recommended action steps by regional partner. Implementation steps are categorized as either Near Term, to be implemented in the next 3 years, and Long Term, to be implemented after 3 years.

St. Clair County

Scott AFB/ MidAmerica St. Louis Airport Joint Land Use Study Implementation Strategy Matrix		Implementation Partners	Timeframe
ST. CLAIR COUNTY			
<i>REGIONAL ADVISORY BOARD</i>			
OBJECTIVE:	<i>Establish procedure for regional review of development applications that have received an 'incompatible' finding from Scott AFB</i>		
Action 1:	Locally ratify the creation of the Regional Advisory Board, whose purpose is to review development application found to be incompatible by Scott AFB. Partners should draft a policy together which includes these universal standards: <ul style="list-style-type: none"> • who is represented on the Board; • what development applications and planning documents, at a minimum, shall be sent to Scott AFB for review; • which properties are subject to review by Scott AFB and the Regional Advisory Board; • a timeline and process for review; and • requirements for approval of an application that has been found to be incompatible by the Regional Advisory Board 	St. Clair County, Scott AFB, Airport, O'Fallon, Mascoutah, and Shiloh	Near Term
Action 2:	St. Clair County should consider adopting a provision that requires a super-majority vote by the County Commission to approve a development application that has been found to be incompatible by the Regional Advisory Board	St. Clair County Commission	Near Term
Action 3:	Work with partners to expand the review authority boundaries of the Regional Advisory Board to include, at a minimum, the Planning Influence area.	St. Clair County, Scott AFB, Airport, Lebanon, O'Fallon, Mascoutah, and Shiloh	Long Term
<i>PLANNING & PUBLIC POLICY</i>			
OBJECTIVE:	<i>Establish official community support for compatible land use planning near Scott AFB and MidAmerica St. Louis Airport</i>		
Action 1:	Update Comprehensive Plan to include language about JLUS coordination and desire to promote compatible land use planning. Include map of the JLUS planning areas, noise contours and Accident Potential Zones.	Building and Zoning Department	Near Term

Scott AFB/ MidAmerica St. Louis Airport Joint Land Use Study Implementation Strategy Matrix ST. CLAIR COUNTY		Implementation Partners	Timeframe
<i>PLANNING & PUBLIC POLICY, continued</i>			
Action 2:	Update Comprehensive Plan with a future land use plan that meets compatibility standards enumerated in the JLUS recommendations.	Building and Zoning Department	Near Term
Action 3:	Link Short Term Work Program and other infrastructure plans, such as roads, to the Comprehensive Plan. Future infrastructure extensions and service areas, along with planned road widenings and new roads, should be located to promote compatible land use development.	St. Clair County Highway Department, Building and Zoning Department, and Illinois-American Water Corporation	Near Term
<i>CODES</i>			
<i>OBJECTIVE:</i>	<i>Update existing building and zoning codes to provide compatible development and protect public welfare near Scott AFB and MidAmerica St. Louis Airport</i>		
Action 1:	Update existing Airport Overlay code (Sec. 40-4) to tie to most recent noise contours. In addition, provide clarification on prohibited uses by condensing lists into one overall list. Consider revising entire O-3 code to include JLUS recommendations.	St. Clair County Building and Zoning Department	Near Term
Action 2:	Revise existing Airport Overlay code (Sec. 40-4) to include JLUS recommendations. Include separate subareas for military Accident Potential Zones and noise contours from both runways.	St. Clair County Building and Zoning Department	Near Term
Action 3:	Adopt additional sound attenuation standards for new residential construction within the noise contours around Scott AFB and the Airport	St. Clair County Building and Zoning Department	Near Term
Action 4:	Adopt a height restriction ordinance around Scott AFB and MidAmerica St. Louis Airport limiting towers and structures to 100 feet outside the Approach and Departure Area, and meeting the FAA Part 77 Imaginary Surface heights within the Approach and Departure Area. (Sec. 40-1-14)	St. Clair County Building and Zoning Department	Near Term

Scott AFB/ MidAmerica St. Louis Airport Joint Land Use Study Implementation Strategy Matrix ST. CLAIR COUNTY		Implementation Partners	Timeframe
<i>CODES, continued</i>			
Action 5:	Adopt a Planned Unit Development ordinance or other flexible development ordinance that allows for clustering development without increasing the net density. The new code should be applicable to any property, including those affected by noise contours and Accident Potential Zones.	St. Clair County Building and Zoning Department	Long Term
Action 6:	Adopt a lighting ordinance with special protection against ambient light around Scott AFB and the Airport. (Update Sec. 40-4-110)	St. Clair County Building and Zoning Department	Long Term
<i>EASEMENTS</i>			
<i>OBJECTIVE:</i>	<i>Enable the requiring of easements on properties around Scott AFB and the Airport to limit future lawsuits and protect the existing and future military mission of Scott AFB</i>		
Action 1:	Adopt a policy or ordinance requiring all new major subdivisions and rezonings around Scott AFB and MidAmerica St. Louis Airport to grant noise easements that allow the continuance of aircraft operations.	St. Clair County Commission and the Building and Zoning Department	Near Term
Action 2:	Adopt a policy or ordinance enabling the ability to require aviation easements from major subdivisions and rezonings around Scott AFB and MidAmerica St. Louis Airport	St. Clair County Commission and the Building and Zoning Department	Long Term
<i>DISCLOSURE</i>			
<i>OBJECTIVE:</i>	<i>Provide future residents and land owners with accurate information concerning military training and aviation impacts on properties near Scott AFB and MidAmerica St. Louis Airport</i>		
Action 1:	Adopt ordinance requiring disclosure of property proximity to Scott AFB and the Airport to prospective buyers and renters. Work with the local real estate community to provide an acceptable notification document and standard language	St. Clair County Commission, the Building and Zoning Department, and real-estate builders representatives	Near Term

Scott AFB/ MidAmerica St. Louis Airport Joint Land Use Study Implementation Strategy Matrix ST. CLAIR COUNTY		Implementation Partners	Timeframe
COORDINATION			
OBJECTIVE:	<i>Coordinate land planning and development activities with Scott AFB to ensure compatible development around the installation</i>		
Action 1:	Enter into a Memorandum of Understanding with Scott AFB itemizing coordination effort for land use planning and development application reviews around the installation	St. Clair County Commission, Scott AFB	Near Term
OBJECTIVE:	<i>Coordinate land planning and annexation activities with neighboring communities to ensure compatible development around Scott AFB and MidAmerica St. Louis Airport</i>		
Action 1:	Enter into a Joint Boundary Agreement with each of the local municipalities around Scott AFB. The Agreements should discuss future annexation boundaries and land use plans for properties in proximity to the military installation and civilian airport.	St. Clair County, Lebanon, O'Fallon, Mascoutah, and Shiloh	Long Term
OBJECTIVE:	<i>Ensure that School planning and site locations meet JLUS recommendations.</i>		
Action 1:	Coordinate closely with the School Board on planning activities in the community and site location of new schools. Consider appointing a representative from the School Board on the Planning Commission.	St. Clair County School Board and St. Clair County Commission	Near Term
COMMUNICATION & EDUCATION			
OBJECTIVE:	<i>Provide residents, developers and the general public with information regarding noise and safety impacts related to aircraft operations around Scott AFB and the Airport</i>		
Action 1:	Post maps on the County website of the current noise contours and the Accident Potential Zones. Include major roads and parcels on the map. Post this map at the Building and Zoning permit desk as well.	St. Clair Building and Zoning Department, and the Mapping and Platting Department	Near Term
Action 2:	Post the 3-D Imaginary Airspace model on the County website.	St. Clair Building and Zoning Department, and GIS Department	Near Term
Action 3:	Create a searchable database of properties affected by the noise contours and Accident Potential Zones. Post the database tool on the County website.	St. Clair Building and Zoning Department, and the Mapping and Platting Department	Long Term

Village of Shiloh

Scott AFB/ MidAmerica St. Louis Airport Joint Land Use Study Implementation Strategy Matrix VILLAGE OF SHILOH		Implementation Partners	Timeframe
REGIONAL ADVISORY BOARD			
OBJECTIVE:	<i>Establish procedure for regional review of development applications that have received an 'incompatible' finding from Scott AFB</i>		
Action 1:	Locally ratify the creation of the Regional Advisory Board, whose purpose is to review development application found to be incompatible by Scott AFB. Partners should draft a policy together which includes these universal standards: <ul style="list-style-type: none"> • who is represented on the Board; • what development applications and planning documents, at a minimum, shall be sent to Scott AFB for review; • which properties are subject to review by Scott AFB and the Regional Advisory Board; • a timeline and process for review; and • requirements for approval of an application that has been found to be incompatible by the Regional Advisory Board 	Village of Shiloh, Scott AFB, Airport, O'Fallon, Mascoutah, and St. Clair County	Near Term
Action 2:	The Village should consider adopting a provision that requires a super-majority vote to approve a development application that has been found to be incompatible by the Regional Advisory Board	Village of Shiloh Board of Trustees	Near Term
Action 3:	Work with partners to expand the review authority boundaries of the Regional Advisory Board to include, at a minimum, the Planning Influence area.	Village of Shiloh, Scott AFB, Airport, O'Fallon, Mascoutah, and St. Clair County	Long Term
PLANNING & PUBLIC POLICY			
OBJECTIVE:	<i>Establish official community support for compatible land use planning near Scott AFB and MidAmerica St. Louis Airport</i>		
Action 1:	Update Comprehensive Plan to include language about JLUS coordination and desire to promote compatible land use planning. Include map of the JLUS planning areas, noise contours and Accident Potential Zones.	Engineering Department	Near Term

Scott AFB/ MidAmerica St. Louis Airport Joint Land Use Study Implementation Strategy Matrix VILLAGE OF SHILOH		Implementation Partners	Timeframe
<i>PLANNING & PUBLIC POLICY, continued</i>			
Action 2:	Update Comprehensive Plan with a future land use plan that meets compatibility standards enumerated in the JLUS recommendations, especially along IL-158 and Maple Street	Engineering Department	Near Term
Action 3:	Link Short Term Work Program and other infrastructure plans, such as roads, to the Comprehensive Plan. Future infrastructure extensions and service areas, along with planned road widenings and new roads, should be located to promote compatible land use development.	Village Engineering Department, St. Clair County Highway Department, and Illinois-American Water Corporation	Near Term
Action 4:	Consider adopting a policy to update the Villages' Comprehensive Plan on a regular basis, preferably every 5 years.	Engineering Department	Long Term
<i>CODES</i>			
<i>OBJECTIVE:</i>	<i>Update existing building and zoning codes to provide compatible development and protect public welfare near Scott AFB and MidAmerica St. Louis Airport</i>		
Action 1:	Update existing Scott Airport Overlay code to tie to most recent noise contours. (Sec. 6.4.07.01) Add reference to safety zones (APZ and Clear Zones). Consider revising code to include JLUS recommendations and planning areas.	Engineering Department	Near Term
Action 2:	Revise existing Airport Overlay code to include JLUS recommendations. Include separate subareas for military Accident Potential Zones and noise contours from both runways. (Sec. 6.4.07)	Engineering Department	Near Term
Action 3:	Adopt additional sound attenuation standards for new residential construction within the noise contours around Scott AFB and the Airport. (Sec. 6.4.07.05 and 6.4.07.06)	Engineering Department	Near Term
Action 4:	Adopt a height restriction ordinance around Scott AFB and MidAmerica St. Louis Airport limiting towers and structures to 100 feet. (Sec. 6.4.07.08)	Engineering Department	Near Term
Action 5:	Update lighting ordinance with protection against ambient light around Scott AFB and the Airport. (Sec. 6.7.22)	Engineering Department	Long Term

Scott AFB/ MidAmerica St. Louis Airport Joint Land Use Study Implementation Strategy Matrix VILLAGE OF SHILOH		Implementation Partners	Timeframe
EASEMENTS			
OBJECTIVE:	<i>Enable the requiring of easements on properties around Scott AFB and the Airport to limit future lawsuits and protect the existing and future military mission of Scott AFB</i>		
Action 1:	Adopt a policy or ordinance requiring all new major subdivisions and rezonings around Scott AFB and MidAmerica St. Louis Airport to grant noise easements that allow the continuance of aircraft operations.	Village Board of Trsutees and Engineering Department	Near Term
Action 2:	Adopt a policy or ordinance enabling the ability to require avigation easements from major subdivisions and rezonings around Scott AFB and MidAmerica St. Louis Airport.	Village Board of Trsutees and Engineering Department	Long Term
DISCLOSURE			
OBJECTIVE:	<i>Provide future residents and land owners with accurate information concerning military training and aviation impacts on properties near Scott AFB and MidAmerica St. Louis Airport</i>		
Action 1:	Adopt ordinance requiring disclosure of property proximity to Scott AFB and the Airport to prospective buyers and renters. Work with the local real estate community to provide an acceptable notification document and standard language	Village Board of Trustees, the Engineering Department, real-estate builders representatives, and surrounding communities	Near Term
COORDINATION			
OBJECTIVE:	<i>Coordinate land planning and development activities with Scott AFB to ensure compatible development around the installation</i>		
Action 1:	Enter into a Memorandum of Understanding with Scott AFB itemizing coordination effort for land use planning and development application reviews around the installation.	Village of Shiloh Board of Trustees and Scott AFB	Near Term

Scott AFB/ MidAmerica St. Louis Airport Joint Land Use Study Implementation Strategy Matrix VILLAGE OF SHILOH		Implementation Partners	Timeframe
<i>COORDINATION, continued</i>			
OBJECTIVE:	<i>Coordinate land planning and annexation activities with neighboring communities to ensure compatible development around Scott AFB and MidAmerica St. Louis Airport</i>		
Action 1:	Enter into a Joint Boundary Agreement with the cities of O'Fallon and Mascoutah and St. Clair County . The Agreements should discuss future annexation boundaries and land use plans for properties in proximity to the military installation and civilian airport.	Village of Shiloh, O'Fallon, Mascoutah, and St. Clair County	Long Term
<i>COMMUNICATION & EDUCATION</i>			
OBJECTIVE:	<i>Provide residents, developers and the general public with information regarding noise and safety impacts related to aircraft operations around Scott AFB and the Airport</i>		
Action 1:	Post maps on the Village website of the current noise contours and the Accident Potential Zones. Include major roads and parcels on the map. Post this map at the Village Hall permit desk as well.	Engineering Department	Near Term
Action 2:	Provide a link to the 3-D Imaginary Airspace model on the St. Clair County website.	Engineering Department	Near Term
Action 3:	Provide a link to the St. Clair County website searchable database of properties affected by the noise contours and Accident Potential Zones.	Engineering Department	Long Term

City of O'Fallon

The JLUS recommends that the City of O'Fallon regulate land use in the vicinity of MidAmerica Airport through the use of the planning areas identified as part of this study, rather than the use of air safety zones established specifically for military activities. The Planning Influence Area and associated policy actions in combination with existing Federal Aviation Administration regulations, Airport Noise Compatibility Planning (14 CFR Part 150) guidelines, and plans for compatible aviation-related commercial uses will provide adequate protection for current and foreseeable airport operations without imposing military-based standards.

Scott AFB/ MidAmerica St. Louis Airport Joint Land Use Study Implementation Strategy Matrix CITY OF O'FALLON		Implementation Partners	Timeframe
REGIONAL ADVISORY BOARD			
OBJECTIVE:	<i>Establish procedure for regional review of development applications that have received an 'incompatible' finding from Scott AFB</i>		
Action 1:	Locally ratify the creation of the Regional Advisory Board, whose purpose is to review development application found to be incompatible by Scott AFB. Partners should draft a policy together which includes these universal standards: <ul style="list-style-type: none"> • who is represented on the Board; • what development applications and planning documents, at a minimum, shall be sent to Scott AFB for review; • which properties are subject to review by Scott AFB and the Regional Advisory Board; • a timeline and process for review; and • requirements for approval of an application that has been found to be incompatible by the Regional Advisory Board. 	O'Fallon, Scott AFB, Airport, Mascoutah, Shiloh, and St. Clair County,	Near Term
Action 2:	O'Fallon should consider adopting a provision that requires a super-majority vote by the City Council to approve a development application that has been found to be incompatible by the Regional Advisory Board.	O'Fallon City Council	Near Term
Action 3:	Work with partners to expand the review authority boundaries of the Regional Advisory Board to include, at a minimum, the Planning Influence area.	O'Fallon, Scott AFB, Airport, Mascoutah, Shiloh, and St. Clair County,	Long Term
PLANNING & PUBLIC POLICY			
Action 1:	Link Short Term Work Program and other infrastructure plans, such as roads, to the Comprehensive Plan. Future infrastructure extensions and service areas, along with planned road widenings and new roads, should be located to promote compatible land use development.	O'Fallon Public Works, Planning and Zoning, St. Clair County Highway Department, and Illinois-American Water Corporation	Near Term

Scott AFB/ MidAmerica St. Louis Airport Joint Land Use Study Implementation Strategy Matrix CITY OF O'FALLON		Implementation Partners	Timeframe
CODES			
OBJECTIVE:	<i>Update existing building and zoning codes to provide compatible development and protect public welfare near Scott AFB and MidAmerica St. Louis Airport</i>		
Action 1:	Revise existing Airport Environs Overlay code to include JLUS recommendations. Include separate subareas for Accident Potential Zones and noise contours from both runways. Address bird strike hazards in text definition or in engineering guidelines for stormwater retention ponds.	O'Fallon Planning and Zoning Department	Near Term
Action 2:	Adopt additional sound attenuation standards for new residential construction within the noise contours around Scott AFB and the Airport.	O'Fallon Planning and Zoning Department	Near Term
Action 3:	Adopt additional height restrictions around Scott AFB and MidAmerica St. Louis Airport limiting towers and structures to 100 feet. (Sec. 6.070)	O'Fallon Planning and Zoning Department	Near Term
Action 4:	Adopt a lighting ordinance with special protection against ambient light around Scott AFB and the Airport. (Sec.6.050 and Sec. 11.090)	O'Fallon Planning and Zoning Department	Long Term
EASEMENTS			
OBJECTIVE:	<i>Enable the requiring of easements on properties around Scott AFB and the Airport to limit future lawsuits and protect the existing and future military mission of Scott AFB</i>		
Action 1:	Adopt a policy or ordinance enabling the ability to require all new major subdivisions and rezonings around Scott AFB and MidAmerica St. Louis Airport to grant noise easements that allow the continuance of aircraft operations.	O'Fallon City Council and Planning and Zoning Department	Near Term
Action 2:	Adopt a policy or ordinance requiring aviation easements from major subdivisions and rezonings around Scott AFB and MidAmerica St. Louis Airport (Sec. 6.120)	O'Fallon City Council and Planning and Zoning Department	Long Term

Scott AFB/ MidAmerica St. Louis Airport Joint Land Use Study Implementation Strategy Matrix CITY OF O'FALLON		Implementation Partners	Timeframe
DISCLOSURE			
OBJECTIVE:	<i>Provide future residents and land owners with accurate information concerning military training and aviation impacts on properties near Scott AFB and MidAmerica St. Louis Airport</i>		
Action 1:	Adopt ordinance requiring disclosure of property proximity to Scott AFB and the Airport to prospective buyers and renters. Work with the local real estate community to provide an acceptable notification document and standard language	O'Fallon City Council, Planning and Zoning Department, real-estate builders representatives, and surrounding communities	Near Term
COORDINATION			
OBJECTIVE:	<i>Coordinate land planning and development activities with Scott AFB to ensure compatible development around the installation</i>		
Action 1:	Enter into a Memorandum of Understanding with Scott AFB itemizing coordination effort for land use planning and development application reviews around the installation	O'Fallon City Council	Near Term
OBJECTIVE:	<i>Coordinate land planning and annexation activities with neighboring communities to ensure compatible development around Scott AFB and MidAmerica St. Louis Airport</i>		
Action 1:	Enter into a Joint Boundary Agreement with the Village of Shiloh, St. Clair County and Lebanon. The Agreements should discuss future annexation boundaries and land use plans for properties in proximity to the military installation and civilian airport.	O'Fallon, St. Clair County, Lebanon, and Shiloh	Long Term
OBJECTIVE:	<i>Ensure that School planning and site locations meet JLUS recommendations.</i>		
Action 1:	Coordinate closely with the School Board on planning activities in the community and site location of new schools. Consider appointing a representative from the School Board on the Planning Commission.	O'Fallon City Council, Planning and Zoning, and St. Clair County School Board	Near Term

Scott AFB/ MidAmerica St. Louis Airport Joint Land Use Study Implementation Strategy Matrix CITY OF O'FALLON		Implementation Partners	Timeframe
<i>COMMUNICATION & EDUCATION</i>			
<i>OBJECTIVE:</i>	<i>Provide residents, developers and the general public with information regarding noise and safety impacts related to aircraft operations around Scott AFB and the Airport</i>		
Action 1:	Post maps on the City website of the current noise contours and the Accident Potential Zones. Include major roads and parcels on the map. Post this map at the permit desk as well.	O'Fallon Planning and Zoning Department	Near Term
Action 2:	Provide a link to the 3-D Imaginary Airspace model on the St. Clair County website.	Planning and Zoning Department	Near Term
Action 3:	Provide a link to the St. Clair County website searchable database of properties affected by the noise contours and Accident Potential Zones.	Planning and Zoning Department	Long Term

City of Mascoutah

Scott AFB/ MidAmerica St. Louis Airport Joint Land Use Study Implementation Strategy Matrix CITY OF MASCOUTAH		Implementation Partners	Timeframe
REGIONAL ADVISORY BOARD			
OBJECTIVE:	<i>Establish procedure for regional review of development applications that have received an 'incompatible' finding from Scott AFB</i>		
Action 1:	Locally ratify the creation of the Regional Advisory Board, whose purpose is to review development application found to be incompatible by Scott AFB. Partners should draft a policy together which includes these universal standards: <ul style="list-style-type: none"> • who is represented on the Board; • what development applications and planning documents, at a minimum, shall be sent to Scott AFB for review; • which properties are subject to review by Scott AFB and the Regional Advisory Board; • a timeline and process for review; and • requirements for approval of an application that has been found to be incompatible by the Regional Advisory Board 	Mascoutah, Scott AFB, Airport, O'Fallon, St. Clair County, and Shiloh	Near Term
Action 2:	Mascoutah should consider adopting a provision that requires a super-majority vote by the County Commission to approve a development application that has been found to be incompatible by the Regional Advisory Board	Mascoutah City Council	Near Term
Action 3:	Work with partners to expand the review authority boundaries of the Regional Advisory Board to include, at a minimum, the Planning Influence area.	Mascoutah, Scott AFB, Airport, Lebanon, O'Fallon, St. Clair County, and Shiloh	Long Term

Scott AFB/ MidAmerica St. Louis Airport Joint Land Use Study Implementation Strategy Matrix CITY OF MASCOUTAH		Implementation Partners	Timeframe
PLANNING & PUBLIC POLICY			
OBJECTIVE:	<i>Establish official community support for compatible land use planning near Scott AFB and MidAmerica St. Louis Airport</i>		
Action 1:	Link Short Term Work Program and other infrastructure plans, such as roads, to the Comprehensive Plan. Future infrastructure extensions and service areas, along with planned road widenings and new roads, should be located to promote compatible land use development.	Economic Development Department, St. Clair County Highway Department, and Summerfield-Lebanon-Mascoutah Water Commission	Near Term
CODES			
OBJECTIVE:	<i>Update existing building and zoning codes to provide compatible development and protect public welfare near Scott AFB and MidAmerica St. Louis Airport</i>		
Action 2:	Revise existing Airport Overlay District to include JLUS recommendations. Include separate subareas for military Accident Potential Zones and noise contours from both runways. (Sec. 34-6-5)	Mascoutah Economic Development Department	Near Term
Action 3:	Adopt additional sound attenuation standards for new residential construction within the noise contours around Scott AFB and the Airport (Sec. 34-6-7)	Mascoutah Economic Development Department	Near Term
Action 4:	Adopt a height restriction ordinance around Scott AFB and MidAmerica St. Louis Airport limiting towers and structures to 100 feet outside the Approach and Departure Area. Maintain existing limits based on FAA Imaginary Surfaces (Sec. 34-6-9)	Mascoutah Economic Development Department	Near Term
Action 5:	Encourage Planned Development Process where possible.	Mascoutah Economic Development Department	Long Term
Action 6:	Adopt a lighting ordinance with special protection against ambient light around Scott AFB and the Airport. (Sec. 34-6-6)	Mascoutah Economic Development Department	Long Term

Scott AFB/ MidAmerica St. Louis Airport Joint Land Use Study Implementation Strategy Matrix CITY OF MASCOUTAH		Implementation Partners	Timeframe
EASEMENTS			
OBJECTIVE:	<i>Enable the requiring of easements on properties around Scott AFB and the Airport to limit future lawsuits and protect the existing and future military mission of Scott AFB</i>		
Action 1:	Adopt a policy or ordinance enabling the ability to require all new major subdivisions and rezonings around Scott AFB and MidAmerica St. Louis Airport to grant noise easements that allow the continuance of aircraft operations.	Mascoutah Economic Development Department and City Council	Near Term
Action 2:	Adopt a policy or ordinance requiring aviation easements from major subdivisions and rezonings around Scott AFB and MidAmerica St. Louis Airport (Sec. 34-6-14)	Mascoutah Economic Development Department and City Council	Long Term
DISCLOSURE			
OBJECTIVE:	<i>Provide future residents and land owners with accurate information concerning military training and aviation impacts on properties near Scott AFB and MidAmerica St. Louis Airport</i>		
Action 1:	Adopt ordinance requiring disclosure of property proximity to Scott AFB and the Airport to prospective buyers and renters. Work with the local real estate community to provide an acceptable notification document and standard language	Mascoutah City Council, the Economic Development Department, real-estate builders representatives, and surrounding communities	Near Term
COORDINATION			
OBJECTIVE:	<i>Coordinate land planning and development activities with Scott AFB to ensure compatible development around the installation</i>		
Action 1:	Enter into a Memorandum of Understanding with Scott AFB itemizing coordination effort for land use planning and development application reviews around the installation	Mascoutah City Council, Scott AFB	Near Term

Scott AFB/ MidAmerica St. Louis Airport Joint Land Use Study Implementation Strategy Matrix CITY OF MASCOUTAH		Implementation Partners	Timeframe
<i>COORDINATION, continued</i>			
OBJECTIVE:	<i>Coordinate land planning and annexation activities with neighboring communities to ensure compatible development around Scott AFB and MidAmerica St. Louis Airport</i>		
Action 1:	Enter into a Joint Boundary Agreement with Lebanon, St. Clair County, and the Village of Shiloh. The Agreements should discuss future annexation boundaries and land use plans for properties in proximity to the military installation and civilian airport.	Mascoutah, St. Clair County, Lebanon, and Shiloh	Long Term
<i>COMMUNICATION & EDUCATION</i>			
OBJECTIVE:	<i>Provide residents, developers and the general public with information regarding noise and safety impacts related to aircraft operations around Scott AFB and the Airport</i>		
Action 1:	Post maps on the City website of the current noise contours and the Accident Potential Zones. Include major roads and parcels on the map. Post this map at the permit desk as well.	Mascoutah Economic Development Department and City Council	Near Term
Action 2:	Provide a link to the 3-D Imaginary Airspace model on the St. Clair County website.	Mascoutah Economic Development Department and City Council	Near Term
Action 3:	Provide a link to the St. Clair County website searchable database of properties affected by the noise contours and Accident Potential Zones.	Mascoutah Economic Development Department and City Council	Long Term

3



Appendix

Scott Air Force Base
MidAmerica St. Louis Airport
Joint Land Use Study

In an effort to conserve paper, this document is formatted to be printed double sided

List of Acronyms

AFB	Air Force Base
AICUZ	Air Installation Compatible Use Zone
APZ	Accident Potential Zone
BRAC	Base Alignment and Closure
CZ	Clear Zone
dB	Decibels
dba	A-weighted decibels
DoD	Department of Defense
DNL	Day-night sound level
DU	Dwelling Unit
FAA	Federal Aviation Administration
FICUN	Federal Interagency Committee on Urban Noise
IDOT	Illinois Department of Transportation
JLUS	Joint Land Use Study
LUPZ	Land Use Planning Zone
MOU	Memorandum of Understanding
NVG	Night Vision Goggle
OEA	Office of Economic Adjustment
PAO	Public Affairs Office
REPI	Readiness and Environmental Protection Initiative
RPZ	Runway Protection Zone

Glossary

A-weighting (dBA) - A measure of sound that depicts higher frequency noise caused by small arms firing, aircraft use, and vehicle operations.

Accident Potential Zone I (APZ I) [Class A Runway Accident] - An area just beyond the Clear Zones at each end of the runway. Less critical than the Clear Zone it still possesses significant potential for accidents. Land use compatibility guidelines allow a wide variety of industrial, manufacturing, transportation, communication, utilities, wholesale trade, open space, recreation and agricultural uses. Uses that concentrate people in small areas are not acceptable in APZ I.

Accident Potential Zone II (APZ II) [Class A Runway] - An area extending beyond APZ I. This area is less critical than APZ I but still possesses potential for accidents. Acceptable land uses include those in APZ I, as well as low density, single family residences. Also acceptable are personal and business services and commercial retail trade uses of low intensity or scale of operation. High-density functions such as multi-story buildings, places of assembly (e.g., theaters, schools, churches, and restaurants) and high-density office uses are not considered appropriate.

Army Compatible Use Buffer (ACUB) - A new program allows military installations to provide funds to a partner who, in turn, would purchase title or conservation easements on tracts of land that surround the installation to buffer the installation from further development. Partners may include states, cities and counties as well as not-for-profit, non-governmental conservation organizations.

Clear Zone (CZ) [Class A Runway] - An area 1,000 feet wide by 3,000 feet long located at the immediate end of the runway. The accident potential in this area is so high that no building is allowed.

Day-Night Average Sound Level (DNL) - The 24-hour average frequency-weighted sound level, in decibels, from midnight to midnight, obtained after addition of 10 decibels to sound levels in the night from midnight up to 7 a.m. and from 10 p.m. to midnight (0000 up to 0700 and 2200 up to 2400 hours).

Decibels (dB) - The decibel is a logarithmic unit of measure of sound pressure.

Land Use Planning Zone. The noise contours, 65 ADNL and 62CDNL, represent an annual average that separates the Noise Zone II, which has compatibility issues, from the fully compatible NZ I. Since the noise environment at the installation varies daily and seasonally, the Land Use Planning Zone (LUPZ) contour more broadly encompasses off-post lands, where on particularly active days, noise and the resulting community annoyance can approach levels typically associated with NZ II. The LUPZ, thus, gives the installation more flexibility for performing its mission and better reflects actual noise conditions during a period of heightened activity.

Noise Zone I. Noise Zone I (NZ I) includes areas around a noise source in which the DNL is less than 65 dBA and less than 62 dBC. Since the noise exposure in this zone is low enough that it does not trigger compatibility with sensitive uses, maps of the noise environment do not show NZ I contours.

Noise Zone II. Noise Zone II (NZ II) consists of an area where the A-weighted DNL is between 65 and 75 decibels and the C-weighted DNL is between 62 and 70 decibels. Guidance deems noise exposure within this area to be significant and recommends limiting use of land to non-

sensitive activities such as industry, manufacturing, transportation, and agriculture. However, if the community determines that land in NZ II areas must be used for residential purposes, guidance suggests that the design and construction of the buildings incorporate noise level reduction (NLR) features to minimize the annoyance experienced by residents.

Noise Zone III. Noise Zone III (NZ III) consists of the immediate areas around the source of the noise in which the A-weighted DNL (ADNL) is more than 75 decibels, and the C-weighted DNL (CDNL) exceeds 70 decibels. Guidance indicates that noise in this zone is severe enough to cause conflicts with almost all activities, particularly sensitive land uses, such as housing, schools, medical facilities, and places of worship.

GUIDELINES FOR CONSIDERING NOISE IN LAND USE PLANNING AND CONTROL. (FICUN 1980)

	NZ I		NZ II			NZ III	
	0-55	55-65	65-70	70-75	75-80	80-85	85+
RESIDENTIAL							
HOUSEHOLD UNITS	YES	YES ⁺	25 ¹	30 ¹	NO	NO	NO
GROUP QUARTERS	YES	YES ⁺	25 ¹	30 ¹	NO	NO	NO
RESIDENTIAL HOTELS	YES	YES ⁺	25 ¹	30 ¹	NO	NO	NO
MANUFACTURED HOUSING	YES	YES ⁺	NO	NO	NO	NO	NO
OTHER RESIDENTIAL	YES	YES ⁺	25 ¹	30 ¹	NO	NO	NO
MANUFACTURING							
FOOD PRODUCTS	YES	YES	YES	YES ²	YES ³	YES ⁴	NO
TEXTILE MILL PRODUCTS	YES	YES	YES	YES ²	YES ³	YES ⁴	NO
APPAREL	YES	YES	YES	YES ²	YES ³	YES ⁴	NO
WOOD PRODUCTS	YES	YES	YES	YES ²	YES ³	YES ⁴	NO
FURNITURE	YES	YES	YES	YES ²	YES ³	YES ⁴	NO
PAPER	YES	YES	YES	YES ²	YES ³	YES ⁴	NO
PRINTING	YES	YES	YES	YES ²	YES ³	YES ⁴	NO
MANUFACTURING	YES	YES	YES	YES ²	YES ³	YES ⁴	NO
TRANSPORT, COMMS & UTIL							
RAILROAD	YES	YES	YES	YES ²	YES ³	YES ⁴	YES ⁴
MOTOR VEHICLE	YES	YES	YES	YES ²	YES ³	YES ⁴	YES ⁴
AIRCRAFT	YES	YES	YES	YES ²	YES ³	YES ⁴	YES ⁴
MARINE CRAFT	YES	YES	YES	YES ²	YES ³	YES ⁴	YES ⁴
HIGHWAY & STREET	YES	YES	YES	YES ²	YES ³	YES ⁴	YES ⁴
PARKING	YES	YES	YES	YES ²	YES ³	YES ⁴	NO
COMMUNICATIONS	YES	YES	YES	25 ⁵	30 ⁵	NO	NO

UTILITIES	YES	YES	YES	YES ²	YES ³	YES ⁴	YES ⁴
OTHER T, C & U	YES	YES	YES	25 ⁵	30 ⁵	NO	NO
TRADE							
WHOLESALE TRADE	YES	YES	YES	YES ²	YES ³	YES ⁴	NO
RETAIL - BUILDING	YES	YES	YES	YES ²	YES ³	YES ⁴	NO
RETAIL - GENERAL	YES	YES	YES	25	30	NO	NO
RETAIL - FOOD	YES	YES	YES	25	30	NO	NO
RETAIL - AUTO	YES	YES	YES	25	30	NO	NO
RETAIL - APPAREL	YES	YES	YES	25	30	NO	NO
RETAIL - FURNITURE	YES	YES	YES	25	30	NO	NO
RETAIL - EATING	YES	YES	YES	25	30	NO	NO
OTHER RETAIL TRADE	YES	YES	YES	25	30	NO	NO
SERVICES							
FINANCE, INSURANCE	YES	YES	YES	25	30	NO	NO
PERSONAL SERVICES	YES	YES	YES	25	30	NO	NO
CEMETERIES ¹¹	YES	YES	YES	YES ²	YES ³	YES ⁴	YES ⁶
REPAIR SERVICES	YES	YES	YES	YES ²	YES ³	YES ⁴	NO
PROFESS SERVICES	YES	YES	YES	25	30	NO	NO
HOSPITALS, NURSING	YES	YES [*]	25 [*]	30 [*]	NO	NO	NO
OTHER MEDICAL	YES	YES	YES	25	30	NO	NO
FACILITIES							
CONTRACT CONSTRUCTION	YES	YES	YES	25	30	NO	NO
GOVERNMENT SERVICES	YES	YES [*]	YES [*]	25 [*]	30 [*]	NO	NO
EDUCATIONAL SERVICES	YES	YES [*]	25 [*]	30 [*]	NO	NO	NO
MISC SERVICES	YES	YES	YES	25	30	NO	NO

CULTURAL, ENTERTAINMENT & RECREATION

CHURCHES	YES	YES [*]	25 [*]	30 [*]	NO	NO	NO
NATURE EXHIBITS	YES	YES [*]	YES [*]	NO	NO	NO	NO
PUBLIC ASSEMBLY	YES	YES	YES	NO	NO	NO	NO
AUDITORIUMS	YES	YES	25	30	NO	NO	NO
AMPHITHEATERS	YES	YES [*]	NO	NO	NO	NO	NO
OUTDOOR SPORTS	YES	YES	YES ⁷	YES ⁷	NO	NO	NO
AMUSEMENTS	YES	YES	YES	YES	NO	NO	NO
RECREATIONAL	YES	YES [*]	YES [*]	25 [*]	30 [*]	NO	NO
RESORTS	YES	YES [*]	YES [*]	YES [*]	NO	NO	NO
PARKS	YES	YES [*]	YES [*]	YES [*]	NO	NO	NO
OTHER	YES	YES [*]	YES [*]	YES [*]	NO	NO	NO

RESOURCE PRODUCT

AGRICULTURE	YES	YES	YES ⁸	YES ⁹	YES ¹⁰	YES ¹⁰	YES ¹⁰
LIVESTOCK	YES	YES	YES ⁸	YES ⁹	NO	NO	NO
FORESTRY	YES	YES	YES ⁸	YES ⁹	YES ¹⁰	YES ¹⁰	YES ¹⁰
FISHING	YES	YES	YES	YES	YES	YES	YES
MINING	YES	YES	YES	YES	YES	YES	YES
OTHER RESOURCE	YES	YES	YES	YES	YES	YES	YES

Legend:

Yes	Land use and related structures compatible without restrictions.
No	Land use and related structures are not compatible and should be prohibited.
ADNL	A-weighted day-night sound level
NZ	Noise Zone
Yes ^x	(Yes with restrictions) Land use and related structures generally compatible; see footnotes.
25, 30, 35	Land use and related structures generally compatible; measures to achieve noise level reduction (NLR) of 25, 30 or 35 must be incorporated into design and construction of structure.
25 [*] , 30 [*] , 35 [*]	Land use generally compatible with NLR; however, measures to achieve an overall NLR do not necessarily solve noise difficulties; additional evaluation is warranted.
NLR	Noise level reduction (outdoor to indoor) to be achieved through incorporation of noise attenuation into the design and construction of the structure.

Footnotes:

The designation of these uses as "compatible" in this zone reflects individual Federal agencies' consideration of general cost and feasibility factors as well as past community experiences and program objectives. Localities, when evaluating the application of these guidelines to specific situations, may have different concerns or goals to consider.

- 1 (a) Although local conditions may require residential use, it is discouraged in 65-70 ADNL and strongly discouraged in 70-75 ADNL. The absence of viable alternative development options should be determined and an evaluation indicating that a demonstrated community need for residential use would not be met if development were prohibited in these zones should be conducted prior to approvals.
- (b) Where the community determines that residential uses must be allowed, measures to achieve outdoor to indoor NLR of at least 25 dB (65-70 ADNL) and 30 dB (70-75 ADNL) should be incorporated into building codes and be considered in individual approvals. Normal construction can be expected to provide a NLR of 20 dB, thus the reduction requirements are often stated as 5, 10, or 15 dB over standard construction and normally assume mechanical ventilation and closed windows year round. Additional consideration should be given to modifying NLR levels based on peak noise levels.
- (c) NLR criteria will not eliminate outdoor noise problems. However, building location and site planning, design, and use of berms and barriers can help mitigate outdoor noise exposure particularly from ground level transportation sources. Measures that reduce noise at a site should be used wherever practical in preference to measures that only protect interior spaces.
- 2 Measures to achieve NLR of 25 must be incorporated into the design and construction of portions of these buildings where the public is received, office areas, noise-sensitive areas, or where the normal noise level is low.
- 3 Measures to achieve NLR of 30 must be incorporated into the design and construction of portions of these buildings where the public is received, office areas, noise-sensitive areas, or where the normal noise level is low.
- 4 Measures to achieve NLR of 35 must be incorporated into the design and construction of portions of these buildings where the public is received, office areas, noise-sensitive areas, or where the normal noise level is low.
- 5 If noise-sensitive, use indicated NLR; if not, use is compatible.
- 6 No buildings.
- 7 Land use compatible provided special sound reinforcement systems are installed.
- 8 Residential buildings require a NLR of 25.
- 9 Residential buildings require a NLR of 30.
- 10 Residential buildings not permitted.
- 11 In areas with ADNL greater than 80, land use not recommended, but if community decides use is necessary, hearing protection devices should be worn by personnel.

DoD COMPATIBLE LAND USE GUIDELINES FOR CLEAR ZONES AND ACCIDENT POTENTIAL ZONES (APZ).

(U.S. Army 1981)

LAND USE	CLEAR ZONE	APZ I	APZ II
<i>A. RESIDENTIAL</i>			
Single Family Unit	No	No	Yes ²
2-4 Family Units	No	No	No
Multifamily Dwellings (Apartments)	No	No	No
Group Quarters	No	No	No
Residential Hotels	No	No	No
Mobile Home Parks or Courts	No	No	No
Other Residential	No	No	No
<i>B. INDUSTRIAL & MANUFACTURING³</i>			
Food and Kindred Products	No	No	Yes

Apparel	No	No	No
Lumber and Wood Products	No	Yes	Yes
Furniture and Fixtures	No	Yes	Yes
Printing, Publishing	No	Yes	Yes
Miscellaneous Manufacturing	No	Yes	Yes
<i>C. TRANSPORTATION, COMMUNICATIONS & UTILITIES⁴</i>			
Railroad, Rapid Rail Transit (on-grade)	No	Yes ⁴	Yes
Highway and Street Rights-of-Way	Yes ⁵	Yes	Yes
Auto Parking	No	Yes	Yes
Communications	Yes ⁵	Yes	Yes
Utilities	Yes ⁵	Yes ⁴	Yes
Other Transportation, Communications and Utilities	Yes ⁵	Yes	Yes
<i>D. COMMERCIAL & RETAIL TRADE</i>			
Wholesale Trade	No	Yes	Yes
Building Materials (Retail)	No	Yes	Yes
General Merchandise (Retail)	No	No	Yes
Food (Retail)	No	No	Yes
Automotive, Marine, and Aviation	No	Yes	Yes
Apparel and Accessories (Retail)	No	No	Yes
Furniture, Home Furnishings (Retail)	No	No	Yes
Eating and Drinking Facilities	No	No	No
Other Retail Trade	No	No	Yes
<i>E. PERSONAL & BUSINESS SERVICES⁶</i>			
Finance, Insurance, and Real Estate	No	No	Yes
Personal Services	No	No	Yes
Business Services	No	No	Yes
Repair Services	No	Yes	Yes
Professional Services	No	No	Yes
Contract Construction Services	No	Yes	Yes
Indoor Recreation Services	No	No	Yes
Other Services	No	No	Yes
<i>F. PUBLIC AND QUASI-PUBLIC SERVICES</i>			
Government Services	No	No	Yes ⁶
Educational Services	No	No	No
Cultural Activities	No	No	No
Medical and Other Health Services	No	No	No
Cemeteries	No	Yes ⁷	Yes ⁷
Non-profit Organizations including Churches	No	No	No
Other Public and Quasi-Public Services	No	No	Yes
<i>G. OUTDOOR RECREATION</i>			
Playgrounds and Neighborhood Parks	No	No	Yes
Community and Regional Parks	No	Yes ⁸	Yes ⁸

Nature Exhibits	No	Yes	Yes
Spectator Sports Including Arenas	No	No	No
Golf Courses ⁹ , Riding Stables ¹⁰	No	Yes	Yes
Water Based Recreational Areas	No	Yes	Yes
Resort and Group Camps	No	No	No
Entertainment Assembly Areas	No	No	No
Other Outdoor Recreation	No	Yes ⁸	Yes
<i>H. RESOURCE PRODUCTION & EXTRACTION& OPEN LAND</i>			
Agriculture ¹¹	Yes	Yes	Yes
Livestock Farming, Animal Breeding ¹²	No	Yes	Yes
Forestry Activities	No	Yes	Yes
Fishing Activities and Related Services ¹³	No ¹⁴	Yes ¹³	Yes
Mining Activities	No	Yes	Yes
Permanent Open Space	Yes	Yes	Yes
Water Areas ¹³	Yes	Yes	Yes

Footnotes:

- ¹ A "Yes" or "No" designation for compatible land use is to be used only for gross comparison. Within each, uses exist where further definition may be needed as to whether it is clear or usually acceptable/unacceptable owing to variations in densities of people and structures. For heliports and stagefields, the takeoff safety zone is equivalent to the clear zone and the approach-departure zone is equivalent to APZ I for these land use guidelines.
- ² Suggested maximum density 1-2 dwelling units per acre, possibly increased under a Planned Unit Development where maximum lot coverage is less than 20 percent.
- ³ Factors to be considered: Labor intensity, structural coverage, explosive characteristics, and air pollution.
- ⁴ No passenger terminals and no major above ground transmission lines in APZ I.
- ⁵ Not permitted in graded area.
- ⁶ Low intensity office uses only. Meeting places, auditoriums, etc., not recommended.
- ⁷ Excludes chapels.
- ⁸ Facilities must be low intensity.
- ⁹ Clubhouse not recommended.
- ¹⁰ Concentrated rings with large classes not recommended.
- ¹¹ Includes livestock grazing but excludes feedlots and intensive animal husbandry.
- ¹² Includes feedlots and intensive animal husbandry.
- ¹³ Includes hunting and fishing.
- ¹⁴ Controlled hunting and fishing may be permitted for the purpose of wildlife control.

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Sample Memorandum of Understanding

Between Scott Air Force Base and

The Counties of _____ and

The Cities of _____

This Memorandum of Understanding between Scott Air Force Base, the Counties of _____, and the Cities of _____, is enacted to establish a mutually beneficial process that will ensure timely and consistent notification and cooperation between the parties on projects, policies, and activities. These parties have a mutual interest in the cooperative evaluation, review, and coordination of local plans, programs, and projects in the Counties of _____, the Cities of _____, and on Scott Air Force Base.

The Cities of _____ and the Counties of _____ agree to:

Submit information to Scott Air Force Base on plans, programs, actions, and projects that may affect Scott Air Force Base. This may include, but not be limited to the following:

- Development proposals
- Transportation improvements and plans
- Sanitary waste facilities//any infrastructure necessary to support development
- Open space and recreation
- Public works projects
- Land use plans and ordinances
- Rezonings and variances

Submit to Scott Air Force Base for review and comment, project notification, policies, plans, reports, studies and similar information on development, infrastructure and environmental activities within proximity of Scott Air Force Base as defined by _____.

Consider Air Force comments as part of local responses or reports.

Include Scott Air Force Base in the distribution of meeting agendas for, but not limited to:

- City Council or County Commission Meetings
- Planning Commission Meetings
- Zoning Boards of Adjustment
- Review Board
- Transportation Studies

Scott Air Force Base agrees to:

Submit information to City and County representatives on plans, programs, actions, and projects which may affect the city or county. These may include, but not be limited to, the following:

- Installation Master Plan
- Air Installation Compatible Use Zone Studies
- Noise Management Studies
- Changes in existing installation use that may change off-base impacts, such as noise
- Appropriate data on troop strength and activities for local plans, programs and projects

Submit to City and County representatives for review and comment, project notification, policies, plans, reports, studies and similar information on development, infrastructure and environmental activities at Scott Air Force Base.

This agreement will remain in effect until terminated by any of the parties. Amendments to this memorandum may be made by mutual agreement of all the parties. Review process details and appropriate forms may be developed to facilitate uniform and efficient exchanges of comments.

This understanding will not be construed to obligate the U.S. Air Force, the Cities of _____, the Counties of _____ to violate existing or future laws or regulations.

This agreement is approved by:

County

City

Scott Air Force Base

Sample Real Estate Disclosure

AREA OF AIRCRAFT OPERATIONAL IMPACTS REAL ESTATE DISCLOSURE FORM

Property at the following location is situated within the vicinity of Scott Air Force Base and/ or MidAmerica St. Louis Airport. The subject property may therefore be exposed to periodic low-level aircraft over-flights, aircraft noise, and impacts associated with airfield activities.

Parcel #: _____ Deed Book # _____ Page # _____

Address: _____

I, _____, (owner of the subject property) hereby certify that I have informed _____ (prospective purchaser/lessee/renter) that the subject property is located within the vicinity of Scott Air Force Base and/ or MidAmerica St. Louis Airport and may therefore be exposed to periodic low-level aircraft over-flights, aircraft noise, and impacts associated with airfield activities.

Owner/ Date

I, _____, (prospective purchaser/lessee/renter of the subject property) hereby certify that I have been informed by _____ (owner) that the subject property is located in the vicinity of Scott Air Force Base and/ or MidAmerica St. Louis Airport and may therefore be exposed to periodic low-level aircraft over-flights, aircraft noise, and impacts associated with airfield activities.

Purchaser/Lessee/Renter Date

Signed before me on this _____ day of _____, 20____, in the
County of _____, Tennessee/Kentucky

_____, Notary Public, State of Tennessee/Kentucky.

My Commission Expires on _____. (SEAL)

Sample Noise Easement

Parcel _____ County _____

Grantor (s) Name _____

Grantor (s) Address _____

LEGAL DESCRIPTION:

In accordance with section XXXXX of the Land Use Ordinance for XXXXX County, State of XXXXX, approving a permit for residential development on the above described property, and in consideration of such approval, Grantors grant to the owners of all property adjacent to the above described property, a perpetual nonexclusive easement as follows:

1. The Grantors, their heirs, successors, and assigns acknowledge by the granting of this easement that the residential development is situated in an area that may be subjected to conditions resulting from aircraft operations at Scott Air Force Base. Such conditions include the overflight of fixed-wing aircraft, the movement of vehicles, the use of generators, and other accepted and customary military training activities. These activities ordinarily and necessarily produce noise, other conditions that may conflict with Grantors' use of Grantors' property for residential purposes. Grantors hereby waive all common law rights to object to normal and necessary military training activities legally conducted on adjacent Scott Air Force Base which may conflict with Grantors' use of Grantors' property for residential and other purposes, and Grantors hereby grant an easement to the adjacent Scott Air Force Base for such activities.
2. Nothing in this easement shall grant a right to Scott Air Force Base for ingress or egress upon or across the described property. Nothing in this easement shall prohibit or otherwise restrict the Grantors from enforcing or seeking enforcement of statues or regulations of governmental agencies for activities conducted on adjacent properties.
3. This easement is appurtenant to all property adjacent to the above described property and shall bind to the heirs, successors, and assigns of Grantors and shall endure for the benefit of the adjoining Scott Air Force Base. Scott Air Force Base is hereby expressly granted the right of third party enforcement of the easement.

IN WITNESS WHEREOF, the Grantors have executed this easement dated this __ day of _____, 20__

Grantor

Grantor

Sample Lighting Zoning Ordinance #1: Dark Sky Approved Lighting

LIGHTING ORDINANCE

This ordinance is intended for use by communities anticipating the National Model Lighting Ordinance (MLO) now being developed jointly by the Illuminating Engineering Society and the International Dark Sky Association. Adaption of the MLO is recommended when available.

“Chapter xx OUTDOOR LIGHTING

xx.1. Title.

This chapter is entitled Outdoor Lighting Code of the (governing unit).

xx.2 Purpose.

The purpose of this Code is to provide regulations for outdoor lighting that will:

1. Minimize the impact of lighting on night aircraft operations;
2. Permit reasonable uses of outdoor lighting for nighttime safety, utility, security, productivity, enjoyment and commerce; and
3. Minimize discomfort and disability glare

xx.3 Applicability

1. This article is applicable to:
 - a. Installation of new lighting systems,
 - b. Modifications of existing lighting systems;
 - c. Replacement of lighting fixtures, or
 - d. Installation or replacement of any other lighting equipment, whether attached to structures, poles, the earth, or any other location, including lighting systems installed on private or public property by any third party such as an electric utility.
2. Exemption. The following luminaires and lighting systems are EXEMPT from these requirements.
 - a. Interior lighting.
 - b. Internally illuminated signs.
 - c. Externally illuminated signs.
 - d. Temporary lighting for theatrical, television, and performance areas.
 - e. Lighting in swimming pools and other water features governed by Article 680 of the National Electrical Code.
 - f. Code required exit signs.
 - g. Lighting specifically for stairs and ramps.
 - h. Temporary and seasonal lighting provided that individual lamps are 10 watts or less.
 - i. Lighting required and regulated by the Federal Aviation Administration, U.S. Coast Guard, or other federal or state agency.
 - j. Single-family and two-family dwelling uses are encouraged but not required to comply with this ordinance, with the exception that all exterior pole lighting shall use full-cutoff lighting fixtures.
 - k. Agricultural uses outside of the Night Vision Device Influence Area are encouraged but not required to comply with this ordinance

Cross-reference: See the Sign Code for illumination requirements relating to permanent signs.

xx.4 Definitions.

For the purposes of this Code certain terms and words are defined as follows: the words "used for" include "designed for" and vice-versa; words used in the present tense include the future, the singular tense includes the plural and vice-versa; the word "shall" is always mandatory; the word "may" is discretionary; the masculine gender includes the feminine gender, except as otherwise provided. If a term is not defined herein, but is defined by the IESNA, the IESNA definition shall be utilized, unless the context of the word indicates otherwise. The following terms shall mean:

Artificial Sky Glow. The brightening of the night sky attributable to man made sources of light.

Authority. The person(s) holding the position of (designees).

Candela. The unit of luminous intensity of a lighting source emitted into a given direction.

Canopy. A roof-like covering over an area, in or under which a lighting fixture is mounted.

Canopy (structure). A canopy under which a business provides some service to a customer, such as food service, a bank transaction, or the like.

Common Residential Areas.

- Areas shared in common by residents of two or more dwelling units, i.e. common open space, play area, trash receptacle area, "common property" under a subdivision or partition declaration, etc.
- Two or more open parking spaces, either abutting or within 10 feet of each other and not separated by a wall or other physical barrier between the two parking spaces, designated or set aside for use by the two or more dwelling units, regardless whether the parking space is assigned for exclusive use of each dwelling unit or non-exclusively used by two or more dwelling units, and are either commonly owned or were developed for the purpose of serving the parking needs of "multiple dwellings" or multiple attached single-family dwellings, as defined in the Community Development Code.

Code or Lighting Code. The provisions of this Chapter xx.

Drip Line Area. The area on the ground enclosed by vertical planes extending downward from the outer solid edge of a structure's canopy.

Duplex. A building on a lot designed to contain two dwelling units and used for residential purposes.

Dwelling, Multiple - A building on one or more lots designed to contain three or more dwelling units that share common walls or floor/ceilings with one or more units. The land underneath the structure is not divided into separate lots. Multiple dwelling includes structures commonly called garden apartments, apartments and condominiums.

Dwelling, Single-Family - A detached dwelling unit designed and used for that purpose or an attached dwelling unit, located on its own lot, that shares one or more common or abutting walls with one or more dwelling units. The common or abutting wall shall consist of a structural wall which shared for at least 25 percent of the length of the side of the dwelling. An attached house does not share common floor/ceilings with other dwelling units. An attached house is also called a rowhouse, townhouse, or a common-wall house.

Façade. The exterior wall or elevation of a building.

Glare. Light that causes visual discomfort or disability, and the wattage and/or light distribution is excessive for the purposes for which the illumination is necessary..

Hardscape Permanent improvements to a site, including but not limited to, parking lots, driveways, streets, plazas, sidewalks, walkways, bikeways, abutments, stairs, ramps, and architectural features, such as fountains, sculptures, and the like.

House Side Shield. For fully shielded luminaires only, an internal shield designed and installed by the luminaire manufacturer that significantly attenuates candlepower in the back photometric hemisphere at all angles greater than 30 degrees relative to nadir.

IESNA. The Illuminating Engineering Society of North America (see www.iesna.com).

Intersection. A place where two or more public or private rights-of-way (serving vehicular and/or pedestrian traffic) cross. For purposes of this Code, an “intersection” requires the presence of a street name sign and traffic control sign.

Landscape Lighting. Luminaires attached to structures, mounted on poles or otherwise, or at grade (luminaire not to exceed 3 feet above grade) and used for solely for landscape rather than area lighting.

LED means Light Emitting Diodes.

Light Source: The actual bulb or lamp that emits the light.

Light Trespass. Spill light that because of quantitative, directional, or spectral content causes light level at the property line that is greater than as provided on Table 4 of this Code.

Lighting System. One or more luminaires, together with associated wires, conduits, poles, etc that constitute the illumination system on the parcel.

Lighting Zone. An area established by the (governing body), pursuant to Code xx.5. A description and boundaries of these five lighting zones is given in Appendix xx

Lumen. The unit of luminous flux: a measure of the amount of light emitted by a lamp.

Luminaire (or “Light Fixture”). A complete lighting unit consisting of one or more electric lamps, the lamp holder, reflector, lens, ballast, and/or other components and accessories.

Luminance. The amount of light emitted in a given direction from a surface by the light source or by reflection from a surface. The unit is candela per square meter.

Luminous Flux. A measure of the total light output from a source, the unit being the lumen.

Mounting Height. The vertical distance between the lowest part of the luminaire and the ground surface directly below the luminaire.

Nadir. The downward direction; exactly vertical, directly below a luminaire.

Non-residential Use: Commercial, Industrial, or any other non-residential use defined in the (name applicable document).

Obtrusive Light. Glare and light trespass.

Ornamental or Accent Lighting. Outdoor lighting that is installed mainly or entirely for its decorative effect or to accent an object or a feature, rather than as an aid to visibility.

Shielding.

- Directional. A luminaire designed to be aimed or pointed.
- Fully Shielded. A luminaire emitting no more than 0.5 percent of its luminous flux above the horizontal plane, including any luminaire rated “full cut off” according to IESNA RP-8-01.
- Partly Shielded. A luminaire emitting no more than 10 percent of its total luminous flux above the horizontal plane, including any luminaire rated “semi-cutoff” according to IESNA RP-8-01.
- Shielded. A luminaire emitting no more than 2 percent of its total luminous flux above the horizontal plane, including any luminaire rated “cutoff” according to IESNA RP-8-01.
- Unshielded. A luminaire that may emit its flux in any direction.

Sports Lighting. Lighting installed specifically for lighting of athletic fields for play at levels exceeding 5 footcandles, average, including but not limited to lighting for baseball, softball, football, soccer, tennis, and golf .

Temporary Lighting. Lighting installed with temporary wiring and operated for less than 60 days in any calendar year.

xx.5. Lighting Zones.

1. The designated Lighting Zone for a parcel or project shall determine the limitations for lighting systems and fixtures as specified in this ordinance.
2. Establishing Lighting Zones. The (Authority) shall recommend to the (governing body), and the (governing body) shall establish by resolution Lighting Zones (LZ) within the boundaries of the Night Vision Device Influence Area.
3. The Lighting Zones shall be:
 - a. LZ 2. Low-density suburban and urban neighborhoods and suburban commercial districts. This zone is intended to be the default condition for urban and suburban areas.
 - b. LZ 3. Medium to high-density urban neighborhoods and districts, shopping and commercial districts, industrial parks and districts. This zone is intended to apply only to Central Business District(s) and areas having unique character such as auto malls.
4. Modification of Lighting Zones.
Upon recommendation of the (who) the (governing body) may modify the designated Lighting Zones of one or more parcels if the (governing body) finds that the original Lighting Zone was in error or a change in circumstances has occurred since the existing designation was established .
5. The (Authority) shall maintain the current Lighting Zone map and provide public access to the map upon request.

xx.6 Lighting Systems Standards for Approval.

1. Non-residential Uses and Common Residential Areas.
 - a. All outdoor lighting shall meet all of the following requirements according to Lighting Zone:
 - b. The maximum luminaire lamp wattage and shielding shall comply with Table 1.
 - c. The maximum pole or mounting height shall be consistent with Table 2.
 - d. On-site parking areas shall be constructed of asphalt, dyed concrete or other non-reflective paving surfaces.
 - e. Gas station canopy lighting shall be designed to conceal the illumination source and the lighting fixture shall not extend below the canopy skirt.
 - f. Lighting at publicly owned and privately owned outdoor sports facilities shall be shielded to reduce glare, safety hazards, light trespass and light pollution, and shall provide levels of illuminance consistent with nationally recognized standards such as the Illuminating Engineering Society of North America (IESNA).
 - g. Exterior sign lights shall be shielded and downward facing.

EXCEPTION: upward-facing lighting exclusively for signs and not exceeding 50 rated lamp watts per luminaire. Light sources shall be shielded by orientation with respect to the sign, luminaire construction, and/or louvers or other means of preventing glare.

Additional Provision: intended to minimize light trespass on adjacent properties

Each luminaire shall be set back from all property lines shall be at least 3 times the mounting height of the luminaire.

EXCEPTION 1: If the subject property is abutting a parcel which is zoned "Commercial" or "Industrial" by the Community Development Code, no setback from the common lot lines of the commercial or industrial property is required.

EXCEPTION 2: If the subject property is abutting a parcel which is zoned other than "Commercial" or "Industrial," the luminaire shall be setback three times the mounting height of the luminaire, measured from the abutting parcel's side yard setback. (Any variance, adjustment, of exception to the abutting parcel's side yard setback shall not be considered in the distance calculation.)

EXCEPTION 3: If the luminaire is used for the purpose of street, parking lot or public utility easement illumination purposes and is located less than 3 mounting heights from the property line, the luminaire shall employ a house side shield (opposite the direction of any public right-of-way nearest the luminaire)

EXCEPTION 4: If the subject property includes an exterior column, wall or abutment within 25 feet of the property line, a luminaire partly shielded or better and not exceeding 60 lamp watts may be mounted onto the building façade or under or within an overhang or canopy attached thereto.

2. Special Permit for Specific Lighting Fixtures and Systems and When Exceeding Lighting Requirements.

Upon special permit issued by the (Authority), lighting systems not complying with the technical requirements of this ordinance may be installed, maintained, and replaced for lighting that exceeds the maximums permitted by this Code, e.g., Aerial Lasers, Searchlights, Sports lighting systems (including but not limited to, sport fields and stadiums, such as baseball field and football field lighting, tennis court lighting, and swimming pool area lighting), other very intense lighting defined as having a light source exceeding 200,000 lumens or an intensity in any direction of more than 2,000,000 candelas, construction lighting for public infrastructure and similar projects, emergency construction project that require construction at night, bridges, building façade lighting to light portions of buildings over two stories high, and public monuments.

To obtain such a permit, applicants shall demonstrate that the proposed lighting installation:

- a. Has received every reasonable effort to mitigate obtrusive light and artificial sky glow, supported by a signed statement from a registered civil or electrical engineer describing the mitigation measures. Such statement shall be accompanied by calculations indicating the light trespass levels (horizontal and vertical at ground level) at the property line.
- b. The (Authority) shall review each such application. A permit may be granted if, upon review, the (Authority) finds that the proposed lighting will not create excessive glare, sky glow, or light trespass beyond that which can be reasonably expected by application of best lighting practices, available technology. The (Authority) may impose conditions of approval to mitigate any negative impacts resulting to the abutting parcel, based on best lighting practices and available lighting technology. The (Authority) may charge a review fee and may, at the (Authority)'s option, employ the services of a qualified professional civil or electrical engineer to review such submittals, and the cost thereof shall be an additional fee charged to the applicant.

TABLE 1
MAXIMUM WATTAGE AND REQUIRED SHIELDING

Lighting Zone	Fully Shielded	Shielded	Partly Shielded	Unshielded
LZ 2	100	35	39	Low voltage landscape lighting 50 watts or less
LZ 3	250	100	70	Landscape and façade lighting 100 watts or less; ornamental lighting on private streets of 39 watts and less

TABLE 2
MAXIMUM LIGHTING MOUNTING HEIGHT IN FEET

Lighting Zone	Lighting for Private Roads, Driveways, Parking, Bus Stops and other Transit Facilities	Lighting for Walkways, Bikeways, Plazas and other Pedestrian Areas	All Other Lighting
LZ 2	40	18	8
LZ 3	40	18	16

Lighting mounted onto buildings or other structures shall not exceed a mounting height greater than 4 feet higher than the tallest part of the building or structure at the place where the lighting is installed, nor higher than 33.33 percent of the horizontal distance of the light from the nearest property line, whichever is less.

3. Street Lighting.

- a. Luminaires shall be fully shielded.
- b. Luminaires shall employ internal house side shields unless located in plan at least 3 mounting heights from the any building, structure, or site upon which a building or structure may legally be located within 3 mounting heights of any luminaire.

Additional Provisions: intended to regulate the luminescence of street lighting applications

- c. Street lighting installations shall achieve criterion values listed in Table 3.
Exception: Federal or State requirements that require a higher illumination value than required by this Code.
- d. Unless otherwise approved by the (Authority) street lighting systems shall be designed using the IESNA "Classical" horizontal footcandle method per IESNA/ANSI RP-8-01, and as described below.

- e. The applicant shall submit to (Authority) for approval point-by-point calculations assuming 65 percent light loss factor for metal halide and LED and 80 percent for high pressure sodium, tungsten, fluorescent and induction lamp sources. Submitted street lighting plans shall indicate luminaire types and locations and provide isocandle plots including statistical summaries of roadway lighting.

TABLE 3
STANDARD CRITERIA FOR STREET AND ROADWAY LIGHTING
 (footcandles - fc)

	LZ 2	LZ 3
Local streets	Intersections only*	
Avg: Light Level	0.3 fc	0.4 fc
Avg: Min Uniformity	6:1	6:1
Max: Min Uniformity	40:1	40:1
Neighborhood Collectors	Intersections only*	
Avg: Light Level	0.4 fc	0.6 fc
Avg: Min Uniformity	4:1	4:1
Max: Min Uniformity	20:1	20:1
Major Collector / Minor Arterial		
Avg: Light Level	0.4 fc	0.6 fc
Avg: Min Uniformity	4:1	4:1
Max: Min Uniformity	20:1	20:1
Major Arterials		
Avg: Light Level	1.0 fc	1.5 fc
Avg: Min Uniformity	4:1	3:1
Max: Min Uniformity	20:1	10:1

** Luminaires only within 150 feet of the centerpoint of an intersection. Intersections may include significant driveways or site roads as permitted by the Authority.*

xx.7 Non-Conforming Uses.

Outdoor lighting fixtures lawfully existing prior to the adoption of this Ordinance that do not conform to the provisions of this Ordinance shall be deemed to be a lawful nonconforming use and may remain.

1. New or Changed Uses, New Structures, Major Additions or Modifications.

- a. New Uses or Structures, or Change of Use. Whenever there is a new use or upon a property or the use on the property is changed after [effective date of this Ordinance], all outdoor lighting on the property shall be brought into compliance with this Code before the new or changed use commences.
- b. Major Additions. If a major addition occurs on a property, the entire property shall comply with the requirements of this Code. For purposes of this section, the following are considered to be major additions:
 - c. Additions of 25 percent or more in terms of additional dwelling units, gross floor area, seating capacity, or parking spaces, either with a single addition or with cumulative additions after [effective date of this Ordinance].
 - d. Single or cumulative additions, modification or replacement of 25 percent or more to installed outdoor lighting luminaires existing as of [effective date of this Ordinance].

2. Minor Modifications, Additions, or New Lighting Fixtures for Non-residential and Multiple Dwellings

- a. For non-residential and multiple dwellings, all additions, modifications, or replacement of less than 25% of outdoor lighting fixtures existing as of [effective date of this Ordinance] shall require the submission of a complete inventory and site plan detailing all existing and any proposed new outdoor lighting.
- b. Any new lighting on the site shall meet the requirements of this Code.

3. Resumption of Use after Abandonment.

If a property or use with non-conforming lighting is abandoned for a period of six months or more, then all outdoor lighting shall be brought into compliance with this Code before any further use of the property occurs.

4. Repair of Existing Lighting.

When existing lighting equipment requires any repairs other than re-lamping, it shall be modified so as to comply with the shielding requirements of this Ordinance.

xx.8 Submittal Requirements

The owner or owners of a tract of land within the lighting review area shall submit to the Authority Planning Office a site plan for the development and use of such tract meeting the requirements set forth in Authority Zoning Ordinance. Subdivisions shall comply with the Authority Subdivision Guidelines.

1. A lighting plan shall be included as part of the required site plan submittal or subdivision construction drawings which shall contain but not be limited to the following:
 - a. The location of the site where the outdoor light fixtures will be installed;
 - b. Plans indicating the location on the premises of each outdoor light fixture, both proposed and any already existing on the site, and the types of outdoor light fixtures;
 - c. A description of the outdoor light fixtures including but not limited to manufacturer's catalog cuts and drawings;
 - d. If any subdivision proposes to have installed street or other common or public area outdoor lighting, a lighting plan shall also be submitted for all such lighting.
 - e. For any property that contains restrictive avigational easements owned by the United States of America, the owner or owners shall also submit a copy of the lighting plan to Fort Campbell, or its agent, and obtain their written approval before any building permits shall be issued by the Authority.

Sample Lighting Ordinance #2: Village of Homer Glen, Illinois

AN ORDINANCE REGULATING OUTDOOR LIGHTING IN THE VILLAGE OF HOMER GLEN

WHEREAS, the safety and welfare of pedestrians, cyclists, and motorists depend upon the reduction of glare and the establishment of consistent and well-defined levels of lighting; and

WHEREAS, proper direction and use of light will minimize energy wasted on unnecessary and indiscriminate illumination: and

WHEREAS, the corporate authorities recognize the night sky as a natural resource; and

WHEREAS, the corporate authorities and the Homer Glen Green Vision recognize the need to preserve rural character, aesthetic value, and the unique quality of life of Homer Glen residents by preserving and enhancing the ability to view the night sky: and

WHEREAS, the corporate authorities and the Village of Homer Glen Comprehensive Plan recognize the need to define limits and protect residents and business owners from the trespass of excessive and misdirected light from adjacent properties: and

WHEREAS, establishing a predetermined standard for outdoor illumination will provide residents, business owners, and developers with a clear set of guidelines by which to follow: and

WHEREAS, a clear set of guidelines for outdoor lighting will eliminate the need for commercial establishments to compete for visual attention by escalating outdoor lighting levels; and

WHEREAS, the corporate authorities wish to promote sound environmental policies which will benefit residents and serve as a positive example to surrounding communities; and

WHEREAS, excessive illumination can have a detrimental effect to wildlife that depend on the natural cycle of day and night for survival.

NOW, THEREFORE, BE IT ORDAINED BY THE PRESIDENT AND VILLAGE BOARD OF TRUSTEES OF THE VILLAGE OF HOMER GLEN, WILL COUNTY, ILLINOIS, THAT:

Section 1: APPLICABILITY

All zoning lots in the following zoning districts shall comply with the provisions of this Ordinance as of its effective date unless otherwise exempted herein:

- A-1 Agricultural District
- A-2 Rural Residence District
- E-1 Single Family Estate Residence District
- E-2 Single Family Rural Residence District
- R-1 Single Family Residence District
- R-2 Single Family Residence District
- R-2A Single Family Residence District
- R-3 Single Family Residence District
- 2
- R-3A Single Family Residence District
- R-4 Single Family Residence District
- R-5 Single Family Residence District
- R-6 Single Family Residence District
- R-6A Multi-Family Residence District

- C-1 Neighborhood Business District
- C-2 Local Business District
- C-3 General Business District
- C-4 Highway Commercial District
- C-5 Office and Research Park District
- C-6 Commercial Recreation District
- I-1 Industrial District

Unless specifically exempted within this ordinance, zoning lots within all future residential, commercial, and industrial zoning districts created after the effective date of this Ordinance shall comply with the provisions of this Ordinance.

For clarity and organization, references are made within this ordinance to Residential Lighting Zones and Commercial Lighting Zones. These lighting zones are defined in the DEFINITIONS section of this ordinance.

Section 2: CONFORMANCE

Any existing luminaire or lighting installation used for outdoor lighting in any zoning district on the effective date of this Ordinance that does not comply with the requirements of this Ordinance shall be considered a non-conforming use. Except as otherwise stated herein, such uses shall be made to comply with the requirements of this Ordinance or be removed within such time period as established in Section 10.2-5 b. of the Village of Homer Glen Zoning Ordinance adopted October 24, 2006, effective November 10, 2006.

ANY non-conforming luminaire or light installation existing on any zoning lot in any zoning district as of the effective date of this ordinance shall be made to comply with the requirements of this Ordinance or be removed within 30 days if any of the following criteria are met:

1. The luminaire is producing glare that is deemed by the Village to create a hazard or nuisance; or
2. The height or location of the luminaire is changed; or
3. The luminaire is changed or replaced (excluding routine maintenance and bulb replacement of equal light output) except if it is part of a parking lot lighting installation consisting of an array of 3 or more identical luminaires and poles or supporting structures; or
4. The supporting structure for the luminaire is changed or replaced except if it is part of a parking-lot lighting installation consisting of an array of 3 or more identical luminaires and poles or supporting structures; or
5. The use of the luminaire is resumed after a period of abandonment.

ALL non-conforming luminaires existing on any zoning lot in any zoning district as of the effective date of this ordinance shall be made to comply with the requirements of this Ordinance or be removed within 30 days if any of the following criteria are met:

1. A cumulative total of twenty-five percent (25%) or more of the nonconforming luminaires or their supporting structures are changed, replaced (excluding routine maintenance and bulb replacement of equal light output), or relocated; or
2. A "Principal Structure" (as defined in the Village of Homer Glen Zoning Ordinance) on said zoning lot is expanded by an amount equal to or greater than 25% of the total square footage of the structure immediately prior to such expansion; or
3. There is a change in zoning of said zoning lot.

Section 3: ILLUMINATION STANDARDS

3.1 GROSS EMISSION OF LIGHT Commercial Lighting Zones

The total light output from all luminaires used for outdoor lighting on any zoning lot in a commercial lighting zone, except for street lighting, outdoor display lots, and outdoor lighting of playing fields on public property, shall not exceed 100,000 lumens per net acre.

3.2 LIGHT INTENSITY AND UNIFORMITY

Commercial Lighting Zones

During permitted hours of operation as defined within this Ordinance, outdoor lighting on any zoning lot in a commercial lighting zone shall meet the following requirements for light level as measured in the plane of the illuminated surface:

ILLUMINATED SURFACE	MINIMUM LIGHT LEVEL	MAXIMUM LIGHT LEVEL
NON-INTERNALLY-ILLUMINATED SIGNS, BUILDINGS, & GROUND - (LIGHT COLOR)	---	5.0 FOOTCANDLES
NON-INTERNALLY-ILLUMINATED SIGNS, BUILDINGS, & GROUND - (MEDIUM COLOR)	---	10.0 FOOTCANDLES
NON-INTERNALLY-ILLUMINATED SIGNS, BUILDINGS, & GROUND - (DARK COLOR)	---	15.0 FOOTCANDLES
AUTO DEALERSHIPS: FRONT ROW & FEATURE DISPLAYS	---	20 10
OTHER MERCHANDISE AREAS		
PUBLIC PARKING AREAS*	0.25 FOOTCANDLES	4.5 FOOTCANDLES
VEHICULAR ENTRANCES FROM RIGHT-OF-WAY*	1.0 FOOTCANDLES	4.5 FOOTCANDLES
PLAYING FIELDS	---	IESNA**
AUTOMOBILE SERVICE-STATION	10 FOOTCANDLES	30 FOOTCANDLES

PUMPING AREAS

DRIVE-IN/DRIVE-THROUGH CANOPIES	---	15 FOOTCANDLES
BUILDING ENTRANCE AND EXIT PEDESTRIAN PATHWAYS*	1.0 FOOTCANDLES	5.0 FOOTCANDLES
STAIRWAYS AND STEPS*	1.0 FOOTCANDLES	5.0 FOOTCANDLES

*Maximum-to-minimum light level ratio shall not exceed 15:1.

**Illuminance level specified in Table 7 of IESNA document RP-6-01.

3.3 LIGHT DIRECTION & CONTROL

Residential Lighting Zones and Commercial Lighting Zones

Any luminaire which is used for uplighting on any zoning lot in a residential or commercial lighting zone shall have the necessary shielding and/or beam-angle control and/or shall be aimed to substantially confine the directed light to the object intending to be illuminated. Uplighting shall only be permitted for landscape lighting, architectural lighting, flag lighting, and lighting of ground-mounted signs that are not internally illuminated. Uplighting applications shall meet the following requirements:

UPLIGHTING APPLICATION	MAXIMUM INCLINATION	MAXIMUM LIGHT OUTPUT
LANDSCAPE LIGHTING	60°	1100 LUMENS† (UP TO 45°)
		800 LUMENS†† (UP TO 60°)
ARCHITECTURAL LIGHTING	45°	1100 LUMENS†
FLAG LIGHTING*	60°	1100 LUMENS† (UP TO 45°)
		800 LUMENS†† (UP TO 60°)
SIGN LIGHTING **	45°	1100 LUMENS†

* The tradition of lowering flags at sunset is encouraged to avoid the need for lighting.

** Ground-mounted, non-internally-illuminated signs only.

† Typical 75W incandescent bulb or 50W low-voltage halogen landscape bulb.

†† Typical 60W incandescent bulb or 35W low-voltage halogen landscape bulb.

Residential Lighting Zones

Any luminaire with a light output exceeding 1100 lumens which is used for outdoor lighting on any zoning lot in a residential lighting zone shall have the necessary shielding and/or beam-angle control and/or shall be aimed so that the direction of all directly emitted light is at or below horizontal. If a motion-activated sensor that illuminates the luminaire for no more than 5 minutes upon activation is used, however, said luminaire may have a light output of up to 2200 lumens.

Any luminaire with a light output exceeding 2200 lumens which is used for outdoor lighting on any zoning lot in a residential lighting zone shall have the necessary shielding and/or beam-angle control and/or shall be aimed so that the light source is not visible along any property line, as viewed at a height of 60 inches above grade.

Commercial Lighting Zones

Except as otherwise stated herein, any luminaire on any zoning lot in a commercial lighting zone which emits light directed at a building, sign, billboard, or other outdoor feature shall be located at or above the top of said object and aimed and controlled so that the direction of all emitted light is at or below horizontal and the directed light is substantially confined to the object intending to be illuminated.

3.4 LIGHT TRESPASS

Except for street lighting, light emitted from outdoor lighting on any zoning lot shall not cause the light level along any property line, as measured at a height of 60 inches above grade in a plane at any angle of inclination, to exceed the following limits:

EMITTING ZONING LOT	IMPACTED ZONING LOT	MAXIMUM LIGHT LEVEL
RESIDENTIAL LIGHTING ZONE	RESIDENTIAL LIGHTING ZONE	0.1 FOOTCANDLES
RESIDENTIAL LIGHTING ZONE	COMMERCIAL LIGHTING ZONE	0.5 FOOTCANDLES
COMMERCIAL LIGHTING ZONE	RESIDENTIAL LIGHTING ZONE	0.1 FOOTCANDLES
COMMERCIAL LIGHTING ZONE	COMMERCIAL LIGHTING ZONE	0.5 FOOTCANDLES

3.5 PERMITTED HOURS FOR OUTDOOR LIGHTING

Commercial Lighting Zones

Except for street lighting, outdoor lighting on any zoning lot in a commercial lighting zone is permitted to be lighted between one-half hour before sunset and 10:00 p.m. or 1 hour after the close of business based on normal hours of operation of the business, whichever is later. Thereafter, for safety and security purposes, security lighting is permissible at a total light output not greater than 25% of the total light output from all outdoor lighting located on the zoning lot during permitted outdoor lighting hours. During security lighting hours, no luminaire may exceed its light output exhibited during permitted outdoor lighting hours.

Property Used for Governmental & Public Purposes

Any zoning lot in any zoning district used for governmental or public purposes, except for street lighting, shall comply with the permitted hours and security lighting limitations for commercial lighting zones. In addition, outdoor lighting of the playing field of an organized sporting event on public property that is in progress at the close of permitted outdoor lighting hours shall be allowed to remain illuminated until 30 minutes after the conclusion of the event but no later than 11:00 p.m. No outdoor lighting of the playing field for any sport or recreational purpose shall be initiated after 10:00 p.m.

Section 4: LUMINAIRE STANDARDS

4.1 FULL-CUTOFF REQUIREMENT

Commercial Lighting Zones

Except for uplighting applications permitted within this ordinance, any luminaire used for outdoor lighting in a commercial lighting zone shall be a full-cutoff luminaire and shall be installed in the proper orientation to achieve full-cutoff performance with respect to a horizontal plane.

Street Lighting

Any luminaire used for street lighting shall be a full-cutoff luminaire and shall be installed in the proper orientation to achieve full-cutoff performance with respect to a horizontal plane. Said luminaire, as well as any poles, brackets, supports, and mounting hardware shall comply with current Village design standards.

4.2 INSTALLED HEIGHT

The installed height of any luminaire used for outdoor lighting on any zoning lot, except for street lighting, shall not exceed the following limits:

ZONING LOT MAXIMUM	INSTALLED HEIGHT*
RESIDENTIAL LIGHTING ZONE	20 FT
COMMERCIAL LIGHTING ZONE	25 FT

* A maximum installed height of 50 ft shall be permitted for lighting of playing fields on public property.

Section 5: PROHIBITED OUTDOOR LIGHTING

The following outdoor lighting applications are prohibited in all zoning districts:

1. The use of laser light source;

2. The use of flickering, flashing, blinking, scrolling, or rotating lights and any illumination that changes intensity;
3. The use of upward directed lighting, except as otherwise permitted herein;
4. Architectural lighting of any portion of a building or structure with a polished or glass exterior surface that uses uplighting;
5. The use of searchlights;
6. The use of neon light to accent buildings or architectural features;
7. The use of Mercury vapor light source except for existing uses in A-1 or A-2 zoning districts used for "Agriculture" as defined in the Village of Homer Glen Zoning Ordinance;
8. The use of Metal Halide light source for new public-parking-lot lighting installations; and
9. Any luminaire creating glare that is deemed by the Village to create a hazard or nuisance.

Section 6: EXEMPT OUTDOOR LIGHTING

The following outdoor lighting applications are exempt from all requirements of this ordinance:

1. Underwater lighting used for the illumination of swimming pools and fountains;
2. Lighting required by county, state, or federal law;
3. Temporary lighting used for holiday decoration;
4. Decorative yard lighting characterized by a flame source;
5. Portable lighting temporarily used for maintenance or repair that is not deemed by the Village to create a hazard or nuisance;
6. Emergency lighting used by police, firefighting, emergency management, or medical personnel at their discretion as long as the emergency exists;
7. Lighting approved by the Village for temporary events such as carnivals, circuses, festivals, picnics, fairs, civic events, and exhibitions; and
8. Temporary lighting required for road construction or other public improvements.

Section 7: PROCEDURAL REQUIREMENTS

7.1 PLAN SUBMISSION

For subdivision and land-development applications where outdoor lighting is required or proposed, lighting plans shall be submitted to the Village for review and approval and shall include:

1. A site plan complete with all structures, parking spaces, building entrances, traffic areas (both vehicular and pedestrian), vegetation that might interfere with lighting, and all adjacent uses. The site plan shall show, by location, and identify each existing and proposed luminaire and shall specify its installed height, pole foundation details, and mounting methods;
2. Iso-footcandle plots for individual lighting installations, or 10' x 10' illuminance grid plots for multi-fixture lighting installations, which demonstrate compliance with all applicable requirements set forth within this Ordinance. The plots shall indicate the location of each existing and proposed luminaire, the installed height of said luminaires, and the overall light levels in foot candles on the entire zoning lot and at the property lines;
3. A summary table identifying the maximum and minimum light levels for all parking areas, entryways, signs, and walkways.
4. A description of each luminaire identified in the site plan including the manufacturer, model number, a photograph or catalog cut, photometric data verifying any compliance requirements specified within this ordinance, light output in initial lumens, shielding or glare reduction devices, lamp type, and on/off control devices.

7.2 POST-APPROVAL ALTERATIONS

Post-approval alterations to lighting plans or intended substitutions for approved lighting equipment shall be submitted to the Village for review and approval, with all plan submission requirements set forth within this Ordinance, prior to installation.

7.3 RIGHT OF INSPECTION

The Village shall have the right to conduct a post-installation inspection to verify compliance with the requirements of this Ordinance and, if appropriate, to require remedial action at the expense of the applicant.

Section 8: DEFINITIONS

ABANDONMENT: Discontinuance in the usage of a lighting installation, or portion thereof, with no intention to resume the usage of such lighting. A lighting installation or portion thereof, that has not been operated for a period of 24 months or longer, shall be considered to be abandoned.

ARCHITECTURAL LIGHTING: Outdoor lighting directed at buildings, facades, structures, monuments, and other architectural features.

AUTOMOBILE SERVICE STATION (GAS STATION): Any building or premises used for dispensing or offering for sale automotive fluids or oils, having pumps and underground storage tanks; also, where battery, tire, and other similar services are rendered, but only if rendered wholly within a building. Automobile service stations shall not include the sales or storage (new or used) of automobiles, trailers, or other vehicles. Automobile service stations may include mini-marts as a Special Use.

AUTOMOBILE SERVICE STATION PUMPING AREA: The drivable surface of an automobile service station, in the immediate vicinity of a fuel pump, where vehicles are parked during fueling.

BILLBOARD: A surface whereon advertising matter is set in view conspicuously and which advertising does not apply to premises or any use of premises wherein it is displayed or posted.

COMMERCIAL LIGHTING ZONE: Any zoning lot in any zoning district that does not have as its primary use a single-family residential dwelling, a two-family residential dwelling, or land used for "Agriculture," as defined in the Village of Homer Glen Zoning Ordinance.

DIRECTIONALLY SHIELDED: A luminaire which uses shielding, lenses, or other means to provide a distinct focused beam of emitted light.

FOOTCANDLE: A unit of measure of luminous flux.

FULL-CUTOFF LUMINAIRE: A luminaire having a light distribution (excluding incidental reflection from poles, mounting brackets, and other supporting structures), as determined by photometric test and certified by the manufacturer, such that no light is emitted at or above an angle of 90° above nadir in any direction and the luminous flux emitted in the band between 80° and 90° above nadir in all directions is no more than 10% of the total luminous flux for the luminaire. A luminaire that meets the Illumination Engineering Society of North America (IESNA) full-cutoff definition shall be considered full cutoff for the purposes of this ordinance.

GLARE: A visual disturbance produced by a distinct light source within the visual field that is sufficiently brighter than the level to which the eyes are adapted.

HID LIGHTING: A high-intensity discharge family of lighting that includes high pressure sodium, fluorescent, mercury vapor, and metal halide type bulbs.

IESNA - Illumination Engineering Society of North America.

ILLUMINANCE: The amount of luminous flux falling onto a unit of surface area, correlating to the perception of brightness by the human eye. Illuminance is typically measured in lumens per square foot (footcandles) or lumens per square meter (lux).

INSTALLED HEIGHT: The height above grade of the lowest point on an installed luminaire.

INTERNALLY ILLUMINATED SIGN: A sign illuminated by a light source internal to the sign enclosure which is not directly visible externally. For the purposes of this ordinance, a neon-light sign is considered an internally illuminated sign.

LAMP: The source of light being emitted from a luminaire, such as a bulb.

LANDSCAPE LIGHTING: Outdoor lighting directed at trees, shrubs, plants, flower beds, fountains, gardens, and other natural or landscaped features.

LIGHT: Electromagnetic radiation within a range of wavelengths sufficient for visual perception by the normal unaided human eye.

LIGHT LEVEL: The illuminance as measured in accordance with the practices contained in the IESNA Lighting Handbook, Eight Edition.

LIGHT OUTPUT: Luminous Flux (see definition for Luminous Flux).

LIGHTING INSTALLATION: An arrangement of one or more luminaires including any mounting hardware, brackets, and supporting structures.

LUMEN: A unit of measure of luminous flux. For the purposes of this ordinance, "lumens" denotes initial lumens for HID lighting applications.

LUMINAIRE: An individual lighting assembly including the lamp and any housings, reflectors, globes, lenses, shields or other components designed to block or distribute light. For the purposes of this ordinance, an internally illuminated sign is not considered a luminaire.

LUMINOUS FLUX: The power emitted from a source of electromagnetic radiation, such as a light bulb, in the form of visible light. Luminous flux is measured in lumens (or lux) and is typically specified by the manufacturer for a given lamp or luminaire. Typical luminous flux values for incandescent bulbs are 100W: 1550 lumens, 75W: 1080 lumens, 60W: 780 lumens, and 40W: 450 lumens.

MOTION-ACTIVATED SENSOR: A sensor which causes a luminaire to become illuminated automatically upon the presence of motion or infrared radiation or a combination thereof within its field of view.

NADIR: The direction pointing directly downward from the light source of the luminaire that originates from a horizontal plane at the lowest point on the luminaire.

NEON LIGHT: Brightly colored light generated by using electric current to excite a gas or gas mixture (including neon, argon, helium, or other gases) typically contained in a tube which can be bent into various forms for use as decoration or signs. For the purposes of this ordinance, fluorescent tubes are not considered neon light.

NET ACREAGE: "Net Acreage" as defined in the Village of Homer Glen Zoning Ordinance.

OUTDOOR DISPLAY LOT: An outdoor area whose primary function is the sale of displayed merchandise, often requiring accurate color perception by customers.

ORGANIZED SPORTING EVENT: A prearranged sports or recreational event involving at least one group or team with a published roster and schedule.

OUTDOOR LIGHTING: Light generated from an indoor or outdoor source that provides illumination to a surface, building, sign, structure, device, or other outdoor feature which is visible to an observer located outdoors. For the purposes of this ordinance, the light source inside an internally illuminated sign is not considered outdoor lighting.

PLAYING FIELD: An open outdoor field or court used for playing sports such as baseball, soccer, football, tennis, volleyball, and basketball.

PUBLIC PARKING AREA: A drivable surface intended for use by the general public for parking of motorized vehicles.

RESIDENTIAL LIGHTING ZONE: Any zoning lot in a residential or agricultural zoning district that has as its primary use a single-family residential dwelling or a twofamily residential dwelling, as defined in the Village of Homer Glen Zoning Ordinance.

SEARCHLIGHT: A lighting installation designed to project a high-intensity beam of approximately parallel rays of light that is typically used to sweep the sky for promotional purposes.

STREET LIGHTING: One or more luminaires or light installations designed to illuminate a public roadway or intersection.

UPLIGHTING: Lighting applications which direct light above a horizontal plane.

VISIBLE LIGHT: See "Light"

ZONING LOT: "Zoning Lot" as defined in the Village of Homer Glen Zoning Ordinance.

Section 9: APPEALS FOR VARIATIONS

Request for variation from the requirements of this Ordinance may be initiated by written application which seeks to vary the provisions of this Ordinance. The application requesting a variation shall be accompanied by a fee equal to the fee charged for a zoning variation and shall be submitted to the Plan Commission for initial consideration. The Application shall indicate the specific provisions of this Ordinance which the applicant seeks to vary. The Plan Commission will schedule a public hearing concerning the Application. The public hearing will be conducted in accordance with the notice and hearing requirements of Village of the Homer Glen Zoning Ordinance as they pertain to and concern public hearings for variations. The Plan Commission may also establish appropriate procedures and filing requirements for the applicants requesting variations to follow. After the Plan Commission conducts the public hearing it shall make a written, recommendation to the Village Board concerning the requested variation. Without further public hearing, the Village Board may grant, deny or amend the recommendation for variation.

Section 10: VIOLATION AND PENALTY

Any person, firm, corporation or business entity that violates any provision of this Ordinance shall be subject to a fine of not less than \$250.00 and not more than \$750.00 for each separate offense. A separate offense shall be deemed committed on each day a violation occurs or continues to occur.

Section 11: ENFORCEMENT

The Chief Building Official, Deputy Building Official and such other persons who are duly appointed as Code Enforcement Officers are hereby authorized to inspect luminaires and lighting installations in the zoning districts subject to this Ordinance to determine compliance with the applicable provisions and, if necessary, to issue notices of violation to the owner, operator or other person or entity responsible for maintenance of the luminaire or lighting installation, if the luminaire or lighting installation fails to comply with the provisions of this Ordinance. The notice of violation shall set forth an appropriate time period of not less than thirty (30) days for compliance. In the event the violation is not corrected within the time limits set forth in the notice of violation, proceedings to enforce compliance with the provisions of this Ordinance may be initiated and conducted in accordance with and pursuant to the provisions of Ordinance 07- which is the Village ordinance establishing a code hearing department for building code violations, or by the filing of an appropriate lawsuit seeking legal and equitable relief in a court of competent jurisdiction.

Section 12: REPEALER

All ordinances or portions of Ordinances previously passed or adopted by the Village of Homer Glen that conflict with or are inconsistent with the provisions of this Ordinance are hereby repealed to extent of such conflict or inconsistency.

Section 13: SEVERABILITY

The various provisions of this Ordinance are hereby expressly declared to be severable and if any part or portion of this Ordinance shall be held to be invalid by any court of competent jurisdiction, such decision shall not affect the validity of the remaining provisions of this Ordinance, which shall be enforced to the fullest extent possible.

Section 14: EFFECTIVE DATE

This Ordinance shall be in full force and effect from and after its passage and approval. Adopted this _____ day of _____, 2007 pursuant to a roll call vote as follows:

APPROVED by the Village President on _____, 2007.

Lighting Regulation Narrative

(Adopting Agency or Community Name)
Outdoor Lighting Ordinance

On xxx, the (adopting agency) passed into law a new, state of the art lighting ordinance. Its goals are to permit all necessary and reasonable uses of outdoor lighting, while reducing wasted energy and light pollution. A key consideration is preserving the nighttime visual environment for Night Vision Device training activity at Scott Air Force Base.

The law applies to all new outdoor lighting, including new lighting, replacement lighting and additions to new lighting. Single-family houses and two-family dwelling units are among the exempted uses.

Basic Principles

Light pollution is a broad term describing the undesirable side effects of outdoor lighting. The most negative effects of outdoor lighting include:

- *Artificial sky glow*, the illumination of clouds and airborne particles, causing the sky to glow and preventing astronomy and star gazing;
- *Light trespass*, the unwanted illumination caused by light from neighboring properties.
- *Glare*, when lighting causes discomfort or visual disability
- *Circadian Interruption*, when lighting causes unwanted changes in the circadian cycles of living organisms
- Other impacts to flora and fauna, particularly those causing changes in habitat or behavior

Most light pollution is the result of carelessly applied lighting. This Ordinance helps prevent most light pollution by limiting the wattage of lighting that can be used, by requiring most lighting to be shielded, and requiring lighting to be installed thoughtfully with respect to mounting height, setback, and in some critical cases, additional shielding. In addition, while the Ordinance does not absolutely prohibit incandescent lighting, preference is given for energy efficient lighting, and for most installations, the use of energy efficient sources is strongly urged.

Demonstrating Compliance with the Ordinance

Lighting for Homes Multi-family buildings with common areas such as parking garages or lots will be treated as commercial buildings for purposes of lighting standards.

Private Non-Residential Uses The Ordinance governs all new lighting as well as replacement lighting and expansions of existing lighting systems. The law is strict; even if a luminaire is broken, it must be replaced with a complying luminaire. For new installations including major additions and alterations, lighting plans including schedules and cutsheets must be supplied complete with calculations showing compliance. Lighting plans with fixture schedules and calculations must be submitted for approval, along with compliance documentation forms (*compliance documentation forms can be downloaded from the city/county website*).

Special Permit Applications Some lighting systems, such as sports lighting or searchlights, cannot comply with the Ordinance. A special permit will be required. Applicants may be required to submit detailed calculations and to pay for an independent engineering review.

Street Lighting Applications In addition to demonstrating compliance with the Ordinance's power and shielding requirements, plans for street lighting systems must be submitted using point-by-point calculations to demonstrate compliance with street lighting criteria contained in the Ordinance.



A fully shielded wall lantern



A fully shielded dusk to dawn luminaire

Multi-Family Residential Lighting Requirements

In general, lighting for homes must be:

- Limited to 40 watts per luminaire (light fixture) and designed so that the lamp (light bulb) can't be seen from a neighboring property. Examples of appropriate luminaires are posted on the (city/county) website. Also check the International Dark Sky Association website (www.darksky.org) for appropriate luminaires. Luminaires don't have to be fully shielded, but they must hide the lamp sufficiently to prevent glare and obtrusive light onto adjacent properties
- **Energy Star** rated, which generally means uses compact fluorescent lamp(s).
- Mounted at or lower than the eave line, or 12 feet above the ground, whichever is **lower**.

There are three *exceptions*.

- You can use PAR-lamp directional luminaires with halogen PAR lamps up to 100 watts. But they must be aimed away from neighboring properties. These fixtures are commonly used for residential security lighting.
- You can use fully shielded luminaires up to 100 watts, and they can be mounted up to 25' feet above grade as long as they are at least 3 times the mounting height away from the property line. These fixtures are generally used for dusk-to-dawn area lighting, especially for rural and agricultural sites.
- You can install low voltage landscape lighting, except in lighting zone 0 and 1A.

Non-Residential Lighting Requirements

Most community complaints about lighting involve commercial or industrial sites. Poorly designed and/or wasteful lighting causes off-site glare and detracts from the night time beauty of the community. For this reason, all new and replacement lighting from now on must meet the following rules:

Lighting Zones

For lighting, the Night Vision Device Influence Area is divided into two zones. A current map of the lighting zones is available from the (fill in) website. Zones are set by the (Authority).

LIGHTING ZONE	CONDITION	TYPICAL PARTS OF THE (AREA)
LZ0	AREAS WHERE PROHIBITION OF NIGHT LIGHTING IS STRONGLY DISCOURAGED	SOME EXAMPLES INCLUDE WILDLIFE PRESERVES, NIGHT TRAINING AREAS, AND ASTRONOMICAL OBSERVATORIES AND OBSERVATION AREAS
LZ1	AREAS WHERE MAN-MADE LIGHTING IS USED IN LOW AMOUNTS IN RURAL AREAS	RURAL COMMUNITIES
LZ2	AREAS WHERE MAN-MADE LIGHTING IS USED IN MODEST AMOUNTS FOR SAFETY, SECURITY AND TRADITIONAL USES	URBAN NEIGHBORHOODS AND MOST COMMERCIAL DISTRICTS
LZ3	AREAS WHERE MAN-MADE LIGHTING IS AN IMPORTANT ASPECT OF A DISTRICT OF NIGHT ACTIVITY, OR WHERE SECURITY OR SAFETY ARE ESPECIALLY IMPORTANT	CENTRAL BUSINESS DISTRICT
LZ4	SPECIAL HIGH-LIGHT ZONES	BY SPECIAL PERMIT ONLY

Mounting Height

The mounting height of luminaires is limited according to Table 3 below. If luminaires are mounted to poles, the pole height may be taller as long as the highest part of the luminaire's optics is mounted at or below the appropriate value from the table below. These mounting height limits apply whether the luminaire is mounted to a pole, building or other structure and is measured relative to the grade directly below the luminaire. If there are excessive changes in grade on the site, be sure to adjust the design to prevent off site impacts for lower adjacent properties.

Table 3
MAXIMUM LIGHTING MOUNTING HEIGHT IN FEET

Lighting Zone	Lighting for Private Roads, Driveways, Parking, Bus Stops and other Transit Facilities	Lighting for Walkways, Bikeways, Plazas and other Pedestrian Areas	All Other Lighting
LZ 0	20	8	4
LZ 1	25	12	4
LZ 2	40	18	8
LZ 3	40	18	16
LZ 4	Height limit to be determined by Special Use Permit Only		

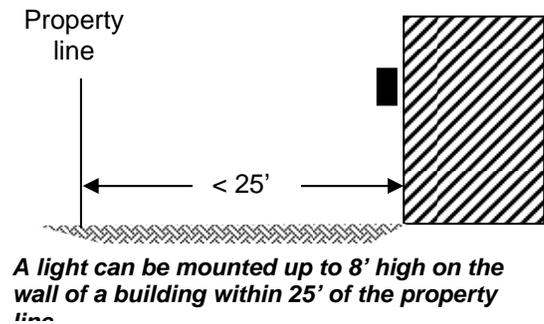
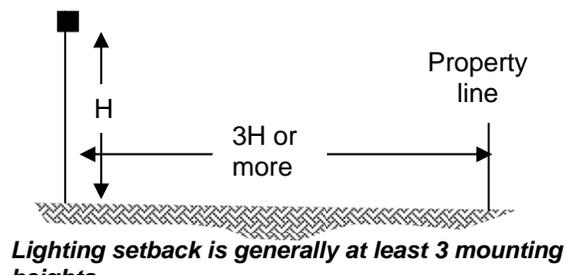
The Prescriptive Method

This method requires simple hand calculations and installations must follow specific rules, but detailed lighting calculations are not required. This method is recommended for most outdoor lighting installations, especially those undertaken by persons with little or no lighting expertise.

Prescriptive Method Setback Requirements (Note this provision is identified as optional in the Ordinance)

Setback, when combined with other prescriptive requirements, helps minimize off-site impacts. The setback requirements are fairly simple:

- As a general rule, luminaires must be at least 3 times their mounting height from the property line.
- If your property abuts a property zoned "industrial", then luminaires can be mounted anywhere on your property relative to that property line.
- If your property abuts a property zoned other than industrial or commercial, then luminaires must be mounted at least 3 times their mounting height from the abutting property's side yard setback line.
- If a luminaire on your property is used for the purpose of street, parking lot or public utility easement illumination purposes, it can be located less than 3 mounting heights from the property line, but it must employ a house side shield and the luminaire must be aimed away from the property line. A house side shield is an internal component available for most suitable luminaires. External shields added after the fact are not permitted.
- If a building or structure is mounted within 25 feet of the property line, then shielded or fully shielded luminaire(s) can be mounted onto the structure at a mounting height not to exceed 8 feet above grade at the foundation. Lighting recessed into a canopy or enclosed by an awning or similar structure can also be used,



Prescriptive Method Luminaire Requirements

In order to prevent luminaires from being too bright and causing glare, the rated wattage is limited according to lighting zone and shielding by Table 1. Better shielding allows more power per luminaire, within the limits for each lighting zone.

Table 1 MAXIMUM WATTAGE AND REQUIRED SHIELDING

Lighting Zone	Fully Shielded	Shielded	Partly Shielded	Unshielded
LZ 2	100	35	39	Low voltage landscape lighting 50 watts or less
LZ 3	250	100	70	Landscape and façade lighting 100 watts or less; ornamental lighting on private streets of 39 watts and less



Fully shielded means that light is not emitted above the horizontal plane, and that the amount of light emitted at high angles is limited.



Shielded means that a small amount of light may be emitted above the horizontal plane, but that the source is still shielded and most of the light is downward.



Partly shielded means that the light source is hidden and that there is a solid top to prevent upward light; but light is radiated sideways as well as downward.



Unshielded means that light is emitted indiscriminately, or is purposely aimed upwards.

Prescriptive Method Total Lighting Limits

The primary cause of light pollution is the *amount* of electric light, as light from even the most shielded light sources bounces up when it hits the ground. For non-residential sites (including multiple residences with common areas) calculate the maximum allowed lighting power as follows:

1. Refer to Table 2.
2. Note which lighting that is EXEMPT. You do not have to include exempt lighting in any way. It is unregulated and you can use as much as you want.
3. With the exception of building entrances, determine the allowed lighting power for each application by multiplying the area in plan by the allowed lighting power density for the lighting zone of the property. Only one lighting power allowance can be claimed for any area.
4. Count up the number of building entrances and multiply by the allowance per entrance.
5. Add all of the values calculated in (3.) and (4.). The actual lighting rated lamp watts must be equal to or less than this sum.

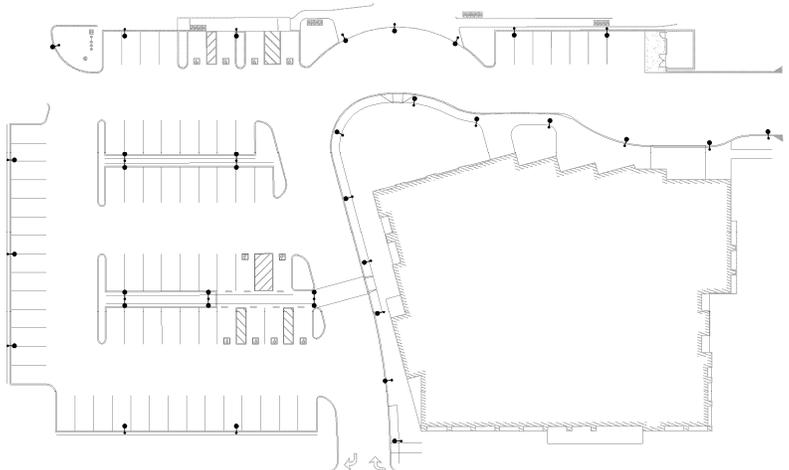
Table 2
 ALLOWED LIGHTING POWER
 (watts per square foot (w/ft²) unless otherwise noted)

Lighting Application	Allowed Area	LZ 0	LZ 1	LZ 2	LZ 3	LZ 4
Hardscape	Watts per square foot of paved or improved area	0.04	0.06	0.08	0.1	0.2
Building entrances	Per Door (stated values are watts, not watts per square foot).	13	18	26	32	70
Building entry, drive-up sales, and general use canopies	Drip line area under canopy.	0	0.1	0.2	0.4	0.7
Vehicle Service Station Canopy	Drip line area under canopy	0	0.30	0.60	1.2	2.4
Outdoor Sales, Service or Industrial Lot	Portion of uncovered hardscape used exclusively for display of vehicles or other merchandise for sale, for the service of vehicles, aircraft or watercraft, or for exterior manufacturing.	0	0.25	0.45	0.9	1.8
Ornamental Lighting	Entire site	0	0	0.01	0.02	0.04
Landscape Lighting	Landscaped area	Exempt	Exempt	Exempt	Exempt	Exempt
Building Façade Lighting	Non-Residential and Multiple Dwelling	Exempt	Exempt	Exempt	Exempt	Exempt
ATM Security Lighting	Within 5 feet of ATM facility	Exempt	Exempt	Exempt	Exempt	Exempt
Flagpole lighting	Illuminating flags on flagpole	Exempt	Exempt	Exempt	Exempt	Exempt

Example: An office building in LZ3 has a parking lot, driveways and sidewalks with two main entrances (4 doors each), a loading dock with door and two emergency exits. Using AutoCAD, the paved area is 48,000 square feet.

The allowed power is
 $48,000 \text{ sf} \times .1 \text{ w/sf} = 4,800 \text{ watts}$
 $11 \times 32 = 352 \text{ watts}$
 Total Allowed = 5,152 watts

The design has (35) 100 watt pole lights and (16) 26 watt wall lights. The design is 3,916 and meets the ordinance.



Exempt Lighting and Street Lighting

Most lighting can be designed and implemented within the explicit terms of the Ordinance. But there are a few special cases that can't, and need to be addressed in special ways.

Exempt Lighting

The following lighting systems are generally not regulated. However, if they are used in lieu of regulated lighting to circumvent the ordinance, there may be ramifications:

- a. Interior lighting.
- b. Temporary lighting for theatrical, television, and performance areas.
- c. Lighting in swimming pools and other water features governed by Article 680 of the National Electrical Code.
- d. Code required exit signs.
- e. Lighting specifically for stairs and ramps.
- f. Temporary and seasonal lighting provided that individual lamps are 10 watts or less.
- g. Lighting required and regulated by the Federal Aviation Administration, U.S. Coast Guard or other federal or state agency.

In addition, sign lighting is not regulated in this section, but it regulated under the Sign Ordinance.

Street Lighting

Developers are generally responsible for installing street lighting before turning streets over to the (authority). New Street Lighting systems are required to meet the requirements of the Ordinance. In general:

- In Lighting Zone 2 and above, lighting is provided for all streets and roads

Lighting levels in all applications must meet requirements contained in Table 3 of the Ordinance. Note that these lighting levels are much lower than many current installations, and will require lower wattage lamps than in the past. In addition, fully shielded luminaires are required with internal house side shielding in most situations.

Sample Lighting Installations

Sample Compliant Lighting Installations for the Night Vision Device Influence Area Gas Stations

In lighting a gas station, there are three main areas to be considered; lighting under the pump canopy, lighting around the convenience store or office, and lighting for the apron areas including drives, parking and service areas that aren't under the canopy, such as air or water stations. For lighting under the canopy, the most basic design is a grid of metal halide downlights. Use flat lens fixtures, evenly spaced, with the maximum allowed "fully shielded" lamp watts. Employ 2 luminaires per car to meet IESNA recommended light levels, but fewer fixtures may be considered for conservation purposes.

Apron lighting should be performed using fully shielded pole luminaires, with the mounting height generally 20 feet or less. Lighting "in" from the perimeter is normally used to keep poles away from the drive areas. Using the maximum lamp watts allowed for fully shielded luminaires, lay-out type III distribution luminaires with a least 300-500 square feet of apron (not under canopy) per fixture.



Figure 1 - (Left) Gas station with fully shielded lighting and (right) with ordinary drop lens lighting. The reduced glare and light pollution of fully shielded lighting is required by the Ordinance (*Benya Lighting Design*)



Figure 2 - detail of fully shielded canopy lighting (*Monrad Engineering, Inc.*)

Note: because recommended light levels for service areas are much higher than for ordinary parking, it may be necessary to put two or more fixtures on each pole to reduce the number of poles.

Lighting for the building needs to be coordinated with lighting for the apron. In general, the apron lighting will meet the safety and security needs of the building, so additional lighting will generally be limited to a compact fluorescent fixture at each door. Special lighting should be provided for ATMs on site.

Figure 3 - Every Other Row Option Parking Lot with Fully Shielded Luminaires (*Monrad Engineering, Inc.*)



Large area - pole mounted

To light a large area such as a parking lot, there are two very important “rules of thumb” design options:

- **All Rows Option** Luminaires atop 17-20 foot poles must be mounted at every bumper line (about 65-70 feet across) and 50-80 feet on center. Single-headed luminaires should be used around the edge of the lot with double-headed luminaires in the center. Employ flat lens fixtures with type III distribution and use the maximum allowed lamp watts.
- **Every Other Row Option** Luminaires atop 35 foot poles should be mounted at every other bumper line (about 120-130 feet) and 80-100 feet on center. Employ 2 luminaires per pole at the edge and use four luminaires per pole in the center. Employ flat lens fixtures with type III distribution and use the maximum allowed lamp watts.

High pressure sodium lamps produce more lumens per watt than metal halide, and have better lumen maintenance. However, metal halide lamps have superior color and appear brighter. Choose between these lamps depending on project conditions.

Decorative Lighting



Figure 4 - Fully shielded high performance decorative lighting. *Top*, flat lens wall lanterns (Lumec); *Bottom*, post luminaire (GE)

Lanterns, sconces and other types of luminaires are often mounted on buildings to light doorway areas as well as to reinforce an architectural style. In other cases, traditionally styled globes and "acorns" are mounted atop poles or posts. Unfortunately, most traditional luminaires are unshielded and create a great deal of glare and light pollution. The Ordinance restrictions permit traditional luminaires but depending on shielding, the lamp watts are often very restricted. For this reason, it's probably best to avoid using unshielded or semi shielded decorative lighting, especially for area lighting on posts or poles.

If decorative lighting is very important to the design, investigate the new generation of fully shielded decorative lighting. The lamp is hidden in the top of the luminaire and casts light downward, but the shape of the luminaire is still traditional. There are a number of styles and periods available, making good lighting for these projects possible while maintaining a traditional or historic daytime appearance. Using pole lights of this type, follow the design suggestions for street lights or parking lots.

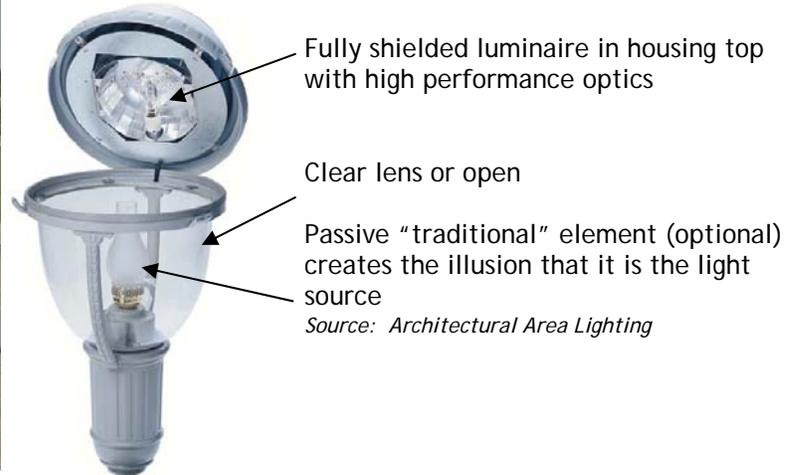


Figure 5 - Anatomy of a high performance decorative "fully shielded" luminaire

Externally lighted billboards and signs

To minimize impacts to the environment, it is necessary to light billboards and signs “top down” with full shielding. Good results can be obtained with either linear fluorescent or several HID luminaires designed with the special wide throw needed for signs. Most manufacturers provide good information on how to use their products. However, maximum lamp watts are regulated, which will tend to favor fluorescent systems in Zones 1 and 2.



Figure 6 - Several luminaires for top lighting of building signs



Figure 7 - Top Mounted, fully shielded sign luminaires. Note shielding in the direction of the viewer is critical as well as shielding for potential spill light over the top of the sign (*Monrad Engineering Inc.*)

Sports Lighting

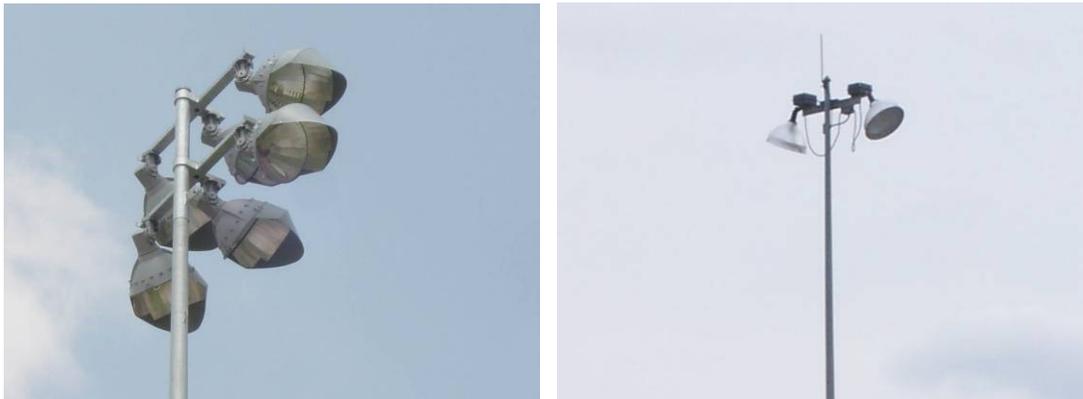
Sports lighting causes such significant light pollution that extra care must be taken in designing, installing, aiming and maintaining sports lighting systems. Sports lighting should use the tallest practical poles and luminaires should be aimed mostly downward. Because high light levels must be used even in the most sensitive lighting zones, there are no lamp wattage limits, and most systems will use metal halide lamps up to 2000 watts. Instead, the use of sports lighting will be limited to sports applications, and hours will be strictly limited.



Figure 8 - A Tale of Two Ballparks. *Left* Ordinary unshielded sports lighting *Right* State of the art sports lighting (Monrad Engineering, Inc.)

In addition, designers should seek modern sports systems with sophisticated shielding and avoid low cost systems that tend to be extremely glaring. A simple top shield does not do much. A new generation of extremely well shielded sports products is now available, and to meet the intent of the Ordinance, their use is required.

Figure 9 -*Left* State of the Art Sports Lighting (Musco) *Right* generic unshielded sports lighting



(Musco and Benya Lighting Design)

Roadway/Highway



The largest cause of light pollution is roadway lighting. Even if the light is properly shielded, the light reflected by pavement and cars is significant. So as a preliminary consideration, always ask the question whether lighting is really required. There are many streets and roads that don't require lighting; there are others that require lighting at intersections but not continuously. The Ordinance includes regulations for new developments and streets, including "when to light" and appropriate light levels.

It is common for municipalities and utility companies to have "standard" lighting systems and performance requirements. Many of these employ improperly shielded lighting and/or overly high wattage lighting. These standards should be revised as quickly as possible to meet the Ordinance. For existing street lighting, there is huge potential to reduce overall light pollution by changing existing systems to conform with the Ordinance, especially if light level and watts are reduced.



Note that street light design using "full cut off" luminaires is required by the Ordinance. For maximum energy efficiency and minimum maintenance, high pressure sodium lighting is generally preferred. Pole height is not restricted, but as a general rule street lights should be between 20 and 35 feet above grade. Poles are generally mounted 5-6 mounting heights apart along the roadway.

For reasons of cost and maintenance, the most common street lights are "cobra head" style, and both traditional and upscale designs are available in fully shielded flat lens types. For downtown streets and historic districts, consider using decorative fully shielded luminaires as their performance is similar.



Figure 10 - Street and Roadway lighting systems (Monrad Engineering, Inc. and AAL)

Landscape and Façade Lighting

The ordinance treats these two types of lighting similarly. Both generally are mounted on the ground and light upwards, an obvious concern for controlling light pollution. Neither façade lighting nor landscape lighting are permitted in lighting zones LZ0 and LZ1a, but in all other zones the use of low voltage landscape lighting up to 50 watts is not restricted. For most applications, this is plenty of lighting for trees and landscape features, as well as being affordable and attractive. Also note that path lighting can use fully shielded lights, even though they are not required. High wattage landscape lighting and façade lighting is only permitted in lighting zones 3 and 4, limited to 100 watts in lighting zone 3 and 250 watts in lighting zone 4.



Figure 11- Installations using high wattage floodlights are only allowed in lighting zones 3 and 4. (Left) building façade lighting and (right) commercial landscape lighting (Kim Lighting)



Figure 12 - Lighting equipment for accent lighting (left) above grade PAR (center) above grade low voltage MR16 (right) high wattage HID (Hydrel)

Pedestrian and Walkway Lighting

Like street lighting, there are many situations where no lighting or only occasional lighting is required. As a general rule, first evaluate whether continuous lighting is actually required. Once lighting is determined to be needed, use pole lights or bollards meeting the design conditions. Note that the height of pole lights is limited and for all luminaires, lamp watts are limited by lighting zone and shielding.



Figure 13- Walkway lighting with (*left*) bollards and (*right*) short pole lights (AAL)

The most common choice is often between bollards and short poles (<12'). With current technology, a wide variety of fixture choices are available meeting the Ordinance's "fully shielded" and "shielded" requirements. In lighting zones 3 and 4 it may also be possible to provide some lighting using ornamental, unshielded luminaires, although the watts are restricted.

Lighting for Monuments, Flagpoles, and Public Art

There are a number of special cases where the basic lighting regulations don't work. In the case of poles flying the Flag of the United States, when the Flag flies at night it is to be lighted. Such lighting is not permitted in Lighting Zone 0, but is permitted in all other lighting zones. Because only a small amount of the light actually illuminates the Flag, the amount of power is limited to 40 watts in lighting zone 1A and to 70 watts in zones 1-4. There are other exemptions such as lighting for ATM machines, because lighting for these machines is frequently controlled by banking laws.



Figure 14 - Lighting for Public Art, Monuments, and Statuary is allowed but a special permit is required to ensure that the lighting is designed to mitigate light pollution (*Hydrex*)

Monuments and public art including statuary, bridges and other important community structures are among a number of lighting situations where lighting is needed and can't meet the more stringent requirements for more ordinary projects. For these situations, a formal special permitting process is provided. Applicants must demonstrate that the lighting is appropriate and designed to mitigate light pollution. Communities are encouraged to hire consultants to check the designs for compliance.

Note: a list of lighting manufacturers approved by the International Dark Sky Association is available at <http://www.darksky.org/mc/page.do?sitePageId=56423&orgId=idsa>

Draft Amendment to the International Code Council's 2003 International Building Code

The draft building code amendment presented below is a variation on noise insulation standards in effect in California (California Administrative Code, Title 25, Article 4). The draft building code amendment has been numbered to allow easy incorporation into the 2003 International Building Code. The amendment includes single-family dwellings as well as nonresidential structures used for noise-sensitive activities and provides standards for soundproofing against noise and other sources of community noise.

Section 1211 Sound Attenuation Standards - Aircraft Noise

1211.1 Purpose

The purpose of these standards is to establish uniform minimum noise attenuation performance standards to protect persons within hotels, motels, apartment houses, attached and detached single-family dwellings, and other noise-sensitive activities within structures from the effects of excessive noise, including but not limited to hearing loss or impairment and persistent interference with speech and sleep.

1211.2 Application and Scope

The provisions of this article relating to noise attenuation performance standards apply to all applications for building permits made subsequent to the effective date of these regulations for new or redeveloped hotels, motels, dwellings, and other structures used for noise-sensitive activities.

1211.3 Definitions

The special terms used in this section are defined as follows:

Day-Night Average Sound Level (DNL)

A method for describing the estimated cumulative aircraft or other noise exposure that affects communities. The DNL metric represents decibels of noise as measured by an A-weighted sound-level meter. In the DNL procedure, noise exposures are accumulated for a typical 24-hour period. Daytime and nighttime noise exposures are considered separately. A weighting factor equivalent to penalty of 10 decibels is applied to aircraft operations or other noise sourced between 10 p.m. and 6:59 a.m. to account for the increased sensitivity of people to nighttime noise. The DNL values can be expressed graphically on maps using either contours or grid cells.

Decibel (dB)

A unit for measuring the volume of a sound, equal to the logarithm of the ratio of the sound intensity to the intensity of an arbitrarily chosen standard sound.

Noise

Any sound that is undesirable because it interferes with speech and hearing, or is intense enough to damage hearing, or is otherwise annoying.

Noise Contours

Lines drawn on a map that connect points of equivalent DNL values. They are usually drawn in 5-DNL intervals, such as connections of DNL 75 values, DNL 70 values, DNL 65 values, and so forth.

Noise Grid

Squares or “cells” of equal size superimposed over a base map of an airport or other noise source and its environs. Numbers printed in each grid cell represent the DNL value of noise at the center of the square for a particular year being studied. Several numbers representing several years can also be displayed. Grid cells may be of any size, depending on the study area. Usually, a cell of about 1,000 feet to 1,400 feet per side (23 to 45 acres) is used for purposes of noise analysis and land use planning.

Noise-Sensitive Activities in Nonresidential Structures

Activities in office buildings, offices within other types of structures, research facilities, meeting rooms, and similar activities in structures not intended for residential or transient lodgings. Such uses and activities could be affected by high levels of exterior noise that penetrate into interior spaces.

Redeveloped Structure

Renovations of existing structures when the cost modification is 50% or more of the value of the original structure at the time the renovation is to begin.

Residential Structures

Any structure for the purpose of housing occupants either on a permanent or transient basis. Residential structures shall include, but shall not be limited to, detached single-family dwellings, attached single-family dwellings (townhouses and patio homes), boarding and rooming houses, mobile homes, manufactured or prefabricated houses, apartment houses (single-story or multistory), motels, and hotels.

1211.4 Noise Insulation from Exterior Sources**1211.4.1 Location and Orientation**

Consistent with land use standards, residential structures or nonresidential structures used for noise-sensitive activities located in noise-critical areas shall be designed to prevent the intrusion of exterior noises beyond prescribed levels with all exterior doors and windows closed. Noise-critical areas are those near (a) airports; (b) county roads, city streets, and freeways; (c) railroads; (d) rapid transit lines; or (e) industrial areas. Proper design shall include, but shall not be limited to, orientation of windows or other openings in structures away from the noise source, setbacks, shielding, and sound attenuation of the building itself.

1211.4.2 Interior Noise Levels

Interior day-night average sound level (DNL) attributable to exterior sources shall not be exceed an annual DNL 45 in any habitable room with windows closed.

1211.4.3 Community Determination of DNL Contours and Grid Cells

The local jurisdiction shall prepare or shall have prepared a map showing DNL contours or grid cells for the areas exposed to noise levels of DNL 65 or higher from the sources specified in Section 1211.4.1. In the case of civil and military airports, the airport operator shall be responsible for preparing or have prepared a map of such contours or grid cells.

1211.4.4 Airport Noise Source

An acoustical analysis shall be required for new or redeveloped residential structures or nonresidential structures used for noise-sensitive activities located in areas where the exterior noise level due to aircraft operations is DNL 65 or higher. The acoustical analysis shall show that the structure or rooms in which the noise-sensitive activity takes place has been designed to limit intruding noise to the allowable interior noise level prescribed in Section 1211.4.2.

1211.4.5 Vehicular and Industrial Noise Sources

An acoustical analysis shall be required for new or redeveloped residential structures or nonresidential structures used for noise-sensitive activities located in areas where the exterior noise level due to vehicular noise or industrial operations is DNL 65 or higher. Vehicular noise of DNL 65 or higher can occur in the vicinity of an existing or adopted freeway, express-way, major street, thoroughfare, railroad, or rapid transit line. The acoustical analysis shall show that the structure or rooms where the noise-sensitive activity takes place has been designed to limit intruding noise to the allowable interior noise level prescribed in Section 1211.4.2.

1211.5 Compliance

1211.5.1 Evidence

Evidence of compliance shall consist of an acoustical analysis report, prepared under the supervision of a person experienced in the field of acoustical engineering, with the application for building permit. The report shall show the following: (a) topographical relationship of noise sources and dwelling or activity site; (b) identification of noise sources and their characteristics; (c) predicted noise spectra at the exterior of the proposed structure considering present and future land use; (d) basis for the prediction (measured or obtained from published data); (e) noise attenuation measures to be applied, if any; and (f) an analysis of the effectiveness of the proposed construction showing that the prescribed interior noise-level requirements are met. If interior noise levels are met by requiring that windows be unopenable or closed, the design for the structure must also specify the means that will be employed to provide ventilation, and cooling if necessary, to provide a habitable interior environment.

1211.5.2 Field Testing

Field testing may be required only when inspection indicates that the construction is not in accordance with the approved design. Interior noise measurements shall be taken under conditions of typical maximum exterior noise levels within legal limits. A test report showing compliance or noncompliance with prescribed interior allowable levels shall be submitted to the Building Official.

If a field test is required to resolve a complaint of noncompliance with these standards, the complainant shall post a bond or adequate funds in escrow for the cost of the test. If the field test shows compliance, the cost of the test shall be borne by the complainant. If the field test shows noncompliance, the cost of the test shall be borne by the owner or builder.