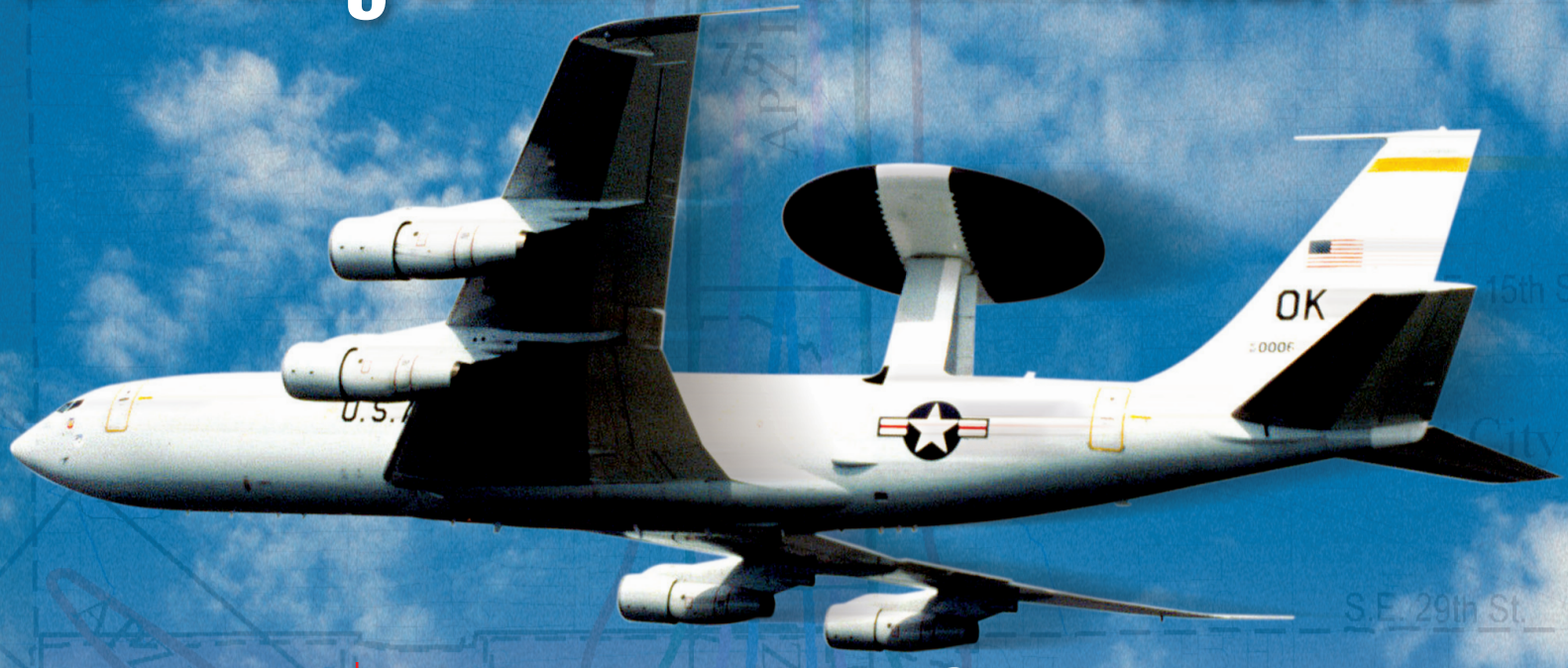
Defending Oklahoma's Future: Tinker AFB



Joint Land Use Study

Prepared for

Midwest City, Del City, Oklahoma City, Spencer, Choctaw, Nicoma Park, Oklahoma County, Cleveland County, Oklahoma Strategic Military Planning Commission, Tinker AFB

acog

Association of Central Oklahoma Governments

Submitted by

DFW Advisors Ltd.

with Michael R. Coker Company and Pavlik and Associates

September 2008

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Defending Oklahoma's Future: Tinker AFB Joint Land Use Study

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Association of Central Oklahoma Governments
21 E. Main Street, Suite 100
Oklahoma City, OK 73104-2405
(405) 234-2264 / FAX (405) 234-2200
Internet: www.acogok.org
E-mail: acog@acogok.org

U.S. Department of Defense, Office of Economic Adjustment

Submitted by

DFW Advisors Ltd. with Michael R. Coker Company and Pavlik and Associates

September 2008

This study was prepared under contract with the Association of Central Oklahoma Governments, with financial support from the Office of Economic Adjustment, U.S. Department of Defense. The content does not reflect the views of the Office of Economic Adjustment.

Abstract

TITLE:	Tinker Air Force Base Joint Land Use Study
POINT OF CONTACT:	Holly Massie, Special Programs Officer, ACOG
DATE:	September 2008
SUBJECT:	The Joint Land Use Study was an initiative of Del City, Midwest City, Oklahoma City, Spencer, Nicoma Park, Choctaw, Oklahoma County, Cleveland County, the Oklahoma Strategic Military Planning Commission and Tinker Air Force Base (AFB). The U.S. Department of Defense, Office of Economic Adjustment provided project oversight and the Association of Central Oklahoma Governments served as the study sponsor. The purpose of this Joint Land Use Study was to evaluate the current status of the implementation of recommendations issued in the 2006 Air Installation Compatible Use Zone Study for Tinker AFB and to make recommendations for additional actions by local governments designed to improve land use decisions that may affect the missions of Tinker AFB.
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PREAMBLE

The mission of the United States Air Force is to deliver sovereign options for the defense of the United States of America and its global interests—to fly and fight in Air, Space, and Cyberspace. To achieve that mission, the Air Force has a vision of Global Vigilance, Reach and Power. That vision orbits around three core competencies: Developing Airmen, Technology-to-Warfighting and Integrating Operations. (Tinker AFB Website)

This Joint Land Use Study (JLUS) was an initiative of Midwest City, Del City, Oklahoma City, Spencer, Choctaw, Nicoma Park, Oklahoma County, Cleveland County, the Oklahoma Strategic Military Planning Commission and Tinker Air Force Base (AFB). The Association of Central Oklahoma Governments served as the study sponsor. The purpose of the JLUS was to evaluate the current status of the implementation of recommendations issued in the 2006 Air Installation Compatible Use Zone Study for Tinker AFB and to make recommendations for additional actions by local governments designed to improve land use decisions that may affect the missions of the Base. The objective of the consulting team hired to prepare this assessment is to recommend actions that will improve the compatibility of land uses around Tinker AFB now and in the future.

DFW Advisors
Michael R. Coker Company
Pavlik and Associates

What is ACOG?

The Association of Central Oklahoma Governments (ACOG) is a voluntary association of city, town and county governments within the Central Oklahoma area. The current membership includes 32 local governments and Tinker Air Force Base as an associate member. The ACOG region includes Oklahoma, Cleveland, Canadian and Logan Counties, which surround the state capital, Oklahoma City.

ACOG's purpose is to aid local governments in planning for common needs, cooperating for mutual benefit and coordinating for sound regional development. ACOG helps its member entities work in partnership to address issues common to many jurisdictions. This serves to strengthen both the individual and collective capabilities of local governments.

ACOG was originally established in June 1966. It is governed by a Board of Directors, which makes all policy decisions for the organization. Each member government appoints to the ACOG Board a representative and up to two alternates from its elected officials. Member entities exercise a weighted vote, which is based on their most recent population estimates.

Contact Information:

Association of Central Oklahoma Governments
21 E. Main Street, Suite 100
Oklahoma City, OK 73104-2405
(405) 234-2264 / FAX (405) 234-2200
Internet: www.acogok.org
E-mail: acog@acogok.org

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- *Commissioner* — *Phil Carson*
- *Commissioner* — *Don Young*

CLEVELAND COUNTY
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LOGAN COUNTY
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OKLAHOMA COUNTY
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- *Commissioner* — *Ray Vaughn*

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- *Tinker Air Force Base*

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- *John G. Johnson*

JLUS Policy Committee Members and Alternates
July 2008

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Roger Malone	Councilmember	City of Choctaw	Member
Randy Ross	Mayor	City of Choctaw	Alternate
George Skinner	Commissioner	Cleveland County	Member
Denise Heavner	County Assessor	Cleveland County	Alternate
Brian Linley	Mayor	City of Del City	Member
Dick Carter	Councilmember	City of Del City	Alternate
Russell Smith	Mayor	City of Midwest City	Member
James L. Ray	Councilmember	City of Midwest City	Alternate
Kevin Loudermilk	Councilmember	City of Nicoma Park	Member
Theron Franks	Councilmember	City of Nicoma Park	Alternate
Pete White	Councilmember	City of Oklahoma City	Member
Sam Bowman	Councilmember	City of Oklahoma City	Alternate
Brent Rinehart	Commissioner, Dist. 2	Oklahoma County	Member
Willa Johnson	Commissioner, Dist. 1	Oklahoma County	Alternate
Earnest Ware	Vice Mayor	City of Spencer	Member
James C. Talley	Councilmember	City of Spencer	Alternate
Unfilled position		Okla. Strategic Military Planning Commission	Member
Col. Mona Lisa Tucker	72 ABW/Vice Commander	Tinker Air Force Base	Ex-Officio
Gene Gallogly	Director, Base Civil Engineer	Tinker Air Force Base	Ex-Officio

JLUS Technical Work Group Members and Alternates
July 2008

Name	Title	Entity	
Mark Seibold	City Planner	City of Choctaw	Member
Robert Floyd	City Manager	City of Choctaw	Alternate
Dan Cary	Emergency Mgmt. Director	Cleveland County	Member
Robert Wood	Building Engineer	Cleveland County	Alternate
Tom Leatherbee	City Planner	City of Del City	Member
Billy Harless	Community Develop. Dir.	City of Midwest City	Member
Ron Green	Current Planning Mgr.	City of Midwest City	Alternate
Jim Pumphrey	Mayor	City of Nicoma Park	Member
Beverly McManus	City Clerk	City of Nicoma Park	Alternate
Susan MIller	Planner IV	City of Oklahoma City	Member
Aubrey Hammontree	Planner III	City of Oklahoma City	Alternate
Tyler Gammon	Planning Director	Oklahoma County	Member
Ruth Walters	Planner	Oklahoma County	Alternate
Louis Smitherman	City Manager	City of Spencer	Member
Bill Dalke	Community Planner	Tinker Air Force Base	Ex-Officio
LouAnna Munkres	Community Planner	Tinker Air Force Base	Ex-Officio

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EXECUTIVE SUMMARY

History on display
The Major Charles B. Hall Memorial Airpark is a site open to the public.

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Executive Summary
September 2008

Introduction

The Joint Land Use Study (JLUS) embodied in this report is a cooperative land use planning initiative among communities in Central Oklahoma designed to promote community growth and development that is compatible with the present and future training and operations missions of Tinker Air Force Base (the Base). The JLUS identifies ways in which the surrounding communities can work individually and collectively to prevent future encroachments near the Base that could hamper its long term viability and military preparedness for America's responsibilities.

The Study Partners

The Association of Central Oklahoma Governments (ACOG) served as the study sponsor. ACOG is a regional planning agency established under the authority of Title 74, Oklahoma Statutes (1971), Sec. 1001-1008a. Under this authority, ACOG is an extension of state and local government and is the recipient of study funding from the U.S. Department of Defense, Office of Economic Adjustment (OEA). The JLUS also benefits from guidance and oversight by OEA. Other project funders are the Oklahoma Strategic Military Commission and the study partners of Choctaw, Del City, Midwest City, Nicoma Park, Oklahoma City, Spencer, Cleveland County and Oklahoma County as well as Tinker Air Force Base.

2006 AICUZ Study for Tinker Air Force Base

The JLUS was preceded by the Air Installation Compatible Use Zone Study (AICUZ) conducted by the Base in 2006. The AICUZ program was established by the Department of Defense to promote compatible land use around military airfields. The military services maintain an AICUZ

program in an effort to protect the operational integrity of their flying mission. The purpose of an AICUZ is to promote public health and safety through the local adoption of compatible land use controls and to protect the operational capability of the military installation.

Included in the study are land use compatibility guidelines based on noise exposure zones, Accident Potential Zones (APZ), and obstructions to air navigation. According to the study, portions of the Clear Zones (CZ), APZ I and APZ II for Tinker's north-south and crosswind runways are located within the cities of Midwest City, Del City and Oklahoma City. (See figure on pg 10.) The most recent Day-Night average sound levels of 65 decibels or greater impact these communities plus the City of Spencer. Nicoma Park and Choctaw lie beneath the Base's flight tracks.

JLUS Components

With the AICUZ Study as its foundation, the JLUS provides a framework for surrounding communities to support, in a next phase, adoption and implementation of compatible development standards. Components of the JLUS are:

- Data collection, inventory and mapping of codes, land use, zoning and future development plans that have been adopted by each of the affected areas
- Comparison of the surrounding communities' development patterns, adopted regulations and building codes with the 2006 AICUZ Study recommendations
- Evaluation of the differences among the surrounding communities' adopted development regulations and building codes concerning noise, height and development within areas affected by the AICUZ APZs and noise contours
- Analysis of current and potential land use and air facility conflicts

Named by the ACOG Board of Directors to the JLUS Policy Committee were 20 persons including elected officials from each participating jurisdiction, the Oklahoma Strategic Military Planning Commission and Tinker AFB. The Policy Committee assumed responsibility for the overall direction of the study effort including development of the study design and work program, selection of a consultant, and receipt of the report and policy recommendations.

The JLUS Technical Work Group, made up of planners and engineers on the staffs of the jurisdictions and Tinker AFB, assumed responsibility for technical review of the report drafts. DFW Advisors of Dallas, TX was the prime consultant; also on the team were key persons from Michael R. Coker Company of Dallas, TX and Pavlik and Associates of Fort Worth, TX. ACOG, together with the consultant team, led extensive community outreach efforts in development of the JLUS report.

The Study Area

The study area (see figure on pg. 10) includes parts of six cities and two counties. They are: Choctaw, Del City, Midwest City, Nicoma Park, Oklahoma City, Spencer, Oklahoma County and Cleveland County.

Choctaw is located in the geographic center of Eastern Oklahoma County. This city has a total area of 27.1 square miles and a population of 10,803 according to the 2006 census estimate. Choctaw borders Nicoma Park to the West and lies approximately nine miles northeast of Tinker AFB.

Founded in 1948, Del City has a total area of 7.5 square miles within Oklahoma County. The population was 21,904 at the 2006 census estimate. Tinker AFB is located east and southeast of Del City across Sooner Road.

Founded in 1942, Midwest City lies within Oklahoma County. As of the 2006 census, the city had a total population of 55,161 and is the seventh largest city in the state. Midwest City is 25 square miles and the southern corporate limit line borders Tinker AFB.

Nicoma Park contains 3.3 square miles within its boundaries and has a population of 2,377, according to the 2006 Census Bureau estimates. Nicoma Park is also located within Oklahoma County. The city lies approximately 6.2 miles northeast of Tinker AFB.

Oklahoma City is the state capital and county seat of Oklahoma County, and portions of the city extend into three other counties. According to the Census Bureau's 2006 population estimates, the city is the 30th largest in the U.S. with an estimated population of 537,734. Tinker AFB is located in Oklahoma City and borders the Base on the west, south and east sides.

Spencer is approximately 10 miles from downtown Oklahoma City and shares borders with the City of Nicoma Park, to the east, and the City of Midwest City, to the south. The city has a total area of 5.3 square miles with a population of 3,918 at the 2006 census estimate. Spencer is located approximately 5.5 miles north of Tinker AFB.

Oklahoma County was one of the original seven counties in Oklahoma organized by Congress in 1890. Located in the center of the State, Oklahoma County has a population of more than 650,000 residents located in an area of 720 square miles.

Cleveland County is located south of Tinker AFB and had an estimated population in 2006 of 228,594. Its County Seat is Norman, and it has an area of 558 square miles.

The combined estimated population of the greater Oklahoma City metropolitan area is 1,192,989.

General Recommendations

A major obstacle to the continued development of the Base and the local area could be unabated growth and development without recognition of the possible consequences. This report provides a comprehensive plan for correction of current encroachments, procedures for avoiding future encroachments, and recommendations for future compatible land use, as well as enhancing communication strategies. Recommended options which should be adopted for action by all of the study's partners include:

- Creation of an oversight committee with representation from all partnering jurisdictions to monitor changes and relationships and to work closely with the Base on land use and encroachment issues. Each city and each entity, along with many of the organizations affiliated with Tinker, have their own relationship with the Base but there is no overall coordinating system to make sure that all entities—public and private—working with the Base are in sync with each other.

- Guarding against urban encroachment by providing detailed information regarding proposed development plans and future mission changes to the Base.
- Adoption of a strategy and protocol for ongoing communication between Tinker AFB and surrounding communities to apprise each other of potential development within AICUZ accident potential and noise zones.
- Review of flight path corridors by seeking Tinker AFB input on siting locations for public facilities, including schools, libraries, etc.

Area-Specific Recommendations

Recommendations specific to geographic areas/jurisdictions are divided into four categories: (1) land use policies; (2) real estate considerations; (3) building and construction guidelines, and (4) environment and transportation. More detailed information on each of these recommendations and the communities to which they apply are included in the full JLUS Report.

Land Use Policy Recommendations

- Modify comprehensive plans and zoning ordinances to minimize incompatible land uses around the Base, particularly within the AICUZ accident potential zones.
- Establish land use policies against zoning land to any category permitting residential development within the 75 dB DNL or higher noise contour, or within the 65-74 dB DNL contour unless sound attenuation will be achieved.
- Ensure height and obstruction ordinances reflect current Air Force and Federal Aviation Administration (FAA) Part 77 requirements.
- Show APZs I, II and AICUZ noise contours on all adopted comprehensive plan maps and/or zoning maps.

Real Estate Considerations

- Consider purchase of land within the APZ I and 75+ dB noise contour as an alternative to regulatory methods for preserving land and minimizing the development of incompatible land uses.
- Create a voluntary acquisition program for residential properties and vacant land located within the APZ I areas.
- Develop a voluntary avigation easement program to allow the acquisition of easements to ensure land use compatibility of properties within the 65 dB DNL or greater noise contour.
- Consider purchase of a portion of land if needed to protect open space, sensitive, or critical areas within AICUZ noise contours and accident potential zones.
- Establish a transfer of development rights program to maintain public safety and mission sustainability where development rights currently exist.
- Allow land in APZs and 75+ dB DNL areas to be placed in a temporary holding status to be turned over for compatible development at a future date.
- Implement a real estate disclosure process for structures located within AICUZ noise contours and accident potential zones at the initial advertisement of property (e.g., Multiple Listing Service database).
- Adopt maximum densities for new development within AICUZ APZ I and II for various land uses. During the course of this study, extensive research and analysis resulted in the following recommendations in regards to density of new residential, commercial and industrial developments.
    - Commercial and industrial density: maximum of 25 people/acre in APZ I and 50 people/acre in APZ II
    - Residential density: no new dwelling units in APZ I and a maximum of four dwelling units/acre in APZ II

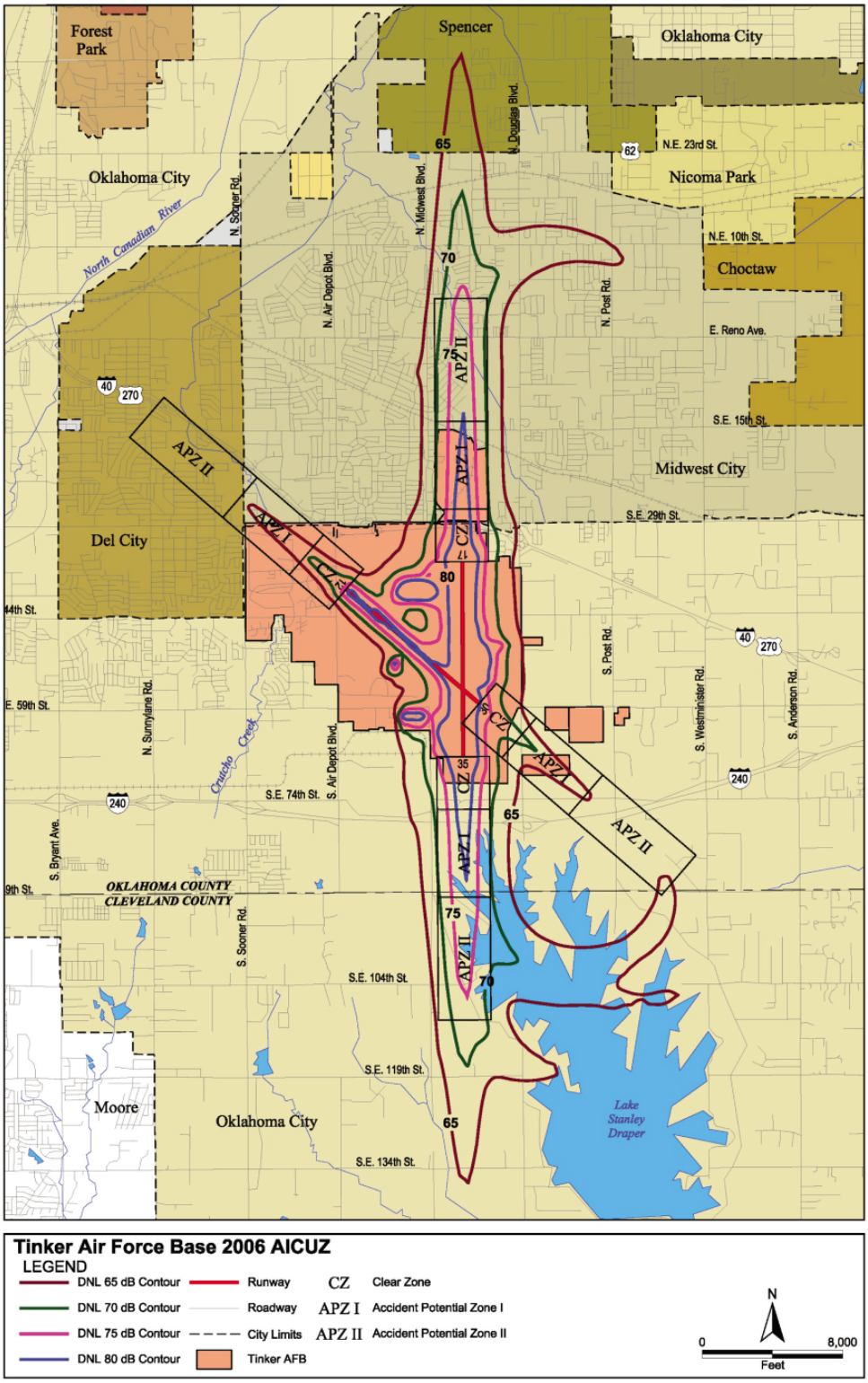
Building and Construction Guidelines

- Update building codes to continue to meet or exceed DoD recommendations for noise level reduction and the most recent version of the International Building Code.
- Develop a construction guide for builders, developers, architects and building inspectors to clarify noise compatibility guidelines and other requirements for building within accident potential or noise zones.
- Encourage existing structures and require new construction in the 65 dB DNL and higher to participate in a sound attenuation program. Once a structure complies with the program, certification should be awarded to the property owner and recorded along with all other property ownership records.
- Improve acoustic site design through positioning of new structures within AICUZ noise contours on a development site for the purpose of reducing noise levels in the most noise-sensitive buildings.

Environmental and Transportation

- Determine the feasibility of closing a portion of Douglas Boulevard related to development of the Maintenance Repair and Overhaul Technology Center (MROTC) and future needs for Tinker AFB expansion.
- Work with the state's agriculture department to help reduce the number of birds circling the landfills near Tinker AFB.
- Prohibit new sanitary landfill or wetland mitigation projects within 10,000 feet of aircraft runways.

Noise Contours and Accident Potential Zones
Tinker Air Force Base 2006 AICUZ Study



Source: Tinker Air Force Base 2006 AICUZ Study

SECTION I
Protection of the Base and its Neighbors

Midwest City
Midwest City properties focus on beautification.
Source: City of Midwest City.

1.1 Acronyms and Abbreviations

A-C	Arterial Commercial
AFB	Air Force Base
AICUZ	Air Installation Compatible Use Zone
APZ	Accident Potential Zone
CZ	Clear Zone
DoD	U.S. Department of Defense
FAR	Federal Aviation Regulations
FAR	Floor Area Ratio
JLUS	Joint Land Use Study
M-H	Mobile Home
NGO	Non Governmental Organization
OC-ALC	Oklahoma City Air Logistics Center
R-4	High Density Residential
SIC	Standard Industrial Classification Code
SLUCM	Standard Land Use Coding Manual

1.2 Statement of the Issues

Military installations must be able to conduct their various operations, including military training and testing mission requirements, while still taking into consideration the welfare of neighboring communities and protection of the environment. Most American military installations were established in rural areas, well away from major population centers, but their very presence became a catalyst for growth.

A booming population along with urban sprawl is causing military areas to be encroached upon by the nation's neighborhoods. As a decrease in open space between installations and developed areas occurs, the prevention of infringement on one another is more difficult to avoid. Growing metropolitan areas consume open space in ways that can hamper use of the area's natural resources and limit the effective use of the installations.

Development of areas near military installations can create friction points such as interference with air routes and communications due to construction of power lines, cell towers or other structures; more competition for data and communication frequencies; concerns expressed by adjacent locales about noise and safety; depletion of critical ground and surface water resources; increased air emissions threatening to exceed federal thresholds; and displacement of other life forms, including endangered species.

Encroachment adversely affects mission accomplishment by:

- Reducing the number of available training days
- Reducing training realism as tactics are modified (departure and arrivals routes, time of day, types of operations) to comply with local laws, safety requirements, and noise abatement procedures
- Causing modifications to facility access (temporary or permanent)
- Decreasing scheduling flexibility
- Increasing security demands

1.3 Tinker Air Force Base – Oklahoma City, Oklahoma

Tinker Air Force Base is a major U.S. Air Force installation located in Oklahoma City and adjacent to the communities of Midwest City and Del City, Oklahoma. The base currently employs more than 27,000 military and civilian employees as the largest single site employer in Oklahoma. The installation itself covers over 5,028 acres and has 697 buildings with a building floor space of over 16 million square feet to accommodate its many varied missions.

Meteorology documents Maj. Ernest J. Fawbush, left, and Capt. Robert C. Miller were the first in American history to forecast a tornado. (Air Force photo courtesy of Oklahoma City Air Logistics Center History Office)

In 1940, the Oklahoma City Chamber of Commerce purchased land at the city's airport to preserve it for aviation and military development. Later the Chamber, the City of Oklahoma City and the Civil Aeronautics Administration (CAA) signed an agreement to lease the land to the CAA, which is known today as the Federal Aviation Administration (FAA).

The Base originally opened as the Midwest Depot in 1941. On January 13, 1948, it was renamed in honor of Major General Clarence Leonard Tinker who was part Osage Indian. Tinker was the first Major General of American Indian descent in the U.S. Army. He was lost on a mission to Wake Island in 1942.

Tinker Air Force Base is the home of the Air Force Materiel Command, the Oklahoma City Logistics Center which is the worldwide manager for a range of aircraft engines, missiles, software, avionics, and accessories and components. It is one of three U.S. Air Force Logistic Centers. The host unit at Tinker is the 72nd Air Base Wing which provides support for the Oklahoma City Air Logistics Center (OC-ALC) and its various tenants.

In addition to the many Air Force missions, the U. S. Navy's Strategic Communications Wing ONE is the only one of its kind in the Navy. This Wing provides a vital, secure communications link to the submerged fleet of ballistic missile submarines. OC-ALC airframe artisans perform depot work on the Navy's E-6 Mercury airplanes while sailors perform field level work.

Tinker Air Force Base Missions

Oklahoma City Air Logistics Center

Combat Support Through People
War Fighter Support
Continuous Improvement

The OC-ALC is comprised of four wings that collaborate to ensure the overall success of the center. It is the largest ALC in the Air Force Materiel Command and provides depot maintenance, management expertise, services and supply chain management as well as installation, services and information support for 31 weapon systems, 10 commands, 93 Air Force bases and 46 foreign nations.

72nd Air Base Wing

- 72nd Medical Group
- 72nd Mission Support Group

The 72nd Air Base Wing (72 ABW) was activated at Tinker AFB, Oklahoma effective 1 October 1994. Its activation gave rebirth to the lineage and honors the history of a World War II combat organization that had earned Antisubmarine and American Theater campaign streamers.

76th Maintenance Wing

- 76th Aircraft Maintenance Group
- 654th Combat Logistics Support Squadron
- Propulsion Maintenance Group
- Commodities Maintenance Group
- 76th Software Maintenance Group
- 76th Maintenance Support Group

Mission Statement

Safely Deliver Air Power . . . Defect-Free Aircraft, Engines, Spare Parts and Software . . On time . . . On Cost . . . In Compliance With All Directives.

327th Aircraft Sustainment Wing

- 327th ASG (B-52 & Cruise Missile)
- 727th ASG (Contractor Logistics Support)
- 747th ASG (Combat Systems)
- 827th ASG (C/KC-135)

Mission Statement

The 327th Aircraft Sustainment Wing (ASW) organizes, directs and controls total life-cycle management of 94 B-52, 585 C/KC-135, 69

B-1 and 416 contractor logistics (including tanker, trainer, telemetry, airlift, command & control and US Presidential aircraft) aircraft. The 327th ASW is also responsible for all modifications & sustainment, including management and engineering of systems upgrades, acquisition of new systems, fleet support logistics, software maintenance, and programmed depot maintenance and supporting USAF, Reserve & Guard, sister service and numerous FMS forces.

448th Combat Sustainment Wing

- 448th Combat Sustainment Group
- 748th Combat Sustainment Group
- 848th Combat Sustainment Group
- 948th Combat Sustainment Group

Mission Statement

Supply chain management, including acquisition, repair, storage, distribution, disposal and the technical and engineering services, for the center's assigned engines and aircraft commodities. Support to Air Force, Army, Navy, Marine Corps, federal agencies and multiple foreign countries worldwide.

Tinker is also home to seven major U.S. Department of Defense, Air Force and Navy activities with critical national defense missions.

The 552nd Air Control Wing flies the E-3 Sentry aircraft and is part of the Air Force's Air Combat Command mobile strike force.

The Navy's **Strategic Communications Wing One** provides a secure communications link to the submerged fleet of ballistic missile submarines.

The **507th Air Refueling Wing** is an Air Force Reserve flying unit.

The **3rd Combat Communications Group** provides deployable communications, computer systems, navigational aids and air traffic control services anywhere in the world.

The **38th Engineering Installation Group** has worldwide responsibility for engineering and installation of all communications and electronic facilities for the Air Force.

The **Defense Distribution Depot Oklahoma** provides the receipt, storage, issue, inspection and shipment of material.

The **Defense Information Systems Agency Defense Enterprise Computing Center** operates computer systems for the Base and serves 172 other bases in all 50 states plus 92 foreign countries.

1.4 Role of the Department of Defense

The accelerating pace of urban development can potentially impact military operations and timely action is needed to protect the military's ability to test and train. To address regional land development, environmental issues and depletion of natural resources DoD is required to work with numerous governmental entities, private organizations and the public which requires ongoing cooperation, planning and partnerships among government and private organizations.

For decades DoD has encouraged compatible land use efforts. During the later 1940s and 1950s, the DoD built many military installations at least 10 to 15 miles from existing urbanized areas. To fulfill the needs of the employees and the logistical, supply, and construction needs of the military, these installations became employment centers. As local populations moved closer to the military installations, complaints about the effects of the military operations began to increase. Thus, the military began efforts to ameliorate the growing conflict between development and its missions. There is also increasing interest in environments that are home to sensitive and/or endangered species found adjacent to military installations.

The DoD has launched numerous efforts to promote compatible land use around military installations, each in conjunction with surrounding governmental entities. Programs such as the Air Installations Compatible Use Zones (AICUZ) were established in the 1970s. More programs have been authorized that promote conservation buffer partnerships. Efforts employed today to encourage compatible development around installations range from the Air Force's "greenbelt" program, durable compatible land use activities such as the AICUZ program, Joint Land Use Studies (JLUS) and other noise programs. For more info, please see http://www.denix.osd.mil/portal/page/portal/content/policy/DoD/dodi471513.pdf. In addition, Congress has made it easier to acquire conservation easements near military installations and ranges in partnership with non-governmental organizations (NGOs). The DoD's first activities to address land compatibility were mostly with Air Force installations but have since been utilized by all branches of the military.

1.5 Financial Support Corrects Conflicts

The citizens of Central Oklahoma have a long history of supporting the use of local funds (primarily county bond issues) to eliminate land use conflicts that could jeopardize the mission of Tinker AFB and/or jeopardize the safety of area citizens. Local efforts include:

- In 1973, Oklahoma County bond funds were used to purchase and clear approximately 836 single-family homes, 32 vacant lots and Glenwood Elementary School from the Glenwood Addition, which was located on the north side of SE 29th Street north of Runway 17/35, or the main runway, and east of Midwest Boulevard. The addition contained approximately 262 acres that were located within a portion of the runway's Clear Zone (CZ) and Accident Potential Zone I (APZ I) .

- In 1982, one of the largest churches in the State of Oklahoma was proposing to relocate to the northeast corner of SE 29th Street and Sooner Road in Midwest City, which lies within APZ I of the crosswind runway. Oklahoma County helped convince the church to acquire an alternate site and the new church was later constructed near SE 74th and Sooner.

- In 1986, public funds were used to acquire a 29-acre tract of land located northwest of the intersection of SE 29th Street and Sooner Road in Del City to prevent development of a shopping center within the APZ I of the crosswind runway.

- In 2002, Oklahoma County voters approved a bond issue for the purpose of acquiring 105 homes and five businesses located in the vicinity of Douglas Boulevard and I-40, near the main runway. These were homes located in the CZ and high noise contours of Runway 17/35 and some of the 1950's-era development was considered a security risk. The properties were purchased and cleared by 2006.

While these actions demonstrate commitment to Tinker AFB by Central Oklahoma's leaders and citizens, they also demonstrate that improved communication and coordination between the Air Force and the surrounding communities through the JLUS process could prevent potential conflicts at an earlier stage.

1.6 Specific Actions by Del City

Highlights of Del City's efforts to preserve and protect the Tinker AFB APZs as provided by city staff for this report include:

APZ I

- Rezoned Clanton Trailer Park (SE 29th and Sooner) from high density residential (Mobile Home Park / M-H) to much lower density commercial (Arterial Commercial / A-C). Rejected several uses, including a bank, a convenience store, and an automobile sales lot, all of which would have been a gathering point for large numbers of people.
- Condemned and is vacating large parts of the Kristie Manor Apartment Complex (SE 29th and Sooner). Property is intended for rezoning from high density residential (R-4) to much lower density commercial (Arterial Commercial / A-C).
- Worked with real estate agent to include specific information about APZ I land use and density restrictions in promotional materials for Tune Up Masters property (SE 29th and Sooner). Rejected several potential uses, including dry cleaner shop, convenience store, automobile sales lot, and child care center.

APZ II

- Drafted and adopted *Interim Development Regulations for Parcels within the Proposed APZ II of Runway 12/30, Tinker Air Force Base* on Nov. 19, 2007. Interim regulations include prohibition of incompatible uses, strict lot coverage and density standards, height restrictions stricter than FAR Part 77, restrictions related to attraction of nuisance wildlife, and other provisions designed to mitigate the impact of development that may occur within the APZ II zone before the conclusion of the JLUS study and until such a time as the City formally adopts the Runway 12/30 APZ II zone.
- Using Interim Regulations, drafted a Redevelopment Agreement for a large mixed use development to be located at the southwest quadrant of Sooner Road and I-40. The agreement requires no greater than 10% lot coverage, restricting uses that would be incompatible. Del City continues to attempt to negate any encroachment that could be caused by this development.

- Using Interim Regulations, denied occupancy clearances for two churches seeking to move into a building within the APZ II (South of SE 15th Street and Sunnylane).
- Using Interim Regulations, advised Mid-Del School District that expanding schools within the APZ II would not be permitted.
- The city purchased an existing gas station within the confines of APZ II under eminent domain and will remove this existing structure.

1.7 Specific Actions by Midwest City

The City of Midwest City has long supported Tinker Air Force Base through the adoption of Airport Zoning Regulations, regulation of Clear Zone and APZ-I areas, and delineation of Accident Potential Zones on Land Use Plans contained in several of the city's Comprehensive Plans. A history of the city's Airport Zoning regulations can be found on page 1-13 of this Section.

As previously noted, the city in conjunction with Oklahoma County facilitated the relocation of 836 single-family homes in Midwest City beginning in 1973. This major relocation of approximately 2,500 persons caused the city to lose its Community Development Block Grant entitlement status. If it hadn't been for Congressional intervention, the city would have lost approximately $750,000 per year between 1980 and 1990.

The relocation of these homes also had a significant effect on the economic base of the community. Many of the residents chose to relocate out of Midwest City, thus losing their purchasing power. The City's tax structure also was adversely affected with the loss of 836 homes that were no longer on the property tax rolls.

The 2002 bond issue also had an economic impact on the city. Several businesses were relocated as a result of the purchase of private property by Oklahoma County. Similar to previous acquisition efforts, the city has experienced losses in sales and property taxes.

Most recently Midwest City and Oklahoma City joined together to fund an engineering study of the current configuration of the Tinker/Air Depot gate. This study will identify alternative alignments which will address congestion issues at this location.

1.7.a Midwest City Comprehensive Plan

Beginning with its 1970 Comprehensive Plan, Midwest City has long recognized the importance of integrating the needs of Tinker Air Force Base with its planning efforts. In the 1970-1985 Comprehensive Plan, the City delineated two areas titled Tinker Air Force Base Approach Zones. These areas are shown on the Long Range Plan – 1985 map. Within the text of the Plan was the following narrative, "*Airport Approach Zones. It is intended that the airport approach zone of the north-south runway of Tinker Air Force Base be designated for open space uses that will not generate concentrations of people in the area located between SE 15th Street and SE 29th Street and 1,000 feet on each side of the extension of the runway center line. Relocation of housing, places of public assembly, and other conflicting uses is to be carried out on a phased basis as redevelopment becomes economically feasible*."

Midwest City
The success of commercial development is commensurate with the stability of the Base.
Source: City of Midwest City.

The 1970 Comprehensive Plan was updated in 1985 with the adoption of a new Comprehensive Plan. Many references to Tinker Air Force Base can be found in the 1985 Comprehensive Plan. For example, within the Community Analysis, four pages are devoted to the value and impact of Tinker Air Force Base to Midwest City. Later, in the Community Analysis in a subsection devoted to Physical Features of the community, there is additional commentary on Tinker.

> "*Midwest City has adopted an airport zoning ordinance to regulate land uses that may conflict with the operation of aircraft at Tinker Air Force Base. As a part of this ordinance two areas have been designated as APZs. As shown in Figure 4.1, one zone is located between Midwest Boulevard and Douglas Boulevard from SE 29th Street to SE 15th Street. The other zone is located near the intersection of Sooner Road and SE 29th Street. These two zones have been identified by Tinker Air Force Base to possess a significant risk factor for the possibility of an accident*

involving an airplane to occur. The area east of Midwest Boulevard was purchased and cleared by Oklahoma County through a bond election in 1973. This area has been fenced and is leased to the Federal government for a nominal fee."

The area near the intersection of Sooner Road and 29th Street is privately owned. The land uses that are allowed in this area, however, are limited to those permitted in the Airport Zoning Ordinance."

According to information obtained from Midwest City staff, the City is currently in the process of preparing a new Comprehensive Plan that will replace the 1985 Plan. Though not completed at the time this JLUS report was prepared, a draft of the new Comprehensive Plan was available for review. Similar to the 1985 Plan, the 2008 Comprehensive Plan contains many references to Tinker Air Force Base. The Land Use Plan map reflects the AICUZ Accident Potential Zones for both runways. Among other recommendations, the draft Plan contains the following narrative:

"Midwest City supports land use planning efforts of the AICUZ Study and recommends that the City:

- *Continue to incorporate AICUZ policies and guidelines into the comprehensive plan;*
- *Modify ordinances to support AICUZ study, as deemed necessary;*
- *Modify building codes to support AICUZ study, as deemed necessary;*
- *Implement height and obstruction ordinances;*
- *Keep the Department of Defense apprised of any development near Tinker AFB that may impact the program for Joint Land Use Studies;*
- *Inform Tinker AFB of planning and zoning decisions that have potential of affecting base operations;*
- *Support the Joint Land Use Study (JLUS) for the Tinker AFB area to protect the area from encroachment."*

It is expected that the 2008 Comprehensive Plan will contain further recommendations stemming from the JLUS report or some form of an addendum to the 2008 Plan will occur after completion of the JLUS effort.

1.7.b Midwest City Zoning

Midwest City first enacted an Airport Zoning Ordinance to protect Tinker Air Force Base in 1960. In 1983, revisions to the ordinance were based in large part on the recommendations contained in the January 1976 AICUZ prepared by Tinker AFB in which CZs and APZs for runways 17/35 and 12/30 were identified. The Airport Environs Zones APZ 1 and the CZs have been adopted. However, the actual airport zoning maps delineate an area somewhat different than the text of the ordinance near the intersection of SE 29th Street and Midwest Boulevard, an area recently acquired by the County. The APZ I for runway 17/35 on the airport zoning map actually stops at SE 15th Street and does not extend north of SE 15th Street as the ordinance describes. One would surmise that SE 15th Street was chosen as the north boundary on the map since it provided a clear and easily definable boundary.

In 1990, the Airport Zoning Ordinance was amended again. Major enhancements to the ordinance provided for density standards, minimum and maximum building sizes, maximum lot sizes, maximum coverage, avigation easement requirements and a new land use compatibility table. The land use compatibility table was revised to incorporate the use of the Standard Industrial Classification Code (SIC) in lieu of the Standard Land Use Coding Manual (SLUCM). This was done because the SIC code provided a more up to date classification of land uses than the SLUCM code. The 1990 Airport Zoning Ordinance was adopted in large part to address development issues in the APZ I for runway 12/30. The revisions to the zoning ordinance were accomplished through consultations with area property owners and the City. (See the January 26, 1990 article in Appendix F of this report.)

As part of the City's effort to prepare the 2008 Comprehensive Plan, Midwest City will also be updating its Zoning Ordinances and Subdivision Regulations. It is expected that changes will be made to the Airport Zoning Ordinance that reflect those JLUS recommendations which the City has determined are in the best interests of the City and Tinker Air Force Base.

1.8 Specific Actions by Oklahoma City

Oklahoma City, over the decades, has worked closely with Tinker AFB to address traffic and infrastructure demands as well as commercial and residential development in the area. Highlights of Oklahoma City's recent efforts to preserve and protect the Tinker AFB APZs through its Zoning Overlay and its Southeast Sector Plan, adopted as an amendment to the OKC Plan, 2000-2020 does the following:

- Prohibits new development which inhibits safe and efficient airport operations within the APZs
- Requires adjacent development to be compatible with the Tinker AFB related activities
- Limits new construction and redevelopment within the flight paths
- Prohibits noise sensitive development such as residences, schools, hospitals, etc. which do not provide the required noise attenuation features
- Ensures all building regulations (floor area ratio and height) are promoted to guarantee the continued efficient airport operation to ensure public safety
- Protects the natural areas around Tinker AFB from encroachment
- Addresses traffic, infrastructure and residential development needs as expansion of Tinker AFB occurs and endorses future recommendations from this Joint Land Use Study
- Ensures that new development will not obstruct military aircraft operations
- Ensures that a Tinker AFB representative will be included in the review of all rezonings and plan amendments within the APZs
- Promotes compatible development within APZs through maintenance of reduced densities
- Ensures that the City will continue to review impacts of development, their visibility characteristics, and penetration of airspace within approach zones
- Prohibits construction of communication towers and antennas in APZs

Zoning Ordinance

- Chapter 59, Article XIII of the existing Zoning Ordinance for Oklahoma City addresses the JLUS study area. The delineation of the APZs on the Future Land Use Plan map and incorporation of policies into the Comprehensive Land Use Plan have been implemented by the existing zoning code.

- The Airport Environs Zone One (AE-1) and the Airport Environs Zone Two (AE-2) regulate development within the APZ I and APZ II respectively. Both zones regulate land use development, noise attenuation and avigation easements.

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SECTION II
Communications Strategies

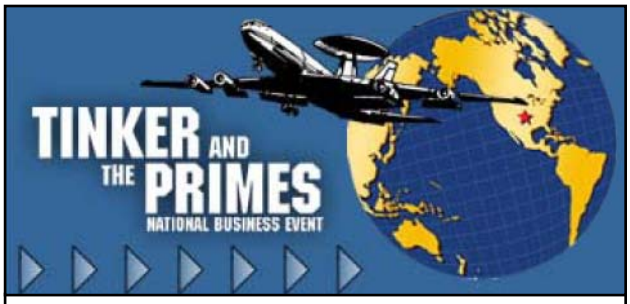
First plane out
An Airman from the 552nd Aircraft Maintenance Squadron marshals one of several aircraft out of its parking spot and on its way to support Operation IRAQI FREEDOM March 28, 2007. (Air Force photo by Staff Sgt. Stacy Fowler)

2.1 Acronyms and Abbreviations

ACOG	Association of Central Oklahoma Governments
AeroEOC	Aerospace Eastern Oklahoma County
AFB	Air Force Base
BRAC	Base Realignment and Closure
CIP	Capital Improvement Program
CRP	Community Relations Plan
EOCTC	Eastern Oklahoma County Tourism Council
FAR	Federal Aviation Regulations
FSC	Family Support Center
HOA	Home Owners Association
JLUS	Joint Land Use Study
MAP	Management Action Plan
MRO	Maintenance, Repair and Overhaul
the Base	Tinker Air Force Base
TLC	Tinker Leadership Council
TMA	Tinker Management Association

2.2 Communications Strategies

The development, implementation and execution of a communications plan is the foundation of a successful partnership. To support the adoption of recommendations of the Joint Land Use Study (JLUS) by multiple jurisdictions, the public involvement plan that was put into place at the beginning of this initiative should continue to provide a template for expanding communications, collaboration and cooperation between Tinker Air Force Base and the greater community around the installation. Historically, the Base has benefited significantly from the support of the State of Oklahoma, local jurisdictions and the private sector. Undeniably, this emphasis on helping Tinker preserve and expand its missions will continue given the pride this region has in hosting the Base. During the adoption and implementation of the JLUS recommendations presented herein, expanded communications among all stakeholders—including the general public—will be well-served.



Tinker and the Primes
Tinker and the Primes is a national business event held annually and is free to all attendees. (Source: www.tinkerandtheprimes.com)

2.3 Public Involvement Plan

Over the course of the JLUS, a comprehensive public involvement plan has been developed and modified frequently as a guide for informing and educating the general public and stakeholders about the study's importance and how its recommendations provide a blueprint for compatible land development around the Base. Given the fact that the Oklahoma City area and the Tinker military installation have enjoyed a synergistic relationship since the 1940s, it would be difficult for the public as a whole to comprehend any changes at the Base. The mere mention of Tinker being down-sized or closed would not be accepted as possible, and a tremendous unified voice would most assuredly speak out vigorously against such changes. However, an on-going public involvement plan should be followed—and enhanced as opportunities present themselves.

Communication tools utilized throughout the Joint Land Use Study (JLUS) included: public meetings of the JLUS Policy and Technical Committees; constantly updated, detailed information on the website at www.acogok.org/jlus; development and application of a graphic presentation for the study including the theme, “Defending Oklahoma’s Future: Tinker AFB”; news release distribution to broadcast and print media in the region; production and distribution of brochures about the JLUS, its recommendations and public meetings; and general information gathering meetings with the Chambers of Commerce for Oklahoma City, Midwest City and Del City.

Pilot in training
Checking out communications aboard an E-3 Sentry here, 9-year-old Erin Trace is assisted by Capt. Jeff Kiger. The aircraft tour was part of deployment activities 150 children had the opportunity to experience during Operation Kids Understanding Deployment Operations. Captain Kiger is assigned to the 960th Airborne Air Control Squadron. (U.S. Air Force photo by Kirk McPheeters)

With the publication of this report, outreach should continue. Stakeholders who are being encouraged to become involved are home builders, commercial developers, realtors, municipal and county planners, independent school districts and other educational institutions, and civic organizations.

The following table summarizes the activities that occurred throughout the study.

Table 2.1 Tinker AFB JLUS Public Involvement Timeline

Tinker AFB JLUS Public Involvement Timeline

	JLUS Activity Time Line		2007								2008						
			May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul
	TASKS	**DATES/NOTES**															
	POLICY MEETINGS																
1	Policy Committee Meeting	2007: 5/4, 6/22, 9/21 2008: 1/4, 2/15, 5/9, 6/3, 6/25, 7/18	x	x			x				x	x			x	x	x
2	ACOG Member Briefing (local, state and federal officials, chambers)	9/27/07					x										
3	Technical Work Group	2007: 5/4, 9/21 2008: 1/4, 2/1, 4/25, 6/25	x				x				x	x		x		x	
	PUBLIC MEETINGS																
4	General Public Meetings	10/18/07, 2/28/08, 6/12/08						x				x				x	
5	Oklahoma County Commissioners public meeting	2/27/08										x					
6	Cleveland County Commissioners public meeting	2/19/08										x					
7	Oklahoma City, City Council public meeting	2/19/08										x					
8	Midwest City, City Council public meeting	2/26/08										x					
9	Del City, City Council public meeting	3/3/08											x				
10	Spencer, City Council public meeting	2/21/08										x					
11	Nicoma Park, City Council public meeting	4/1/08												x			
12	Choctaw, City Council public meeting	2/26/08										x					
	STAKEHOLDERS MEETINGS																
13	Planning and Zoning Commissions	2/18/08-2/29/08										x					
14	Public Independent School Districts, etc.	2/18/08-2/29/08										x					
15	Chambers of Commerce / Economic Development Associations	2/18/08-2/29/08										x					
16	Neighborhood Associations in Affected Areas	2/18/08-2/29/08										x					
17	Area Builders/Developers/Realtors	2/18/08-2/29/08										x					
18	Civic Organizations	2/18/08-2/29/08										x					
	MEDIA/OUTREACH																
19	Daily Oklahoma Editorial Board and other media	9/27/07					x										
20	News Release, 1st public meeting	10/4/07						x									
21	News Release, 2nd public meeting	2/13/08										x					
22	News Release, 3rd public meeting	6/2/08														x	
23	News Release, Draft Recommendations	2/13/08										x	x	x	x	x	
24	Ongoing Media as desired	Ongoing						x	x			x					
25	Chamber Publications	Ongoing						x	x			x					
26	Cable TV local access	Ongoing						x	x			x					
	INFORMATION MATERIALS																
27	Mailers							x	x			x				x	
28	Website (with FAQs)	Ongoing							x			x	x	x	x	x	x

Source: Pavlik and Associates

**Additional media and community meetings to be scheduled as needed*

7/9/2008

2.4 Community Communication and Support

Since the 1940s, business and community leaders have provided the organization, resources and energy to support Tinker AFB and the active and reserve personnel—and families—of the various military services stationed here.

Recycloman
Recycloman and his superheo partner (played by Trudi Logan) are part of Tinker AFB's recycling superduo. They are always ready to pump you up about recycling! (Photo by Brion Ockenfels)

Over the decades, the people of Oklahoma County have proven their support for Tinker by passing two significant capital improvement bond programs (CIP), one in 1973 and one in 2002. The successful elections resulted in the purchase by the county of an aggregate total of 396 acres that were cleared of structures. In 2008, area communities again came together for Base operations and voters approved the purchase of the former General Motors facility by Oklahoma County. The property is being leased to the Base by Oklahoma County for mission expansion.

This region's leadership is intertwined among military and civilian professionals. For example, the economic development director of the Oklahoma City chamber was stationed at Tinker from 1986 until he retired in 1992. The chamber's consultant from the Greentree Group recently retired as the civilian Chief Financial Officer at Tinker. The executive director of the Del City Chamber of Commerce retired from Tinker after 27 years on the Base and 35 years in the Air Force. These relationships are invaluable as the Base seeks to serve and benefit from the surrounding communities, and these communities seek to support and benefit from the Base.

The City of Del City annually sponsors the Armed Forces Day parade which always includes senior command of Tinker Air Force Base and units of Tinker as showcase of community support.

Aerospace Eastern Oklahoma County (AeroEOC) is a regional partnership formed in 2005 by business, military and government leaders to protect and enhance the Maintenance, Repair and Overhaul (MRO) and aerospace activities of the Base and private sector related industries.

AeroEOC is one of the biggest initiatives in which the Midwest City Chamber of Commerce participates. Emphasis is on creating government and contracting opportunities, providing workforce recruitment and training and providing business expansion and relocation services.

AeroEOC
The partnership's mission is to brand, promote, and grow the considerable MRO and Aerospace assets located in Eastern Oklahoma County, especially in and around Tinker Air force Base and its Oklahoma City Air Logistics Center (OC-ALC). (Source: www.aeroeoc.com)

Tinker and the Primes is a national business event held annually and is free to all attendees. Joining the Midwest Chamber in sponsoring this prestigious event are the Oklahoma Small Business Development Center of Rose State College; OG&E Electric Services; Mid America Business Park; North Star Companies LLC and Midwest Regional Medical Center. Also a sponsor is the Chamber's "East Is In," an integrated marketing campaign that promotes housing development and quality of life in Midwest City and Eastern Oklahoma County.

The Greater Oklahoma City Chamber of Commerce is one of the Base's strongest partners. Its focus is on all economic development initiatives around Tinker as well as facilitating federal, state and local support for the various missions of the Base. On a local level, when encroachment issues have threatened base security and given rise to noise concerns, the chamber assumes a role of helping package programs such as CIP bond elections to be held by Oklahoma County.

Currently the Oklahoma City Chamber retains a consultant through the national firm of Greentree to serve as a direct liaison with Tinker's leadership. One role of the liaison is to work on the annual federal insertions with Oklahoma's congressional delegation in order to assure adequate funding for the Base.

The chamber's economic development department not only supports Tinker's military leadership but also supports its contractors and civilian workforce by helping local site managers for aerospace-related manufacturing, supply and repair facilities to bring more operations to the Oklahoma City area.

The Tinker Leadership Council (TLC) exists to facilitate communication and foster an appreciation for the Base and its staff. Growing out of the possible impacts of a Base Realignment and Closure (BRAC), the organization was started by a group of visionaries who understood community consensus building. The council supports economic initiatives and creates opportunities for the area to recognize outstanding work by enlisted personnel. Annual dues are $100 and membership is open to the public.

Tinker Management Association
Petty Officer 3rd Class Kristofer Piros, Strategic Communications Wing ONE, and state Rep. Gary Banz listen during a Tinker Management Association luncheon as USS Oklahoma survivor Paul Goodyear holds a copy of the U.S. Constitution he presented to Petty Officer Piros in a ceremony. (Air Force photo by Dave Faytinger)

The Tinker Management Association (TMA) promotes, organizes, and conducts activities to enhance the professionalism of public administrators assigned to Tinker. Its membership, supported by dues, is open to all civilian and military employees and tenant organizations. TMA helps to build unity in the management team by providing an interchange of information and ideas across organizational lines. Examples of its community projects include: the adoption of the I-40 corridor from Henney Road to Indian Median under the Oklahoma Adopt-a-Highway Program; a bowling tournament, a golf tournament, Christmas in April which is a volunteer home repair program, and Holiday Lights Spectacular in the Joe B. Barnes Regional Park co-sponsored by the Midwest City Chamber of Commerce.

Air Force air shows are valuable community events that inspire patriotism and increase public awareness of the importance of military preparedness. Tinker AFB, in co-sponsorship with the communities surrounding it, has a long history of presenting air shows.

Star-Spangled Salute is an official Air Force event held semiannually. In 2007, the air show became part of a 10-day Star-Spangled Centennial Salute that was sponsored by the Aerospace America and Eastern Oklahoma County Tourism Council (EOCTC). The event commemorated the State of Oklahoma's 100th year of statehood and the 60th anniversary of the U.S. Air Force.

Aerospace America is a 501(c) (3) nonprofit, civilian organization. EOCTC is comprised of nine communities; Choctaw, Del City, Forest Park, Harrah, Jones, Midwest City, Nicoma Park, Spencer and Tinker AFB. Individuals, organizations and companies become partners when they donate money and services to the Star-Spangled Salute.

2.5 Tinker's Communications with Communities

The Tinker AFB General Plan is a comprehensive master planning document which guides on-base development and assesses the military installation's infrastructure and resources as a way to assist in preparing the Base for additional missions.

In 2004, Tinker created a Management Action Plan (MAP) in order to integrate and coordinate environmental and cleanup activities. At the same time, a Community Relations Plan (CRP) was formed to engage interested persons in the restoration process. Both the MAP and the CRP provide significant communication opportunities for the public to learn about the commitment by Tinker and its personnel to improving and protecting the environment. (For additional information about the MAP, CRP, and AeroEOC see Section V.)

The Family Support Center (FSC) on the Base offers a wealth of services to military members and their families, and the surrounding communities rally to help with donations, contributions and volunteer hours. Programs include Loan Locker, which helps families with appliances and such until household goods are shipped to their new "home." Smooth Move is a program that offers a seminar about how to find housing and schools in the local communities. Heartlink welcomes new spouses and helps with their orientation to the area. The Air Force Aid Society provides a "baby bundle" including infant care items when families participate in the Baby Business class offered by Family Advocacy. Family Services also provides a layette to new parents from all branches of the military. The FSC coordinates support groups which help families learn to provide elder care and to cope with the difficult process of grieving. The staff also supports men and women as they prepare for deployment.

The community helps the FSC with providing a well stocked Food Pantry, and a commissary voucher program provides short term relief for military members E-6 and below. The Airman's Attic offers military members E-6 and below and their families a place to "shop" for quality donated items free of charge. Parents often recycle their children's clothing and toys, donating outgrown articles and replacing them for "new" items or clothing in the next larger size.

When the time comes for a military person to separate or retire, the Transition Assistance Program offers an extensive three-day workshop highlighting veteran's benefits, employment and training information and job search skills. The FSC's veterans representative offers local employment assistance to veterans and their families and provides a computer resource room for clients to use.

Other Base noteworthy activities include:

- The DelQuest program and Youth Excel program regularly host gifted students from the Mid-Del School District, offering them the chance to quiz 552nd Air Control Wing members on all aspects of their jobs.
- During the Mid-Del Job Shadow Day, high school students from all school districts shadow Tinker professionals to learn more about various careers that are available at the Base.
- Team Tinker regularly has a booth at the Oklahoma State Fair. Volunteers from the Base tell fair attendees about the Base's unique multi-service mission.

Just the right size
Christie Sanders and 10-year-old Kodie Swaney hunt for a size during the 727th Aircraft Sustainment Group's annual holiday event to provide new clothes for area students. (Air Force photo by Margo Wright)

- Tinker and emergency agencies regularly exercise and plan for unimaginable disasters. For example, Tinker personnel provided significant assistance to nearby communities when 1999's historic tornado flattened neighborhoods west of the Base. When Ice Storm 2007 struck and froze roadways, trees and power lines, many Oklahomans found themselves without heat or power. When the problem hit Tinker, the first sergeants and associate units worked together to keep on-base families warm and in powered environments. More than 130 Base dorm rooms were opened to families without heat.

- Members of the Tinker's Top-3 Organization have volunteered with Central Oklahoma Habitat for Humanity. For example, they helped build three houses dedicated in fall 2007.

- Members of the 552nd Air Control Wing have helped out their local communities in big ways from food to shelter to education, including volunteering with the Citizens Caring for Children program.

- A tour of science and engineering laboratories on the Base allows high school students to get a feel for a science career. Tinker personnel also support the region's annual Sciencefest.

HFH drywall install
Airmen from the 552nd Air Control Wing prepare drywall for the roof of a new garage for a family in need in Oklahoma City. Airmen in the 552nd participate in the Habitat for Humanity program at least twice a year as way to give back to the communities that surround Tinker. (Air Force photo by Senior Airman Lorraine Amaro)

- Clothe the Children and the B-52 Program Office's Clothe-a-Kid Christmas project raises more than $8,000 annually via fundraisers and donations. For example, in December 2007, adult personal shoppers escorted more than 50 elementary and middle school-aged children through Midwest City's JCPenney for new outfits, winter outerwear and backpacks.

- Sailors from the Navy Operational Support Center through the Take Charge and Move Out program volunteer their time at a local elementary school and the Norman Veterans' Center. The sailors participate in "Say No to Drugs" rallies.

- Teen members of the Tinker Youth Center's Patriot Keystone Club support the community in many different ways throughout the year. They have organized and publicized monthly fitness challenges for youth, assisted with National Kid's Day and held the Worldwide Day of Play, an event open to the Tinker community. Tinker AFB is an exemplary model of environmental stewardship. Annually, Tinker Recycle Super Heroes greet nearly 4,000 students from schools around the state.

- Over the past two years, the Tinker P2 Program has helped the installation eliminate pollution by more than 4,000 tons and realize cost savings of over $2 million. The P2 Program is continuing to investigate and coordinate cost saving pollution prevention initiatives to help preserve the environment for future generations while supporting Tinker AFB's military operations at home and abroad.

2.6 Recommendations for the Community in Support of Tinker AFB

To facilitate even greater involvement and support at all levels of the community is the compelling recommendation to: (1) broaden an existing nonprofit organization; or (2) create a new organization that provides for enhanced participation by more persons. An organization such as the Tinker Leadership Council could be considered for this role. As what would be *Friends of the Base,* the organization should solicit membership from young and old, individuals and families, and businesses of all sizes. Emphasis should be on recruiting thousands of members and support from the entities mentioned in this report as well as others. Special membership categories should be considered for families, seniors, students and retired military personnel.

The *Friends of the Base* should enhance existing programs by putting into place activities such as:

- Coordinating an on-going billboard campaign, in which businesses each donate billboard space for a period of one to two months. The message would be "we support our base." As many as 12 businesses could be recruited to participate in order to keep costs relatively low for at least a year-long program.
- Creating the organization's own identity through the development of a logo and marketing slogan for use on all materials. This would brand the organization with the public.
- Designing and producing a coloring book for youngsters through which they are introduced to Tinker AFB in a patriotic way.

Tinker Youth Center
The Missoula Children's Theatre touring production of Snow White and the Seven Dwarfs was held at the Tinker Youth Center. (Air Force photo by Becky Pillifant)

- Developing and maintaining a website for members that gives periodic updates about the Base and activities in which they can become involved.
- Increasing partnerships with retired military and veterans organizations to sponsor public events that celebrate the mission of Tinker AFB.

2.7 Recommendations for Tinker's Involvement in the Community

East is In!
Eastern Oklahoma County is more than just real estate.
(Source: www.eastisin.com)

Tinker Air Force Base enjoys exemplary recognition and respect in the Greater Oklahoma City Metropolitan Area, due to the Base's extraordinary presence here. However, much information about the Base should be targeted to the general public on an on-going basis. The following are low cost recommendations that, if implemented, most assuredly would further educate persons living near the Base about its need to be a part of nearby development decisions as well as to protect itself from any breaches of security.

The Tinker AFB website should be enhanced to make it more user-friendly for area residents who are involved with the Base in any way. It could provide specific information about the Base's environmental initiatives, reasons for unusual noise occurrences, roadway expansion projects especially as they relate to traffic flow, etc.

The public affairs office, while it appears to be fully staffed and functional, should review its protocol for providing information and responding to inquiries in a timely way. Presently, inquiries from the public appear to perhaps be overlooked and/or disregarded.

Tinker's leadership, through the Tinker Management Association, should seek to brief, at least once a year, area City and Town Councils and Oklahoma and Cleveland County Commissioners in what could be described as a "state-of-the-base address"; i.e. what has occurred recently; what can be expected in the short term; and capital improvements on the Base.

A series of community spirit awards should be created by the Base to recognize volunteerism on the part of civilian individuals and groups who go above and beyond in supporting the military.

The public affairs office should provide information to area HOAs for inclusion in their newsletters and on their website. Such material should emphasize land use compatibility with the Base.

2.8 Recommendations for Increased Cooperation

During the implementation of the JLUS, an Oversight Committee should be created to monitor community and economic changes and to work closely with the Base on land use and encroachment concerns. Each city and entity and many of the organizations affiliated with Tinker have a specific relationship with the Base but there is no apparent overall coordination system to make sure all the entities—public and private—are working with the Base so everyone is in sync. ACOG is positioned well to facilitate this action and the JLUS Policy Committee, created for this study, could become the Oversight Committee. It is comprised of elected officials from each of the JLUS partner communities.

In addition, it is recommended that a liaison from Tinker AFB be named to be included in all Zoning Board hearings and land use policy discussions for each of the Study Partners.

Appendix C of this report provides a sample memorandum of understanding that the JLUS partner communities and Tinker AFB could utilize to improve their communications on pending development requests and Base activities.

SECTION III
Components of the Plan

AWACS
An E-3 Airborne Warning and Control System aircraft from Tinker Air Force Base, Okla., flies a mission. The E-3 Sentry is a modified Boeing 707/320 commercial airframe with a rotating radar dome. The dome is 30 feet in diameter, six feet thick and is held 11 feet above the fuselage by two struts. It contains a radar subsystem that permits surveillance from the Earth's surface up into the stratosphere, over land or water. The radar has a range of more than 200 miles for low-flying targets and farther for aerospace vehicles flying at medium to high altitudes. (U.S. Air Force photo by Tech. Sgt. John K. McDowell)

3.1 Acronyms and Abbreviations

AFB	Air Force Base
AFH	Air Force Handbook
AFGP	Air Force General Plan
AICUZ	Air Installation Compatible Use Zone
APA	American Planning Association
APZ	Accident Potential Zone
AT/FP	Anti-Terrorism and Force Protection
CRP	Community Relations Plan
CZ	Clear Zone
DHS	U.S. Department of Homeland Security
DNL	Day-Night Average A-Weighted Sound Level
DoD	U. S. Department of Defense
DOT	U. S. Department of Transportation
EPA	U.S. Environmental Protection Agency
GMP	Growth Management Plan
HUD	U.S. Department of Housing and Urban Development
IRP	Installation Restoration Program
JLUS	Joint Land Use Study
OEA	Office of Economic Adjustment
OSD	Office of the Secretary of Defense
REPI	Readiness and Environmental Protection Initiative
SQSS	Southwest Quadrant Stabilization System
the Base	Tinker Air Force Base

3.2 Basic Conflicts

People

Military installations have historically been located away from urbanized areas. However, employment opportunities draw people and businesses closer to military facilities in order to take advantage of civilian and government business opportunities offered by the installations and their contractors as well as to provide goods and services to support military operations. Additionally, many retired service personnel desire to be in convenient proximity to military facilities in order to utilize their services. It is a natural progression for this population to grow and for development to encroach on facility land, consequently impacting military operations.

Military Operations

Military operations can be loud and present safety concerns for nearby civilian communities. Low flying, high performance military aircraft can create both noise and accident potential during landings, take-offs and training exercises. Conversely, when communities build near active military bases, operational effectiveness, training and readiness missions can be impaired. Civilian encroachment near a military facility, if allowed to go unregulated, can compromise the utility and effectiveness of the installation and its mission. Incompatible land use activities like residences, schools, childcare centers, churches, nursing homes, hospitals, commercial offices and other areas of assembly that are located too close to military base operations must be identified. Appropriate mitigation measures should be implemented to preserve the viability of the military installation's mission, while minimizing the potential adverse effects on the civilian population.

3.3 Air Installation Compatible Use Zone Program

The purpose of the U.S. Department of Defense's (DoD) long-standing Air Installation Compatible Use Zone (AICUZ) program is to promote compatible land development in areas subject to noise exposure and where there is the greatest potential for accidents due to aircraft operations. The AICUZ program's goal is to identify actions designed to protect military airfields and navigable airspace from encroachment by incompatible land uses and structures. Recommendations from the 2006 AICUZ Study for Tinker Air Force Base (AFB) should be included in any planning process undertaken by Del City, Midwest City, Oklahoma City, Spencer, Nicoma Park, Choctaw, and Oklahoma and Cleveland Counties, with the goal of minimizing and reducing incompatibilities that might compromise the Base's ability to fulfill its current and future mission requirements.

Recycling works
Tinker welder Matt Beauford shows Oklahoma City Air Logistics Center Executive Director John Over an area within the F100 turbine frame where a Tinker-developed welding process now saves parts from condemnation, keeping them ready for the warfighter. (Air Force photo by Margo Wright)

The DoD has published a *Practical Guide to Compatible Civilian Development Near Military Installations* to provide local communities with tools, techniques and collaborative efforts that have proven successful for communities to achieve compatible land use near a military installation through judicious administration of local government policies and regulations. This guide contains detailed discussion of planning and zoning practices.

Aircraft accident potential and aircraft noise on and near military airfields should be major considerations in any planning process that local authorities undertake. Land use guidelines for Air Force AICUZ outlined in Air Force Handbook (AFH) 32-7084, *AICUZ Program Manager's Guide*, gives preferred land use recommendations for areas underlying Clear Zones (CZs) and Accident Potential Zones (APZs) I and II. Also included are four noise exposure zones establishing the decibel day-night average, A- weighted sound level (dB DNL). They are:

- 65-69 dB DNL
- 70-74 dB DNL
- 75-79 dB DNL
- 80+ dB DNL

Noise exposure zones are delineated by connecting points of equal noise exposure (contours). Land use recommendations for noise exposure zones have been established on the basis of sociological studies prepared and sponsored by several federal agencies, including the U.S. Department of Housing and Urban Development (HUD), the U.S. Environmental Protection Agency (EPA), the U.S. Department of Transportation (DOT), and the Air Force, as well as state and local agencies. The guidelines recommend land uses that are compatible with airfield operations while allowing maximum beneficial use of adjacent properties. Additionally, guidelines for maximum height of man-made and natural structures are provided to protect the navigable airspace around an airfield, particularly the approach/departure corridors extending along the axis of the runways.

The AICUZ program applies the latest technology to define noise levels in areas around Air Force installations. An analysis of Tinker AFB's flying operations was performed by the Air Force, including types of aircraft, flight patterns, variations in altitude, power settings, number of operations, and hours of operations. This information was used to develop the noise contours contained within the 2006 AICUZ Study. The same noise contours will be used for this Joint Land Use Study (JLUS) analysis. However, the 1983 AICUZ noise contours have been utilized by some of the jurisdictions surrounding Tinker AFB and some comparisons related to noise affected areas will also be referenced in Section VI.

3.4 Joint Land Use Study

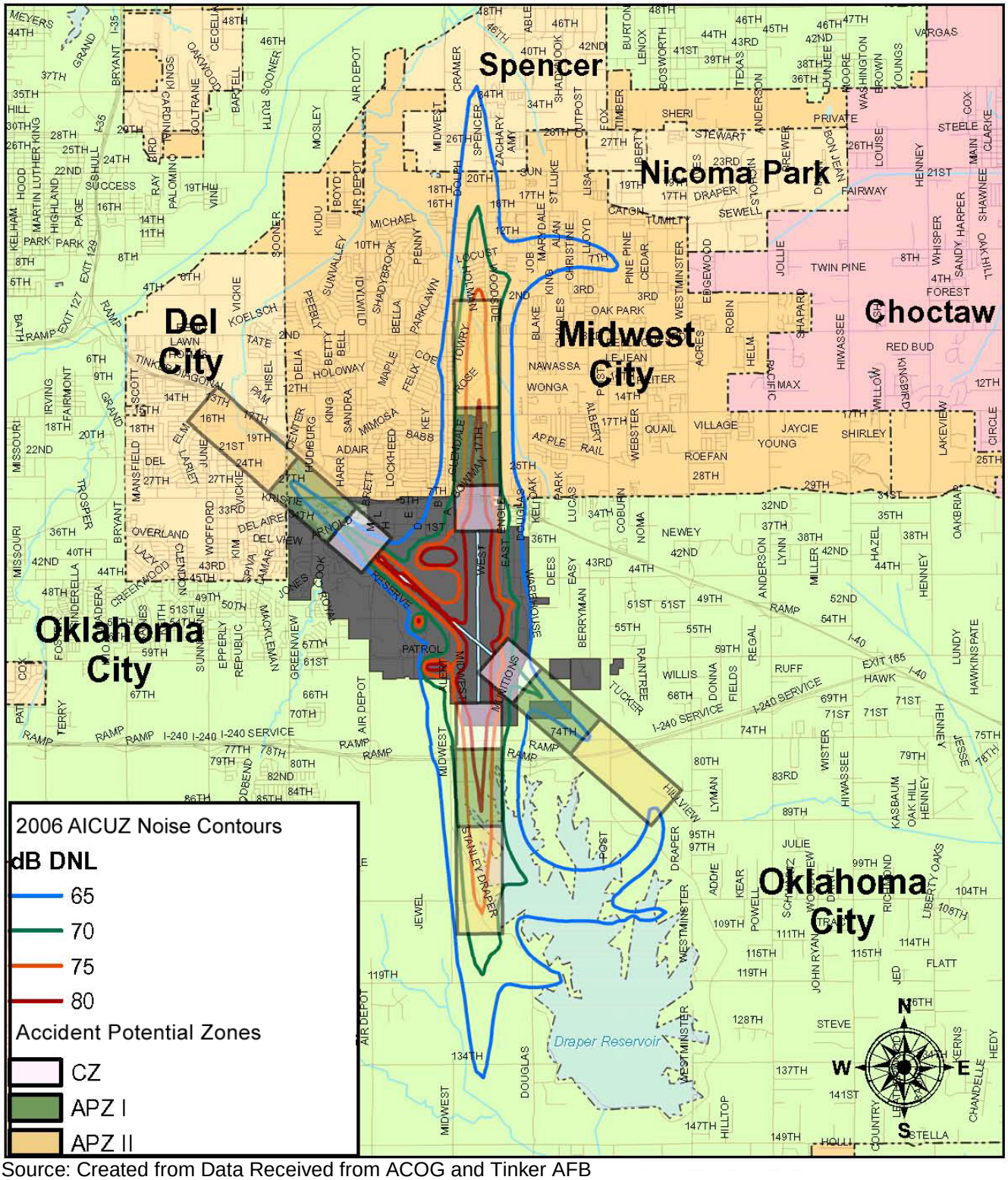
A Joint Land Use Study (JLUS) is a cooperative land use planning effort between an affected local government or governments and a military installation. The recommendations from a JLUS provide a policy framework for local jurisdictions to support adoption and implementation of compatible development measures designed to: (1) prevent inappropriate land use encroachment; (2) safeguard the military mission, and (3) protect the public health, safety and welfare of the entire community. Figure 3.1 provides the study area for the Tinker AFB JLUS and the communities surrounding the Base that were partners in this study.

3.4.1 Goals of the JLUS

Among the primary goals of the JLUS are the protection and support of current operations and for the potential expansion of the missions of Tinker AFB, the largest single-site employer in the State of Oklahoma. Other study goals include:

- Protection of the long term health and safety of the civilian and military populations that live and work near the Base
- Increased public awareness of the importance of minimizing and reducing inappropriate land use encroachments that could adversely impact Tinker's missions
- Improved communication and formal coordination between Tinker AFB officials and surrounding community leaders and planners on land development decisions
- Comprehensive evaluation and comparison of existing regulatory measures and land use plans adopted by surrounding local governments
- Identification of conflicts between the AICUZ Study recommendations and the surrounding local governments' existing development, land use regulations and long range plans
- Recommendations for reducing potential conflicts, including potential changes to building codes, zoning ordinances, subdivision and site plan regulations and long-range community plans

Figure 3.1 Joint Land Use Study Area



Source: Created from Data Received from ACOG and Tinker AFB

Measures necessary to implement JLUS recommendations may involve revisions to the communities comprehensive plans and land development regulations, consideration of factors such as zoning, subdivision regulations, building codes, height restrictions, increased sound attenuation in existing and new buildings, land exchanges, transfer of development rights and real estate disclosure.

The Air Force has historically relied on the AICUZ program to address encroachment concerns. Major commands and installation civil engineers and planners are required to prepare, release, and maintain AICUZ studies for every installation and auxiliary airfield with active runways. Analyses and recommendations from AICUZ studies support the Air Force JLUS processes with local communities and other stakeholders. JLUS recommendations are designed to promote compatible development through comprehensive land use planning and appropriate development regulations in the surrounding communities. Among recommendations generally included in JLUS studies are the proposed purchase of real property interest in fee and appropriate restrictive easements acquired by the Air Force to help minimize inappropriate land uses. AICUZ policy requires installations to acquire, through fee or an appropriate restrictive easement, all real property interests within the designated CZs when the land use is incompatible.

3.5 Military Readiness and Encroachment

“Encroachment” is the cumulative impact of land development pressures affecting military installations and their ranges by the surrounding communities. Encroachment affects the military as well as the surrounding non-military communities. The DoD requires access to the lands it occupies to train its soldiers, sailors, and airmen; to test its weapons systems and equipment; and to maintain mission readiness. Encroachment limits the military’s ability to fully utilize its training and testing facilities for their intended purposes and increases the potential for adverse effects on property in surrounding local jurisdictions. Environmental impacts can also be a factor of encroachment.

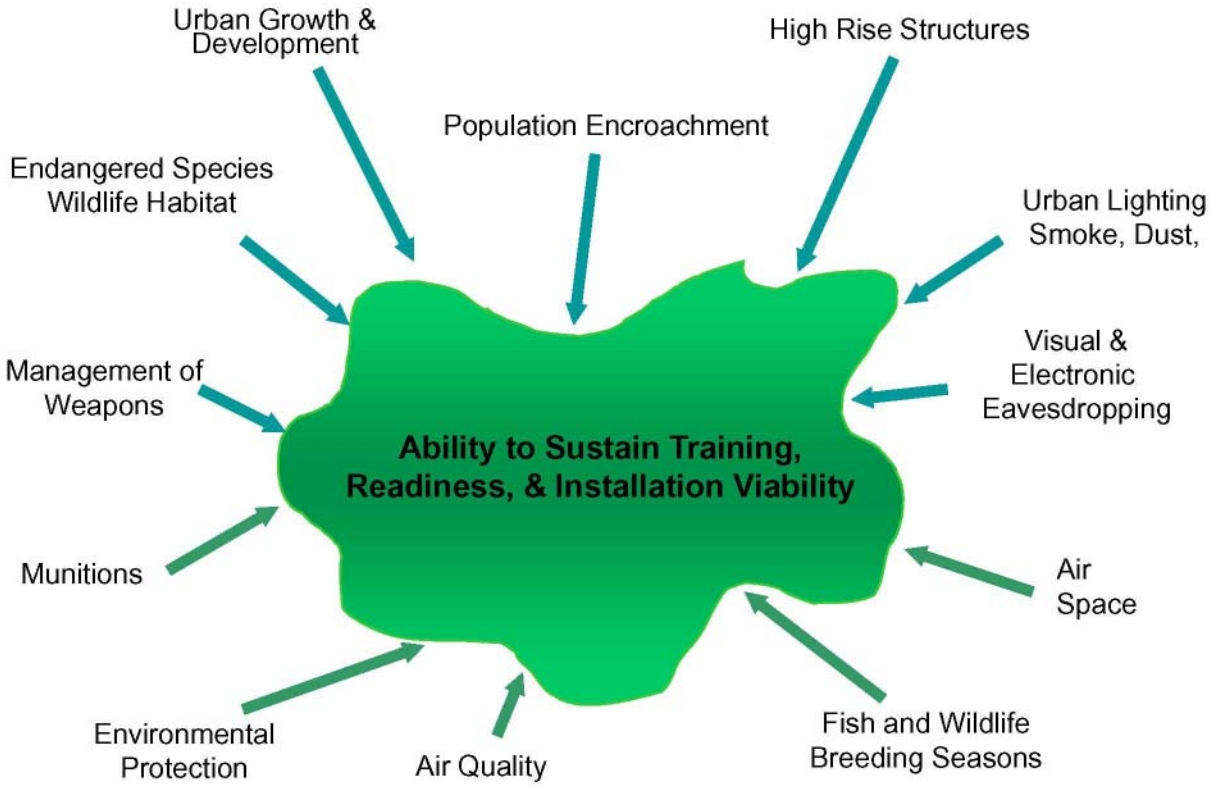
DoD operational training and test ranges are increasingly being hemmed in by adjacent civilian development. This development results in increased limitations and restrictions on military operations and training. The growth of civilian communities around military installations forces the military services to shift training and testing procedures and adjust their readiness protocols. The military's civilian neighbors place unforeseen restrictions on the use of natural and physical resources currently set aside for military training, in addition to restricting the times and conditions under which these operations can be conducted.

At the same time, military training and testing activities often encroach on the local communities. DoD operations and their environmental footprint often extend to lands which DoD does not own or control. State and local governments maintain responsibility for land use planning (local), environmental regulation (state) and enforcement (both). The sharing of air, land, and water resources dictates the need for partnerships between the three primary stakeholders; the military, regional/state/local regulatory agencies, and local populations.

Encroachment pressures boil down to a continuing competition for resources growing ever more scarce. Resources such as land continue to diminish in availability. History indicates that the financial resources of state and local governments will continue to be in short supply due to the increasing demands of their constituencies. Regulatory environments by nature continue to become more stringent over time. Some regulatory factors include wilderness designations, cultural sites, unexploded ordnance, commercial development, population increases, maritime issues, air quality, water quantity and quality, noise abatement, air space congestion and competition, and endangered species and wildlife habitat. Work needs to be done to identify and define these resources in order to clearly specify how to preserve those resources for "compatible uses."

Understanding state and local regulations and improving coordination across the broad spectrum of state and local agencies are critical to finding and enacting solutions to the problems of encroachment. Solutions need not entirely restrict the use of land resources; rather they must ensure the compatibility of uses. Most importantly, solutions must be proactive in order to prevent encroachment and, if necessary, to take remedial action to minimize or eliminate inappropriate land uses.

Figure 3.2 Environmental Factors



Source: www.oea.gov

3.5.1 Impact of Urbanization

While the effect varies by military service branch and the installation on which operations are being conducted, in general, encroachment has had a limiting effect on the extent to which training ranges and facilities are available or on the types of training that can be conducted. This encroachment may limit the ability of units to train in a simulated environment and/or requires work around the constraints. DoD and military officials report that many encroachment issues are related to urbanization around military installations. They note that most, if not all, encroachment concerns—such as noise, airspace, endangered species habitat, and air quality—result from population growth and urbanization. Furthermore, growth around DoD installations is increasing at a rate greater than the national average for areas without military bases. At the same time, the increased speed and range of weapon systems are expected to increase the range requirements for training.

The Air Force is experiencing encroachment pressures that potentially limit training and testing capacity and capabilities at operational ranges that ultimately may impact their efficiency in maintaining appropriate training and readiness. Encroachment pressures generally fall within three broad categories: (1) competition for resources (e.g., access to land, water, air, and key frequencies in the communications spectrum); (2) civilian community concerns regarding military operations (e.g., complaints about noise); and (3) environmental enforcement and compliance issues. The Air Force has tried many strategies to limit incompatible land development around once isolated facilities, although they have not been as effective as needed. Land developers and home builders often ignore "advisories", and specific zoning restrictions have not been used by local governments to effect the desired restrictions. Oftentimes, there is no specific requirement to disclose to home buyers and renters that an active military facility is nearby and that it may be close enough to impact their residences.

3.5.2 Development Regulations and Encroachment

Inappropriate private sector land use encroachment continues to be a significant issue for many military installations. The communities surrounding the Base have made many modifications to their current and long range land use regulations and policies in order to help minimize inappropriate land uses that may otherwise encroach upon the installation. Long range planning efforts tend to be implemented through tools like zoning and subdivision regulations. These implementation tools tend to be more affected by local legislative activities. Local jurisdictions should be cognizant of actions that may have an adverse effect on the base and its operations.

Oklahoma statute 11-43-101.1 states that cities with an active-duty United States Air Force Base are permitted to enact an ordinance restricting or prohibiting uses within five miles of a military installation that are considered to be hazardous to aircraft operations.

> *"The city ordinance shall:*
>
> *Be consistent with the most current recommendations and studies titled "Air Installation Compatible Use Zone Study" made by the United States Air Force installations at Altus AFB, Tinker AFB, and Vance AFB or studies made by United States Department of the Army installation at Fort Sill titled "Army Compatible Use Buffers" or "similar zoning relating to or surrounding a military installation as adopted by a county, city, or town or a combination of those governmental entities."*

This statute appears to grant local governments the right to create long term or permanent strategies, i.e. creation of conservation easements and buffering activities, to ensure that areas near Tinker AFB are permanent buffers against encroachment. This is, of course, in addition to relying on zoning or other potentially non-permanent land-use control policies and regulations.

3.6 Anti-Terrorism and Force Protection

Combat Readiness School
Master Sgt. Larry Shenold, chief of academics, teaches how to handle prisoners, focusing students on what to expect in areas like Iraq and Afghanistan. Training in land navigation, self-aid/buddy care and field fortifications are part of the first week. By week three, Airmen are living and defending positions, learning to survive under sleep-deprived, harsh conditions. (Air Force photo by Margo Wright)

The September 11, 2001, attacks on the World Trade Center—and other acts of global terrorism since—have highlighted the ever-increasing importance for the development and implementation of effective anti-terrorism policies and procedures. While Anti-Terrorism and Force Protection (AT/FP) issues are not of pivotal concern to the JLUS process, they are relevant topics when examining land use activities in close proximity to military installations. It was primarily at the federal level (via the U.S. Department of Homeland Security (DHS) and agencies cooperating with or reporting to the DHS) that a set of targets and criteria focused on anti-terrorist activities has been established. In 2003, the Federal Emergency Management Agency (FEMA) created, in cooperation with branches of the Armed Forces and other federal agencies, a Risk Management Series of manuals, each offering guidance and outlining explicit criteria for designing buildings and sites to reduce or minimize the impacts of terroristic activities. Although the bulk of the information that has been developed focuses on increasing the structural integrity of buildings and nearby areas, the manuals also indicate that smart site planning on surrounding properties can help lessen the impact of potential terroristic acts.

3.7 DoD: Conservation Partnering Authority

The FY-03 Defense Authorization Act (Title 10 U.S. Code § 2684a) includes a provision that authorizes the military departments to enter into agreements with eligible entities to acquire real estate interests in the vicinity of military installations. The Office of the Secretary of Defense (OSD) created the Conservation Partnering Program [now known as the Readiness and Environmental Protection Initiative (REPI)] to implement this authority. Under this program, OSD funds the services to implement compatible land use partnering projects that aim to relieve encroachment pressures on training, testing, and support operations at U.S. military bases.

DoD is authorized to enter into service partnership agreements with eligible non-federal entities that share an interest in preserving and protecting land not under military control, particularly where incompatible development and/or loss of natural habitat does or would impact military base operations and readiness. Under such an agreement, DoD funds can be used to acquire real property in the vicinity of military installations to protect military training, testing operations, and readiness. Eligible entities include state and local governmental agencies and private conservation organizations, including local land trusts. The partnership agreement must provide for the acquisition of all rights, title, and interest, or any lesser interest, in real property by the eligible entity. The agreement must also provide for the sharing of acquisition costs.

The President's FY-09 national defense budget continues to provide funding in support of readiness and environmental protection. Approximately $40 million has been allocated for REPI, which has protected over 48,000 acres around military bases to date.

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SECTION IV
Technical Information and Analyses

Midwest City
Recent development serves the area's growing population.
Source: City of Midwest City.

4.1 Acronyms and Abbreviations

ACOG	Association of Central Oklahoma Governments
AFB	Air Force Base
AICUZ	Air Installation Compatible Use Zone
APZ	Accident Potential Zone
BRAC	Base Realignment and Closure
CZ	Clear Zone
dB	decibel
dBA	A-weighted sound level measured in decibels
DNL	Day-Night Average Sound Level
DoD	U.S. Department of Defense
FAA	U.S. Federal Aviation Administration
FAR	Federal Aviation Regulations
JLUS	Joint Land Use Study
UFC	Unified Facility Criteria
USAF	United States Air Force
USN	United States Navy

4.2 Technical Information

The purpose of the U.S. Department of Defense's (DoD) long-standing Air Installation Compatible Use Zone (AICUZ) program is to promote compatible land development in areas subject to increased noise exposure and accident potential due to aircraft operations. The AICUZ program has as the additional goal of protecting military airfields and navigable airspace around them from encroachment by incompatible land uses and structures.

A grand affair
The Team Tinker booth at the Oklahoma State Fair and Centennial Expo allows volunteers like Petty Officer 2nd Class Todd Bigart to tell fairgoers about the mission of the Base. Civilian, Air Force and Navy personnel. (Air Force photo by Amy Schiess)

Tinker AFB is one of the DoD's premier joint service facilities. The Air Logistics Center's mission is dedicated to providing worldwide technical logistic support to Air Force and Navy weapon systems. The center's personnel manages over 2,000 aircraft, including the B-1, B-2, B-52, C/KC-135, E-6 and E-3 as well as an inventory of approximately 23,000 jet engines. Its major product line of aircraft, propulsion and commodities manages, maintains and procures resources to support first-line overhaul and maintenance of B-1, B-2 and B-52 bombers, the multipurpose C/KC-135 aircraft, and several missile systems. The center's facilities house some of the most sophisticated technical repair and manufacturing processes in the world, acquiring and maintaining superior aviation systems.

4.2.1 Runway Airspace "Imaginary" Surfaces

The safety zones around a runway are dictated by the agency or department that owns and manages the runway. The shape and size of the runway safety zones can vary based on different aircraft types, runway lengths, and runway designations. In the case of DoD ownership, the U.S. Air Force, Navy, and Army have established slightly different systems of zones and imaginary surfaces. Because of the current Air Force ownership of the runway and the likely missions, this study limits its analysis to the Air Force criteria, and does not address the Navy and Army criteria.

In the Air Force, the criteria are determined by the classification of the runway, which depends on the type of mission being supported. In general, there are two runway types, Class A and Class B. The regulations also define another type of runway, called a Contingency Landing Zone, which is limited to short dirt or paved runways used in-theatre or for training purposes. Because of the relative rareness of Contingency Landing Zones in the Air Force, this study does not address these criteria; it outlines the Class A and Class B options to represent the minimum and maximum runway footprints.

4.2.1.a Class A Runway (NOT at Tinker AFB)

Class A runways are primarily intended for small light aircraft. Ordinarily, these runways are less than 8,000 feet long, and have less than ten percent of their operations involving aircraft in the Class B category. This type of runway is not intended to support high performance and large heavy aircraft. In general, Class A runways are limited to auxiliary fields or secondary runways at larger Air Force bases. There are few, if any, Air Force flying missions that are based on Class A runways.

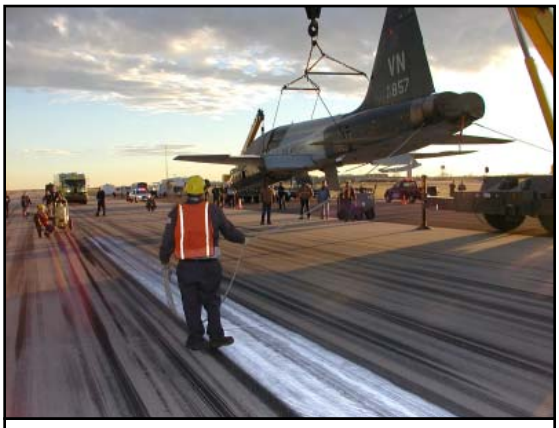
4.2.1.b Class B Runway

Class B runways are designed to support high-performance and heavy aircraft. This includes all fighter, bomber, and heavy lift missions. Most Air Force bases have at least one Class B runway to support their primary mission. The DoD safety zones that are relevant to this study are the Clear Zone (CZ) including the graded portion of the CZ, Accident Potential Zone (APZ) I and APZ II. These zones are located at both ends of each runway.

Tinker AFB has two major or Class B runways. Runway 17/35 is 11,100 feet long and Runway 12/30 is 10,000 feet long. Runway 17/35 is the primary runway and accommodates the majority of air traffic at the Base. Air Force obstruction criteria are based on Unified Facility Criteria (UFC) 3-260-01. Definitions of the runway airspace "imaginary" surfaces are as follows.

4.2.1.c Primary Surface

The primary surface is an imaginary surface symmetrically centered on the runway, extending 200 feet beyond each runway end that defines the limits of the obstruction clearance requirements in the vicinity of the landing area. The width of the primary surface is 2,000 feet, or 1,000 feet on each side of the runway centerline.



Steady hand
John Trip, Computer Sciences Corporation T-38 mechanic and crash recovery team member, helps steady a T-38 being removed from the runway at Tinker Air Force Base, Okla. (Photo by Brian Rochester)

4.2.1.d Clear Zone Surface

The CZ surface is an obstruction-free surface (except for features essential for aircraft operations) on the ground symmetrically centered on the extended runway centerline beginning at the end of the runway and extending outward 3,000 feet. The CZ width is 3,000 feet or 1,500 feet on each side of the runway centerline.

4.2.1.e Accident Potential Zone Surfaces

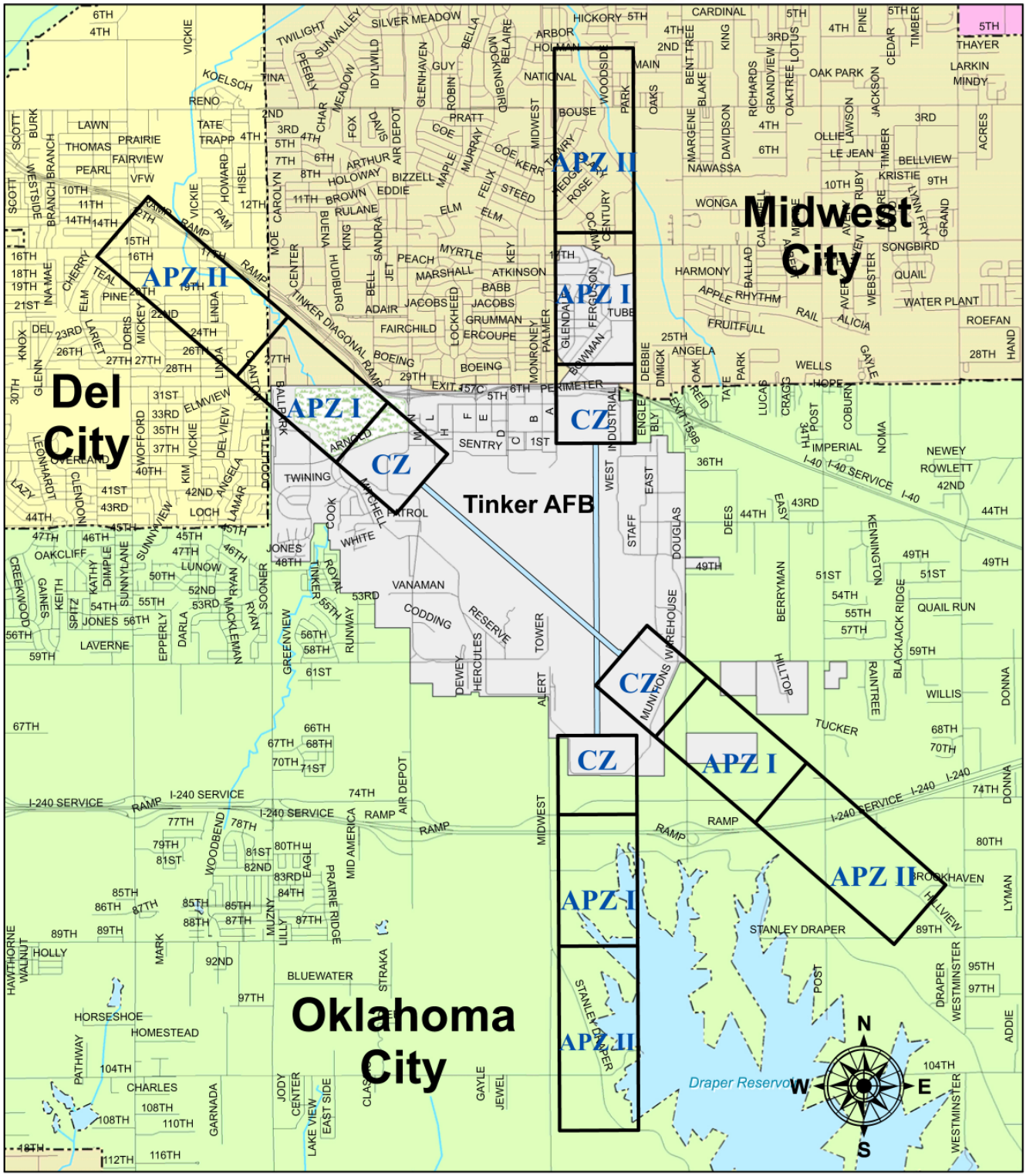
The APZ I surface begins at the outer end of the CZ and is 5,000 feet long and 3,000 feet wide. APZ II begins at the outer end of APZ I and is 7,000 feet long and 3,000 feet wide. Figure 4.1 illustrates the APZ and CZ zones surrounding Tinker AFB. The APZ II zones on the Crosswind runway were added under the 2006 AICUZ Study for Tinker AFB.

4.2.1.f Approach-Departure Clearance Surface

The approach-departure clearance imaginary surface is symmetrically centered on the extended runway centerline, beginning as an inclined plane (glide angle) 200 feet beyond each end of the primary surface, and extending for 50,000 feet. The slope of the approach-departure clearance surface is 50:1 until it reaches an elevation of 500 feet above 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 2,000 feet, flaring uniformly to a width of 16,000 feet at the end point.

Runway orientation is key to a safe, efficient, and usable aviation facility. Orientation is based on an analysis of wind data, terrain, local development, operational procedures, and other pertinent data. Where wind coverage of the primary runway is less than 95% or where the wind is from a direction other than the direction of primary runways, crosswind runways are required.

Figure 4.1 Accident Potential Zones I and II and Clear Zones Surrounding Tinker AFB



Source: Created from Data Received from ACOG and Tinker AFB

4.3 Air Installation Compatible Use Zone Studies

The Air Installation Compatible Use Zone (AICUZ) program was established by the DoD to promote compatible land use around military airfields. The military services maintain an AICUZ program in an effort to protect the operational integrity of their flying mission. DoD Instruction 4165.57 establishes the AICUZ program which is similar to the Federal Aviation Administration's Federal Aviation Regulation Part 150 program for civil airports. The AICUZ program is a land use planning program, not a land acquisition or land management program, and usually precedes the Joint Land Use Study.

Joint Land Use Study
Tinker environmental spokesman Brion Ockenfels discusses an Air Installation Compatible Use Zone map with area residents attending the Joint Land Use Study town meeting Oct. 18, 2007 in Midwest City. (Air Force photo by Ralph Monson)

The purpose of an AICUZ is twofold: 1) to promote public health and safety through the local adoption of compatible land use controls and 2) to protect the operational capability of the air installation. It was created in response to increased urban development around military airfields. Many Air Force installations were built in the late 1940s and early 1950s in locations 10 to 15 miles away from urban population centers. Since then, urban growth has gradually moved closer towards the boundaries of many installations. Incompatible land usage often results in complaints over the effects of aircraft operations (e.g. noise, low over-flights, etc). Frequent complaints can cause operational changes, which in many cases, adversely affect the flying mission. Conversely, land uses including those that attract birds, produce electrical, light or smoke/dust emissions that could obscure the pilots' vision, or interfere with the operation of electronic equipment on board the aircraft are problematic.

An AICUZ Study is written from the military perspective and contains land use compatibility guidelines based on noise exposure zones, APZs, and obstructions to air navigation. The JLUS report that normally follows is written for the communities, reiterating the AICUZ's compatibility guidelines, and expanding land use policy and regulatory recommendations for the adjacent communities. The primary difference between the two is the JLUS focuses on the framework to support **adoption and implementation** of compatible development standards designed to prevent urban encroachment; safeguard the military mission; and protect the public health, safety, and welfare.

In order to provide land use compatibility guidelines, the 2006 AICUZ Study identifies three basic constraints that affect flight operations: height limitations, noise levels generated by aircraft operations and statistical analysis of past aircraft accidents.

4.4 2006 AICUZ Study for Tinker AFB

The 2006 Tinker AFB AICUZ Study updated the 1998 AICUZ Study. The update documents changes for the period of 1998 to 2006, including actions taken as a result of the recommendations of the Base Realignment and Closure Commission (BRAC) in 2005.

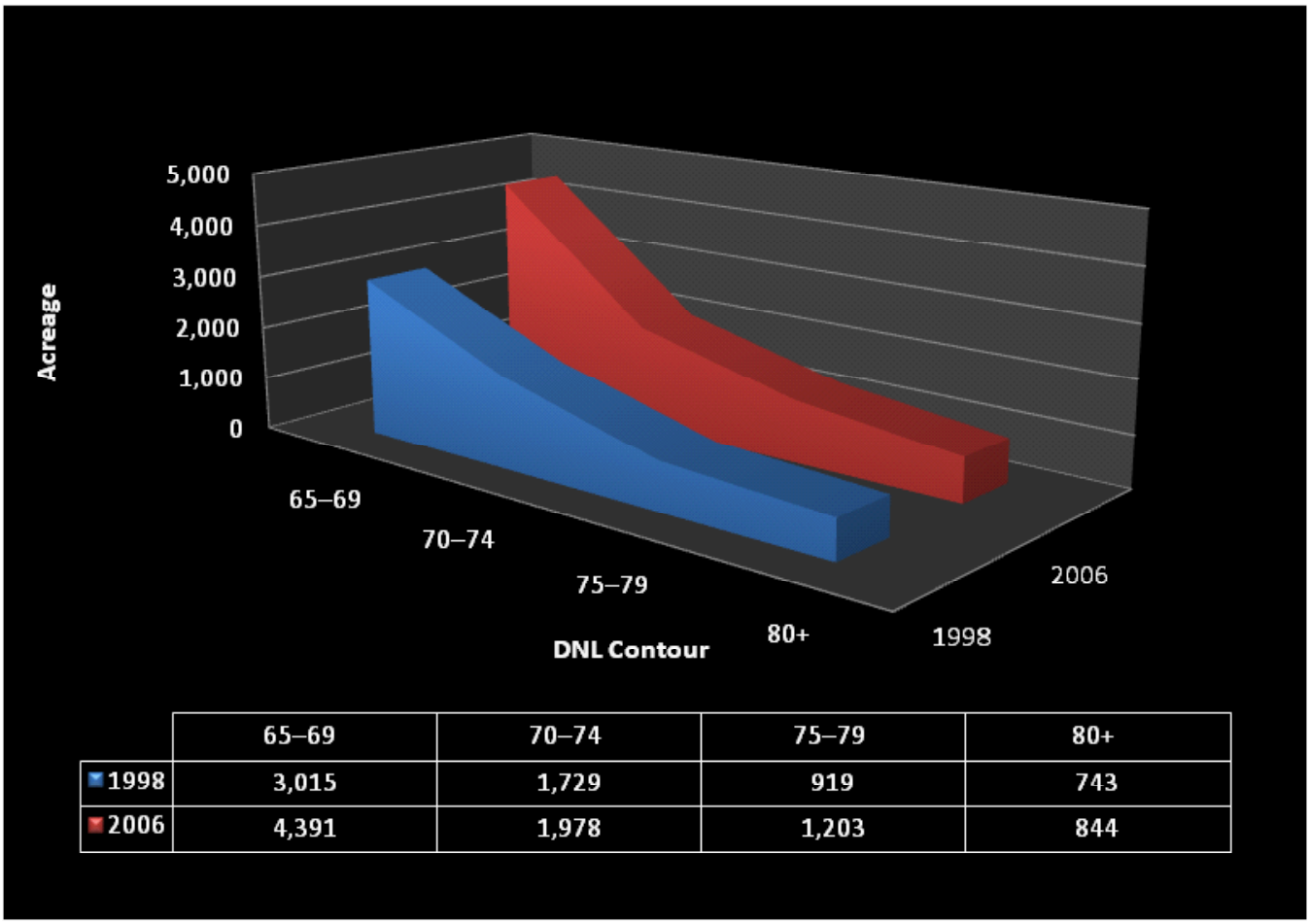
The AICUZ Study, prepared in 2006, documented current flight operations and revised noise contours. Changes that occurred since the 1998 Tinker AFB AICUZ Study include:

- An increase in the number of operations by based aircraft
- The addition of four based KC-135 aircraft
- An increase in the number of transient aircraft operations
- Addition, elimination, and modification of aircraft flight tracks to correspond to flying operations changes
- Technical improvements to the NOISEMAP computer modeling program
- Addition of APZ II for the crosswind runway

Due to the alteration of flight tracts for new mission purposes, the 2006 Study analyzed aircraft noise and accident potential to determine land use compatibility and provided compatible land use guidelines for the area surrounding the Base to assist local communities in future planning and zoning activities.

As illustrated in Figure 4.2, the increase in flight activity at the Base resulted in the predictable increase in affected acreage contained within each of the established noise zones. The AICUZ Study also provided an analysis of various land uses surrounding the Base including the acreages of land use categories and zoning districts within specific AICUZ accident and noise zones.

Figure 4.2 Comparison of Total Acreage in AICUZ Noise Contours



	65–69	70–74	75–79	80+
1998	3,015	1,729	919	743
2006	4,391	1,978	1,203	844

Source: 2006 AICUZ Study for Tinker AFB

4.4.1 Air Installation Compatible Use Zones

Communities around Tinker AFB are exposed to the possibility of aircraft accidents even with well maintained aircraft and highly trained aircrews. This fact is confirmed by USAF analysis of over 800 major accidents at many bases from 1968 through 1995 which occurred within 10 miles of a military installation. As a result, critical planning zones have been established.

While the possibilities of an aircraft mishap are remote, the Military recommends that land uses within these Accident Potential Zones be minimal or low density to ensure maximum protection of public health and property. This gives local planners a tool to promote development compatible with airfield operations.

Table 4.1 shows the cumulative percentage of accidents from data collected by the Air Force between 1950 and 1996 in the United States. According to the table, accident potential appears to increase proportionally with the aircraft's distance from the runway centerline.

Table 4.1 Accident Potential Location Analysis

Table 2.1: Accident Potential Location Analysis			
Length from Both Ends of Runway	***Width of Runway Extension***		
	2,000 feet	***3,000 feet***	***4,000 feet***
	Percent of Accidents		
On or adjacent to runway (1,000 feet to each side of runway centerline)	23	23	23
0 to 3,000 feet	35	39	39
3,000 to 8,000 feet	8	8	8
8,000 to 15,000 feet	5	5	7
	Cumulative Percent of Accidents		
On or adjacent to runway (1,000 feet to each side of runway centerline)	23	23	23
0 to 3,000 feet	58	62	62
3,000 to 8,000 feet	66	70	70
8,000 to 15,000 feet	71	75	77

Source: 32 CFR PART 256—AIR INSTALLATIONS COMPATIBLE USE ZONES

4.4.1.a Clear Zones

The Clear Zone (CZ) has the highest potential for accidents to occur. Twenty-seven percent of the accidents studied occur in the CZ. Land acquisition through purchase or easements can be utilized to eliminate any development activity, and thus decrease exposure to damages resulting from accidents that might occur.

4.4.1.b Accident Potential Zone I

The APZ I is 3,000 feet wide and extends from the CZ 5,000 feet and includes an area of reduced accident potential. Ten percent of the accidents studied occurred in this area.

Controlling land use near military airfields is important to minimize the damage from potential aircraft accidents and to reduce hazards to air navigation. Thus, the DoD has delineated APZs in the vicinity of airfield runways where, if a problem develops, an aircraft mishap would likely occur. Studies show that most mishaps occur on or near the runway or along the extended centerline of the runway.

Various industrial, manufacturing, and agricultural land uses are acceptable within APZ I. However, uses that concentrate people in small areas, such as higher density housing, pose a conflict with the safety risks of this zone.

4.4.1.c Accident Potential Zone II

The APZ II is 3,000 feet wide and extends from the outer end of the APZ I an additional 7,000 feet. This is an area of further reduced accident potential. Five percent of the accidents studied occurred in this area. The accident potential in APZ II is low enough that low-density housing and commercial uses are considered to be compatible with flight operations. Military guidance suggests low density residential uses of one to two dwelling units per acre in APZ II. High density functions such as multi-story buildings and places of assembly (e.g., theaters, schools, churches and hospitals), however, raise compatibility issues.

Designation of safety zones around the airfield and restriction of incompatible land uses can reduce the public's exposure to safety hazards. Air Force accident studies have found that aircraft accidents near Air Force installations occurred in the following patterns:

- 61% were related to landing operations
- 39% were related to takeoff operations
- 70% occurred in daylight
- 80% were related to fighter and training aircraft operations
- 25% occurred on the runway or within an area extending 1,000 feet out from each side of the runway
- 27% occurred in an area extending from the end of the runway to 3,000 feet long the extended centerline and 3,000 feet wide, centered on the extended centerline
- 15% occurred in an area between 3,000 and 15,000 feet along the extended runway centerline and 3,000 feet wide, centered on the extended centerline

Air Force statistics reveal that 75% of aircraft accidents resulted in definable impact areas. The size of the impact areas were:

- 5.1 acres overall average
- 2.7 acres for fighters and trainers
- 8.7 acres for heavy bombers and tankers

4.5 2006 AICUZ Land Use Analyses

The noise contours and APZs presented in the 2006 AICUZ Study were based on data collected at Tinker AFB in April 2005. The Air Force reviewed and validated the data through a communicative process that was finalized in January 2007.

4.5.1 Objectives for an AICUZ Study

The Tinker AFB AICUZ Study fulfilled two key functions. By assessing current operations, it delineated noise contours and accident potential zones to provide a geographic basis for the JLUS. At the same time, based on research done by military and civilian organizations, it recommended a strategy for community land uses that would be compatible with:

- Airfield operations
- Noise levels
- APZs
- Flight clearance requirements

Land within the Base environs predominantly falls within the cities of Midwest City, Del City and Oklahoma City. The majority of the developed land surrounding the Base can be characterized as moderate density (four to seven units per acre) urban development, with areas of undeveloped land south of the installation.

4.5.2 Land Use and AICUZ

Based on the noise and safety considerations discussed in this document, the 2006 AICUZ Study contains land use recommendations that are divided into those related to noise contours and those related to APZs. They apply to the entire area contained within defined boundaries. The land uses are categorized as follows:

- **Compatible Development:** These areas represent developed or protected parcels that are compatible with applicable land use recommendations in their current state.
- **Incompatible Development:** These areas represent developed parcels that are incompatible in their current state.
- **Potentially Incompatible Development:** These undeveloped areas may be susceptible to incompatible development in the future because of their current zoning status.

The goal is to encourage land uses that are compatible with the operations of Tinker AFB. In relation to the Base, incompatible uses are those which: (1) are noise sensitive; (2) involve a high concentration of people (if they are in any of the APZs); and (3) interfere with safe air operations.

The DoD has prepared a detailed and comprehensive list of suggested compatible land uses for both noise zones and APZs, by classification, as shown in Table 4.3 beginning on page IV-21.

4.5.2.a Existing Land Uses within the AICUZ Planning Zones

Tinker AFB has four 3,000 foot by 3,000 foot Clear Zones, four 3,000 foot by 5,000 foot APZ I zones, and four 3,000 foot by 7,000 foot APZ II zones. In order to provide land use compatibility guidelines, the AICUZ Study describes three basic constraints that affect flight operations: height limitations, noise levels generated by aircraft operations and statistical analysis of past aircraft accidents.

Using the above information, as well as Land Use Compatibility guidelines, an “Incompatibility Land Use Table” was included in the AICUZ Study. Each land use met compatibility criteria for its category for both noise and accident potential in order to be considered compatible. The study determined that certain uses are incompatible in the APZs and CZs. Details of these incompatible uses are summarized as follows and in Table 4.2:

- **Clear Zone:** No incompatible land uses were identified within the four defined clear zones, due to the majority of property located within the CZs being located on Tinker AFB property.
- **APZ I:** Within the four APZ I zones, four acres contained residential uses, four acres contained public/quasi public uses, and 41 acres contained commercial uses.
- **APZ II:** Within the four APZ II zones, 409 acres contained residential uses, and 121 acres contained public/quasi public uses.

Table 4.2 and Figure 4.3 reflect the incompatible land uses within both the APZs and noise contours that were identified in the 2006 AICUZ Study for Tinker AFB.

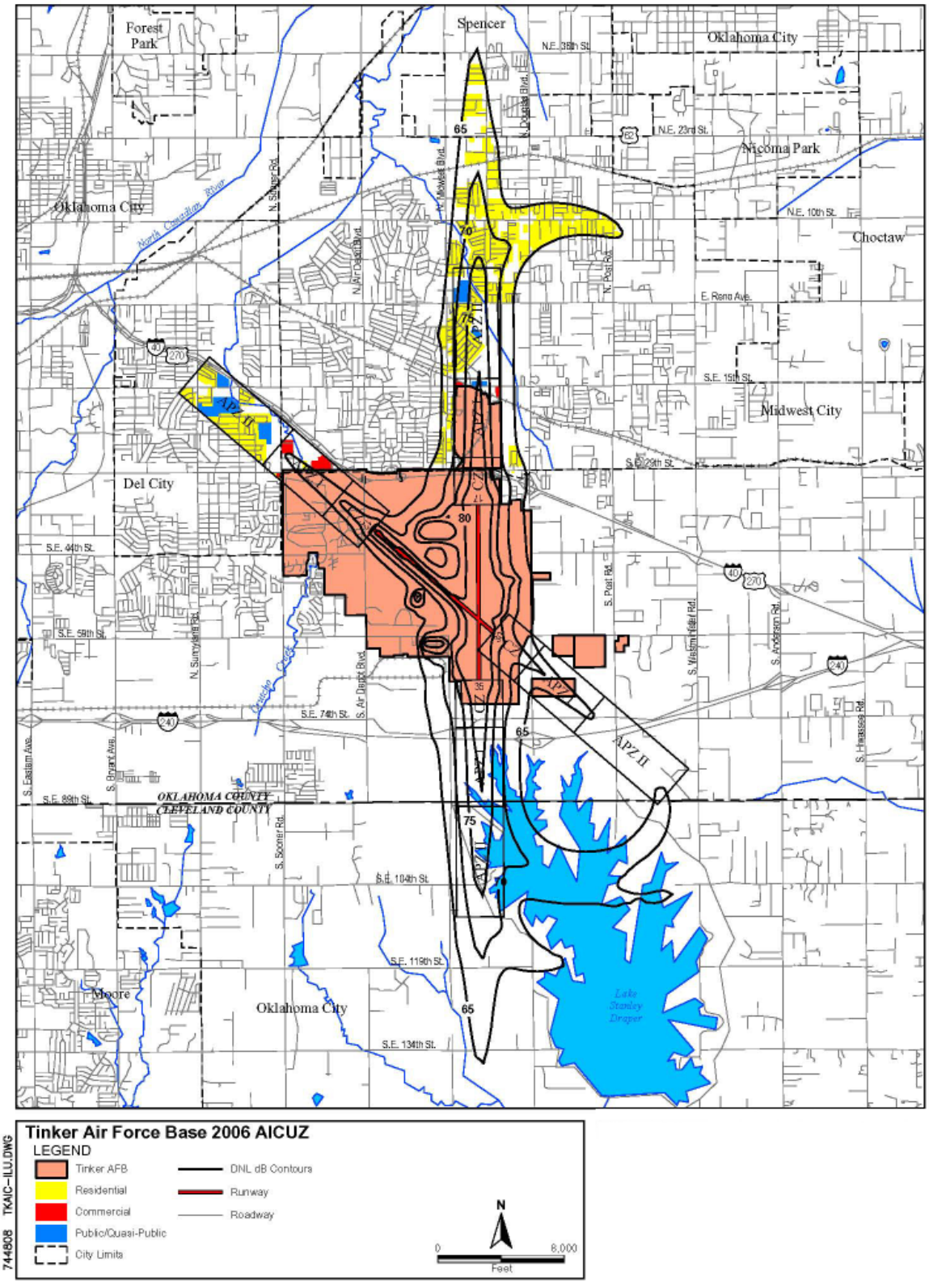
Table 4.2 Incompatible Land Use for Runways 17/35 and 12/30 at Tinker AFB

Category	Acreage Within CZs and APZs			Acreage Within Noise Zones, Not Included in CZs and APZs				Total
	CLEAR ZONE	APZ I	APZ II	65-69	70-74	75-79	80+	
Residential	•	4	409	676	164	8	•	**1,261**
Commercial	•	41	•	1	•	•	•	**42**
Industrial	•	•	•	•	•	•	•	**0**
Public/Quasi-public	•	4	121	5	•	•	•	**130**
Recreation/Open/ Agricultural/Low Density	•	•	•	•	•	•	•	**0**
Total	**0**	**49**	**530**	**682**	**164**	**8**	**0**	**1,433**

• Represents compatible land use

Source: 2006 AICUZ Study for Tinker AFB

Figure 4.3 Incompatible Land Use



Source: 2006 AICUZ Study for Tinker AFB

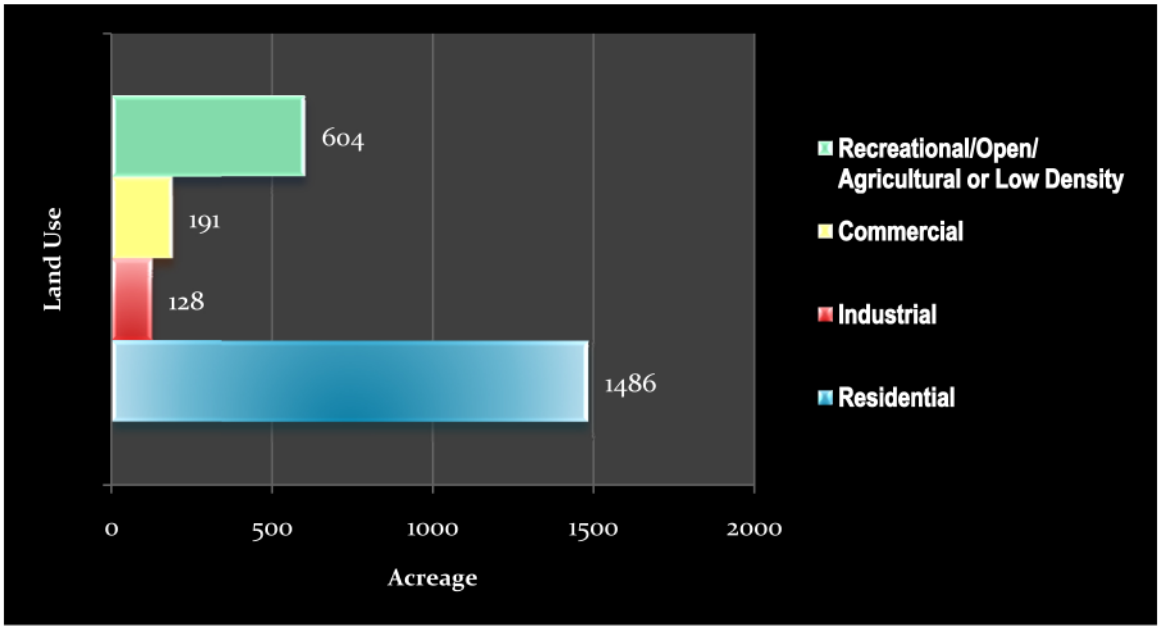
4.5.2.b Existing Zoning within the AICUZ Planning Zones

Due to the number of jurisdictions within the AICUZ study area and the various zoning district names, land use zoning was grouped and generalized as follows:

- **Residential:** includes all types of residential activity, such as single and multi-family residences and mobile homes, at a density greater than one dwelling unit per acre.
- **Commercial:** includes offices, retail, restaurants and other types of commercial establishments.
- **Industrial:** includes manufacturing, warehousing, and other similar uses.
- **Public/Quasi-Public:** includes publicly owned lands and/or land to which the public has access, including military reservations and training grounds, public buildings, schools, churches, cemeteries, and hospitals.
- **Recreational:** includes land areas designated for recreational activity including parks, wilderness areas and reservations, conservation areas, and areas designated for trails, hikes, camping, etc.
- **Open/Agricultural/Low Density:** includes undeveloped land areas, agricultural areas, grazing lands and areas with residential activity at densities less than or equal to one dwelling unit per acre.

Figure 4.4 illustrates the amount of acreage within each of the generalized land use zoning districts surrounding Tinker AFB.

Figure 4.4 Land Use Within the AICUZ Accident Potential Zones (CZ/APZ I and II)



Source: 2006 AICUZ Study for Tinker AFB

Inclusion of the CZs and APZs in the evaluation revealed that 1,486 acres of the 2,409 total acres were classified as residential within the Tinker AFB AICUZ Planning Zones.

4.5.2.c Land Use Classification Systems

It is noteworthy that all three municipalities surrounding Tinker Air Force Base utilize the Standard Industrial Classification (SIC) system for determining land use classifications within their respective jurisdictions. The SIC code was introduced in the 1930s and has been periodically revised to reflect the economy's changing industrial composition and organization. The Standard Land Use Coding Manual (SLUCM) was introduced in 1965 and last updated in 1987. It is the standard land use classification system used by the military. There is not a clear conversion system from the SLUCM system to the SIC system. This results in potential confusion between appropriate land use classifications and definitions in the application of the Air Force's recommendations of compatible land use.

Table 4.3 Land Use Compatibility Guidelines

Land Use		Accident Potential Zones			Noise Zones in DNL dB			
SLUCM No.	Name	Clear Zone	APZ I	APZ II	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; semidetached	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; one above the other	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	N	N
15	Transient lodgings	N	N	N	A[11]	B[11]	C[11]	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	Y	Y	Y[12]	Y[13]	Y[14]

Source: 2006 AICUZ Study for Tinker Air Force Base

Table 4.3 Land Use Compatibility Guidelines (*cont.*)

Land Use		Accident Potential Zones			Noise Zones			
SLUCM No.	Name	Clear Zone	APZ I	APZ II	65-69	70-74	75-79	80+
30	**Manufacturing**							
31	Rubber and misc. plastic products, manufacturing	N	N[2]	N[2]	Y	Y[12]	Y[13]	Y[14]
32	Stone, clay and glass products manufacturing	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; manufacturing	N	N[2]	Y	Y	Y[12]	Y[13]	Y[14]
35	Professional, scientific, and controlling instruments; photographic and optical goods; watches and clocks manufacturing	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-of-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

Source: 2006 AICUZ Study for Tinker Air Force Base

Table 4.3 Land Use Compatibility Guidelines (*cont.*)

Land Use		Accident Potential Zones			Noise Zones			
SLUCM No.	Name	Clear Zone	APZ I	APZ II	65-69	70-74	75-79	80+
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
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

Source: 2006 AICUZ Study for Tinker Air Force Base

Table 4.3 Land Use Compatibility Guidelines (*cont.*)

Land Use		Accident Potential Zones			Noise Zones			
SLUCM No.	Name	Clear Zone	APZ I	APZ II	65-69	70-74	75-79	80+
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 sports 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 to 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]	N	N
83	Forestry 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	Mining 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

Source: 2006 AICUZ Study for Tinker Air Force Base

Table 4.3 Land Use Compatibility Guidelines Legend

LEGEND

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 1-21.
N^x - (no with exceptions) - See notes 1-21.
NLR - (Noise Level Reduction) - NLR (outdoor to indoor) to be achieved through incorporation of noise attenuation measures into the design and construction of the structures.

A, B, or C - Land use and related structures generally compatible; measures to achieve NLR of A (DNL 25 dB), B (DNL 30 dB), or C (DNL 35 dB) 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 individual federal agency and program 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.

NOTES

1. Suggested maximum density of 1-2 dwelling units per acre possibly increased under a Planned Unit Development where maximum lot coverage is less than 20 percent.
2. Within each land use category, uses exist where further definition may be needed due to the variation of densities in people and structures. Shopping malls and shopping centers are considered incompatible in any accident potential zone (CZ, APZ I, or APZ II).
3. The placing of structures, buildings, or aboveground utility lines in the clear zone is subject to severe restrictions. In a majority of the clear zones, these items are prohibited. See AFI 32-7063 and UFC 3-260-01 for specific guidance.
4. No passenger terminals and no major aboveground transmission lines in APZ I.
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. Facilities must be low intensity.
9. Clubhouse not recommended.
10. Areas for gatherings of people are not recommended.

11A. Although local conditions may require residential use, it is discouraged in DNL 65-69 dB and strongly discouraged in DNL 70-74 dB. An evaluation should be conducted prior to approvals, indicating a demonstrated community need for residential use would not be met if development were prohibited in these zones, and there are no viable alternative locations.

11B. Where the community determines the residential uses must be allowed, measures to achieve outdoor to indoor NLR for DNL 65-69 dB and DNL 70-74 dB should be incorporated into building codes and considered in individual approvals.

11C. NLR criteria will not eliminate outdoor noise problems. However, building location and site planning, and design and use of berms and barriers 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.

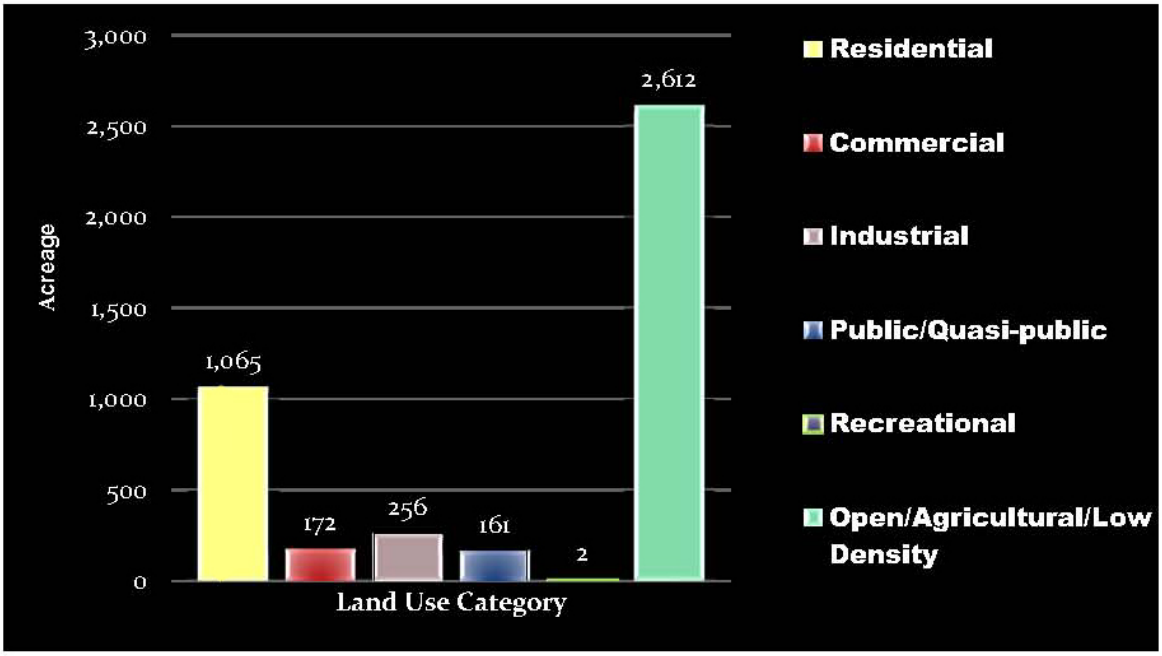
12. Measures to achieve the same NLR as required for facilities in the DNL 65-69 dB range must be incorporated into the design and construction of portions of these buildings where the public is received, office areas, noise sensitive areas, or where the normal noise level is low.
13. Measures to achieve the same NLR as required for facilities in the DNL 70-74 dB range 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.
14. Measures to achieve the same NLR as required for facilities in the DNL 75-79 dB range 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.
15. If noise sensitive, use indicated NLR; 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 required for facilities in the DNL 65-69 dB range.
19. Residential buildings require the same NLR required for facilities in the DNL 70-74 dB range.
20. Residential buildings are not permitted.
21. Land use is not recommended. If the community decides the use is necessary, personnel should wear hearing protection devices.

Source: 2006 AICUZ Study for Tinker Air Force Base

4.5.2.d Existing Land Uses within DNL 65dB Noise Contour

Of the 3,710 acres within the DNL 65 -70 dB Noise Contour outside the Base, 1,065 acres or 29% were residential. A summary of acreage in all land use categories is shown in Figure 4.5.

Figure 4.5 Land Use Categories (In Acres) Within 65+ dB Noise Contour



Source: 2006 AICUZ Study for Tinker AFB

The 2006 AICUZ Study also determined that certain existing uses not included in the APZs and CZs are incompatible within the 65+ dB DNL noise contour. Details of these potentially incompatible uses (existing structures) contained within the noise contours were summarized as follows:

• In the **65 dB – 69 dB DNL:** Approximately 676 acres were residential, one acre was commercial and five acres were public/quasi-public.

• In the **70 dB – 74 dB DNL:** Approximately 164 acres were residential.

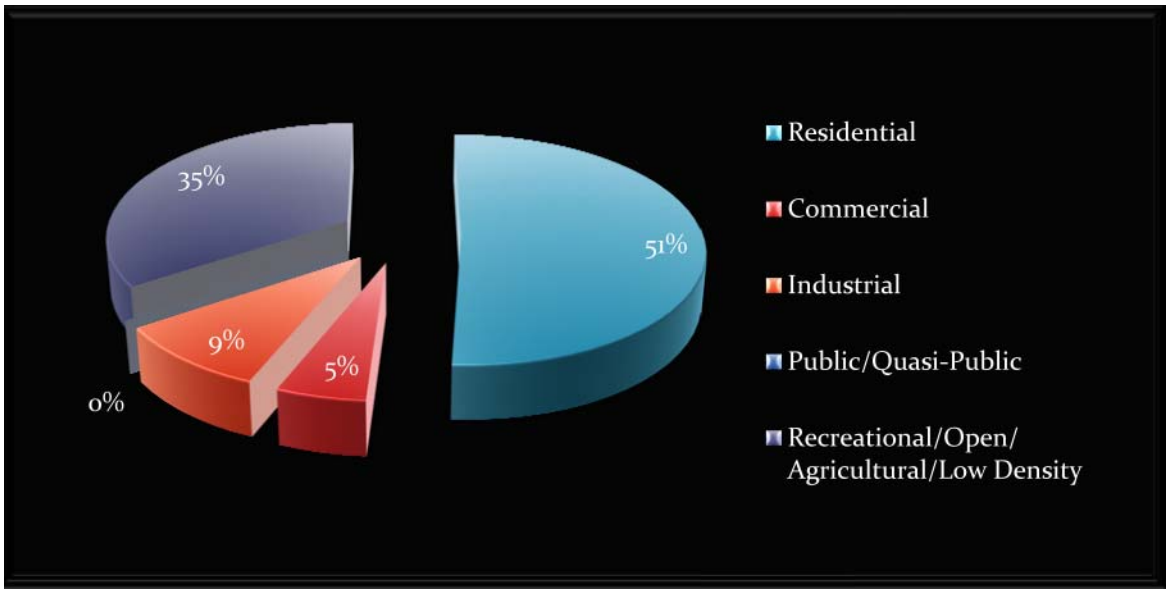
• In the **75 dB DNL or greater:** Approximately eight acres were residential.

This would mean that approximately 217 acres within the 65+ dB DNL classified as residential remained undeveloped outside the APZs at the time of the study.

4.5.2.e Existing Zoning within DNL 65 dB Noise Contour

The 65 dB DNL is the federally defined threshold level at which aircraft noise begins to interfere with everyday activities, such as talking on the phone or watching TV.

Figure 4.6 Zoning Classification Percentages Within 65+ dB Noise Contour



Source: 2006 AICUZ Study for Tinker AFB

The areas that are within the 65 dB DNL contour are where land use and noise abatement measures would likely have the most benefit. These are the areas in which elements such as sound insulation would be eligible for federal participation.

As shown in Figure 4.6, more than half of the AICUZ area was zoned residential. Incompatible residential uses included some single-family residences in APZ I and a portion of the Kristie Manor apartment complex to the northwest of the Base.

4.5.2.f Summary of 2006 AICUZ Study and Existing Land Uses

The AICUZ Study's land use guidelines do not recommend residential uses within the CZ or APZ I and recommend only single-family detached units at a density of one to two dwelling units per acre in APZ II. Existing residential areas are predominantly platted and zoned for a minimum of 6,000 square foot lots at a density in excess of two dwelling units per acre. Section VII of this report recommends standards for ensuring future low density residential, commercial and industrial development within the AICUZ APZs.

4.5.2.g Summary of 2006 AICUZ Study and Future Land Uses

The developed areas within Midwest City and Del City are expected to maintain their mixture of residential, commercial, and public uses. Any development in these areas is likely to consist of infill and redevelopment. Consequently, future land use patterns north and northwest of the installation will reflect existing land use patterns. Continued commercial development is anticipated to occur along the major corridors of I-40, SE 15th Street, SE 29th Street, Air Depot Boulevard, and Midwest Boulevard. Areas within the AICUZ accident or noise zones should be developed in accordance with the AICUZ guidelines on land use compatibility. An 82-acre commercial center along SE 29th Street, between Air Depot and Midwest Boulevards, in Midwest City, is under development and is not located within an APZ or noise contour. This new retail area will offer over 600,000 square feet of building space.

4.6 General Effects of Incompatible Land Uses

Incompatible land uses are regarded as those whose cumulative impact puts pressure on military installations and the surrounding communities. The result is increasing environmental controls, regulatory burdens, and competition for air, land, water, energy, radio spectrum, and other resources. The burden imposed on military bases by intense development impacts not only developers and local communities but also military readiness. DoD requires continued, unobstructed access to those lands it occupies to train its soldiers, sailors, and airmen; test its weapon systems and equipment; and maintain mission readiness. Inappropriate land use limits the Military's ability to fully use its training and testing facilities for their intended purposes and increases the potential for negative effects on surrounding state and local jurisdictions.

Incompatible land uses inside the APZ
Two schools are shown inside this APZ II. Schools, along with other public facilities, are considered incompatible land uses by the DoD. (Source: Google Earth.)

At the same time, military training and testing activities can impose on the local communities. DoD operations and environmental footprints often extend to lands which DoD does not own or control. State and local governments maintain responsibility for land use planning (local), environmental regulation (state) and enforcement (both). The sharing of air, land, and water resources dictates the need for partnerships between the three primary stakeholders; the military, regional/state/local regulatory agencies, and local land use jurisdictions.

Inappropriate land development pressures boil down to a competition for scarce resources. Resources such as land continue to diminish in availability, financial resources of state and local governments will always be limited. Regulatory environments continue to be more stringent. Some factors include wilderness designations, cultural sites, unexploded ordnance and constituents, commercial development, population encroachment, maritime issues, air quality, water quantity and quality, noise abatement, air space congestion and competition, and endangered species and wildlife habitat.

At the moment, depleting availability of land and the increasing urbanization, growth and development surrounding military facilities is the primary short term focus. Understanding of state and local executive jurisdiction and coordination across the broad spectrum of state and local agencies is critical. Solutions need not entirely restrict the use of resources; rather they must ensure “compatible” use. Most importantly, however, solutions must be proactive in order to prevent development problems before they occur.

Depending upon whether the potential impact relates to noise or safety, different actions are available to address incompatibility. This study provides information for each community to use to examine their compatibility with the surrounding environs and work with the State and Tinker AFB to eliminate encroachments. See Appendix G for the State of Oklahoma law that addresses these matters.

4.6.1 Incompatible Land Uses

Identified in the 2006 AICUZ Study are compatible land uses for both noise and accident potential as shown in Table 4.3. Many of the incompatible uses have a higher density than is currently recommended by the Air Force.

It should be noted that the addition of an APZ II to the Crosswind Runway in the 2006 AICUZ Study rendered many existing land uses incompatible. The U.S. Air Force recognizes this and considers all pre-existing land uses to be grandfathered, as stated in the following excerpt from the AICUZ Study:

"*Tinker AFB has included the Runway 12/30 APZs II in this AICUZ Study with the understanding that existing land uses are grandfathered. While the land uses are incompatible based on new AICUZ land use recommendations, Tinker AFB does not expect or request structures be removed. For all intents and purposes, the land uses are considered pre-existing conditions. This recommended APZ II criteria is intended to apply to new development/future redevelopments only.*"

Source: 2006 AICUZ Study

Existing multifamily, townhouse and duplex development became incompatible uses as a result of applying APZ II to the Crosswind Runway due to the concentration of people in a relatively small area.

4.7 2006 AICUZ Recommendations

Noise measurement techniques for the 2006 AICUZ Study are based on recent technology. Data from this study should be considered for incorporation into existing land use plans and ordinances of surrounding communities, and as a basis for decisions on future land development applications.

APZ I, although not as significant as the CZ, possesses a risk factor. This 3,000 foot by 5,000 foot area has land use compatibility guidelines which are sufficiently flexible to allow reasonable economic use of the land, such as industrial/manufacturing, transportation, communication/ utilities, wholesale trade, open space, recreation, and agriculture. However, uses that concentrate people are not recommended (pg. A-7 of the 2006 AICUZ Appendices).

The APZ IIs risk factor is less than APZ I, but still possesses potential for accidents. APZ II is 3,000 feet wide and 7,000 feet long extending to 15,000 feet from the runway threshold. Acceptable uses include those of APZ I, as well as low density single-family residential and personal and business services and commercial/retail trade uses of low intensity or scale of operation. High density functions such as multistory buildings, places of assembly (theaters, churches, schools, restaurants, etc.), and high density office uses are not considered appropriate (pg. A-7 of the 2006 AICUZ Appendices).

Synopsis of the 2006 AICUZ recommendations are as follows:

- Continue to incorporate AICUZ policies and guidelines into the comprehensive plans of Oklahoma County and the cities of Oklahoma City, Midwest City, Del City and Spencer.
- Use overlay maps of the AICUZ noise contours, APZs, and Air Force Land Use Compatibility Guidelines to evaluate existing and future land use proposals
- Modify existing zoning ordinances and subdivision regulations to support the compatible land uses outlined in this study
- Modify building codes to ensure new construction within the AICUZ noise contours has the recommended noise level reductions incorporated into its design and construction
- Implement height and obstruction ordinances which reflect current Air Force and FAR Part 77 requirements
- Keep Tinker AFB apprised of any development near the Base that may impact its missions
- Continue to inform Tinker AFB of planning and zoning actions that have the potential of affecting Base operations
- Support the Tinker JLUS to protect the Base from encroachment

It is recognized that the public must be protected from noise and other hazards of air base operations. At the same time it is recognized that lands near air bases often are highly attractive areas for development. Aircraft operations are likely to continue from Tinker AFB for the indefinite future. The types of aircraft, flight tracks, frequency, and other characteristics will be continuously evaluated by Tinker AFB to determine the effects on the community.

SECTION V
Compatibility Factors

Lake Stanley Draper
Some tracts of land close to Tinker AFB remain undeveloped.
Source: Picture submitted to www.outdoorsok.com by Ellis Evans.

5.1 Acronyms and Abbreviations

ACOG	Association of Central Oklahoma Governments
AE	Airport Environs
AeroEOC	Aerospace Eastern Oklahoma County
AFB	Air Force Base
AFGP	Air Force General Plan
AICUZ	Air Installation Compatible Use Zone
APZ	Accident Potential Zone
CZ	Clear Zone
CRP	Community Relations Plan
dB	decibel
dBA	A-weighted sound level measured in decibels
DNL	Day-Night Average A-Weighted Sound Level
DoD	U.S. Department of Defense
EPA	U.S. Environmental Protection Agency
FAA	Federal Aviation Administration
FAR	Federal Aviation Regulations
FAR	Floor Area Ratio
IBC	International Building Code
IRP	Installation Restoration Program
JLUS	Joint Land Use Study
MAP	Management Action Plan
MROTC	Maintenance Repair and Overhaul Technology Center
NLR	Noise Level Reduction

OC-ALC	Oklahoma City Air Logistics Center
OCARTS	Oklahoma City Area Regional Transportation Study
ODOT	Oklahoma Department of Transportation
PUD	Planned Unit Development
SLUCM	Standard Land Use Coding Manual
SQSS	Southwest Quadrant Stabilization System
TDR	Transfer of Development Rights
the Base	Tinker AFB

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5.2 History of Land Use Compatibility Planning

Planners at Tinker Air Force Base (AFB) have developed and nurtured a responsible, proactive and cooperative environment with residents and community planners of the surrounding local governments. These local governments are actively involved with and belong to the Association of Central Oklahoma Governments (ACOG). ACOG provides support and facilitates understanding in planning practices and fosters an atmosphere of cooperation in the coordination of sound and responsible regional planning and development.

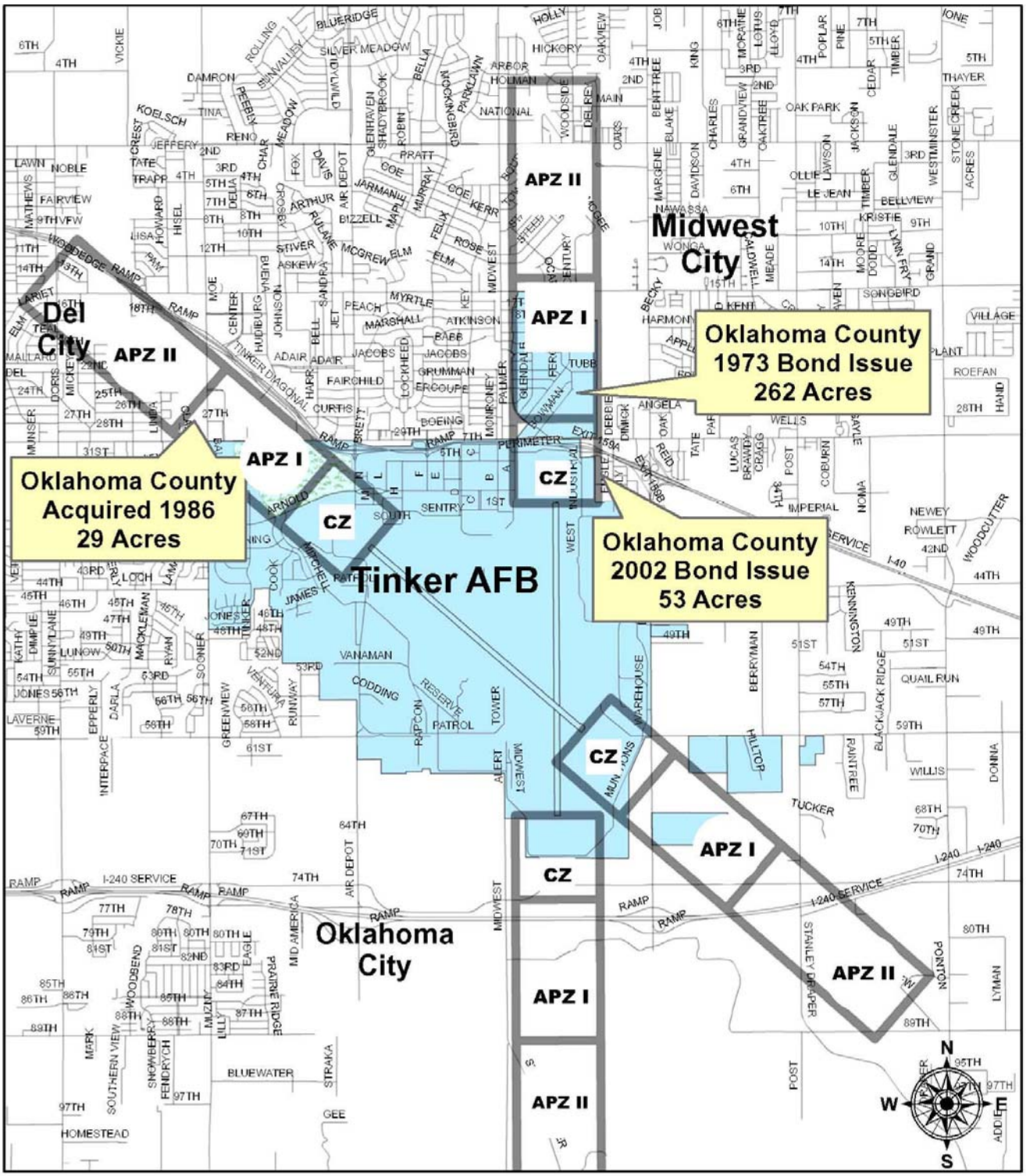
Top-3 Volunteers
Members of the Tinker's Top-3 Organization volunteered with Central Oklahoma Habitat for Humanity to get three houses ready to be dedicated. Habitat for Humanity volunteer coordinator said they could not have stayed on schedule without the Tinker Top-3's efforts. (Courtesy photo)

Adjacent communities have worked with the AFB to identify potential and real land use conflicts that may have an adverse effect on the Base's mission. An example of this identification process is the fate of the former Glenwood residential subdivision built in the northern Accident Potential Zone (APZ) I. In 1973, a large portion of the subdivision, comprising 262 acres north of the Base in Midwest City, was purchased by Oklahoma County and leased back to the AFB. The land, located in the northern APZ I, was cleared of approximately 836 houses and remains undeveloped.

Subsequently, in 1986, the county purchased 29 acres in an APZ I area to prevent development of a shopping center, and Oklahoma County bond funds were used in 2002 to acquire and demolish additional properties in the northern Clear Zone (CZ) and APZ I area of the main runway.

In like manner, Midwest City and Del City have diligently worked to preserve and protect the APZ I. The land acquisitions by Oklahoma County are illustrated in Figure 5.1. For more information about actions by Oklahoma County and these two cities, please refer to Sections 1.4, 1.5 and 1.6.

Figure 5.1 Community Support - Land Acquisition within CZ and APZ I



Source: Created from Data Received from ACOG and Tinker AFB

5.2.1 Tinker AFB General Plan

The Air Force General Plan (AFGP) is the primary document that provides an Air Force installation commander and other military decision makers with a consolidated picture of whether an installation has the physical assets and delivery systems necessary to support its mission. The document provides a general assessment of the installation's infrastructure and resources for the purpose of gauging the installation's development and growth potential.

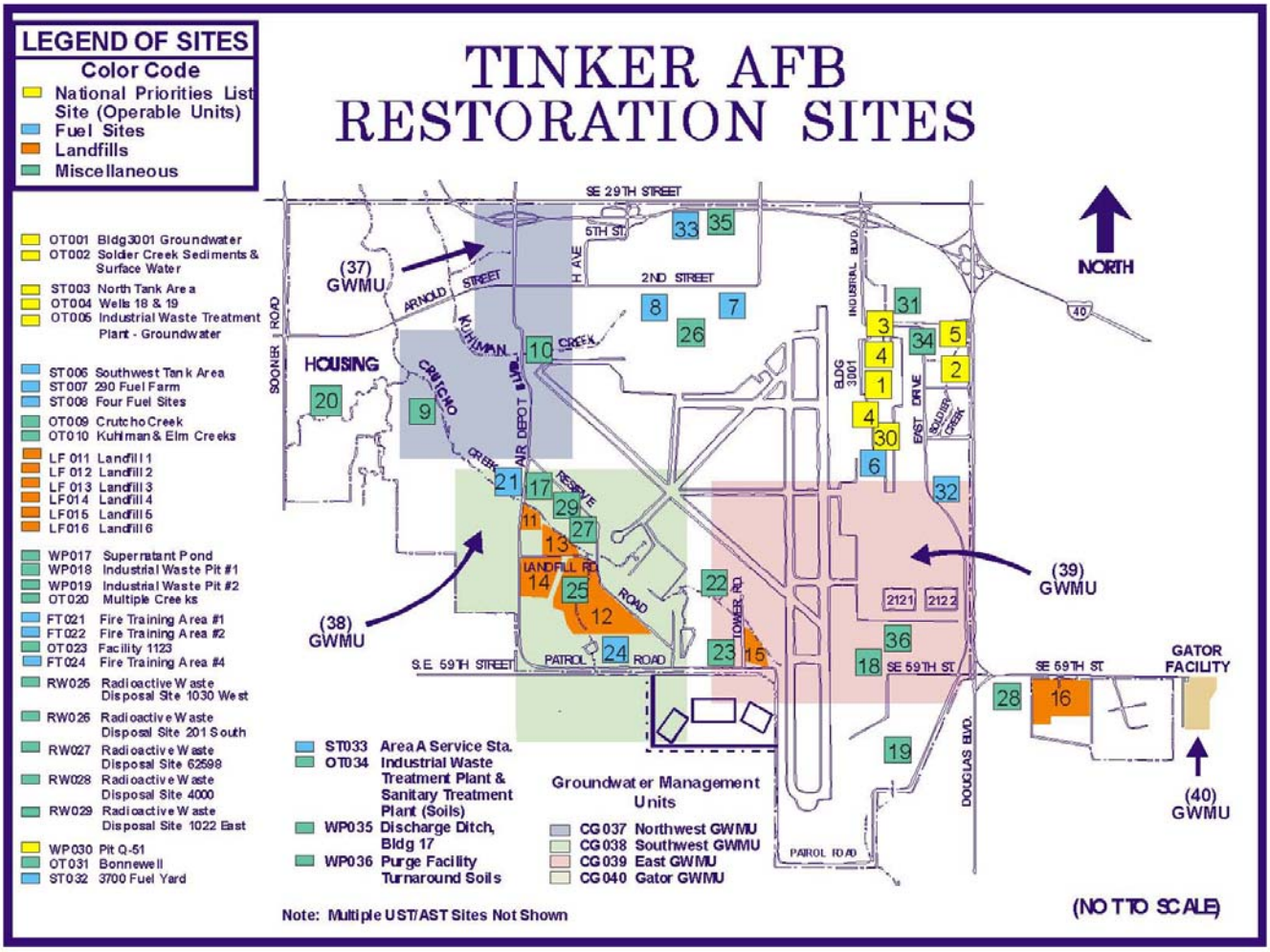
The Tinker AFB General Plan is a comprehensive master planning document which guides on-base development. It analyzes existing land uses and their functional relationships, makes recommendations for future land use changes, identifies development constraints and opportunities, and gives a focused vision of future development in key areas. In addition to assessing the Base's ability to support its missions, the plan's findings also include a recommendation for Tinker AFB to continue to work with the local governments to implement the recommendations contained within this Joint Land Use Study (JLUS).

5.2.2 Management Action Plan and Community Relations Plan

From an initial plan size of 960 acres in 1941, Tinker has grown to 5,020 acres with approximately 15.5 million square feet of floor space in over 700 buildings, 136 acres of indoor maintenance area, and 254 acres of ramp area. The Base serves as a repair depot for a variety of aircraft, weapons, and engines. Repair activities require the use of hazardous materials and result in generation of hazardous wastes including solvents, paint strippers, various industrial wastewaters, and sludges.

The Base properties, situated within the North Canadian River drainage basin, drain into the Crutcho and Soldier Creeks and overlay a complex aquifer system that includes the Garber-Wellington Formation. The Southwest Quadrant Stabilization System (SQSS) area includes two landfills that were used sporadically over a 40-year span for the disposal of household and industrial wastes, including paints and solvents. Starting in the mid-1980s, remediation work has been performed at 40 locations on the Base such as landfills, waste pits, fire training areas, and spill sites.

Figure 5.2 Tinker AFB Restoration Sites



Source: 2004 Tinker AFB Management Action Plan (MAP)

This Management Action Plan (MAP) was created in order to integrate and coordinate the environmental remediation and cleanup activities required at Tinker AFB. The MAP summarizes the status of the restoration efforts and identifies specific program issues to enhance remediation strategies. Actions taken to date have included contaminated soil removals, landfill caps, and pump and treat systems.

Along with the MAP, the Community Relations Plan (CRP) was also created. The purpose of the CRP was to inform effectively interested citizens about the ways in which they may participate in the restoration process. This CRP was designed as a planned approach to establishing and maintaining two-way communications between the Base and the surrounding communities during what are often lengthy and complex processes.

An interactive communication process enables the community and those implementing the Installation Restoration Program (IRP) at the Base to convey information to each other. It is designed to provide responses to questions and concerns and formulate more responsive actions. Thus, community relations activities benefit both local citizens and the Base by providing all interested parties with insight and first-hand information on the continuing IRP efforts.

The CRP defines a dynamic program covering all stages of corrective action, including the investigation, planning, and implementation phases which are responsive to technical developments and the concerns of the public. It maps out a recommended course of action that Tinker AFB environmental planning staff should implement to facilitate public involvement. It is important, when changes in land use or land use controls are being considered either on or off the installation, that the installation and the surrounding communities be informed and given the opportunity to comment on any resulting impacts on training capabilities or quality-of-life issues respectively. The CRP states that review of permit applications, issuance of permits and administrative orders, permit modifications, implementation of corrective action programs, and approval of closure plans are activities that should require varying degrees of public involvement with opportunities for all voices to be heard.

5.3 Aerospace Eastern Oklahoma County

Aerospace Eastern Oklahoma County (AeroEOC) is a regional partnership created to brand, promote, and grow the considerable Maintenance, Repair and Overhaul (MRO) and aerospace assets located in Eastern Oklahoma County, especially in and around Tinker AFB and its Oklahoma City Air Logistics Center (OC-ALC). AeroEOC was formed in 2005 by a group of business, military and government leaders with the unified goal of preserving Tinker AFB.

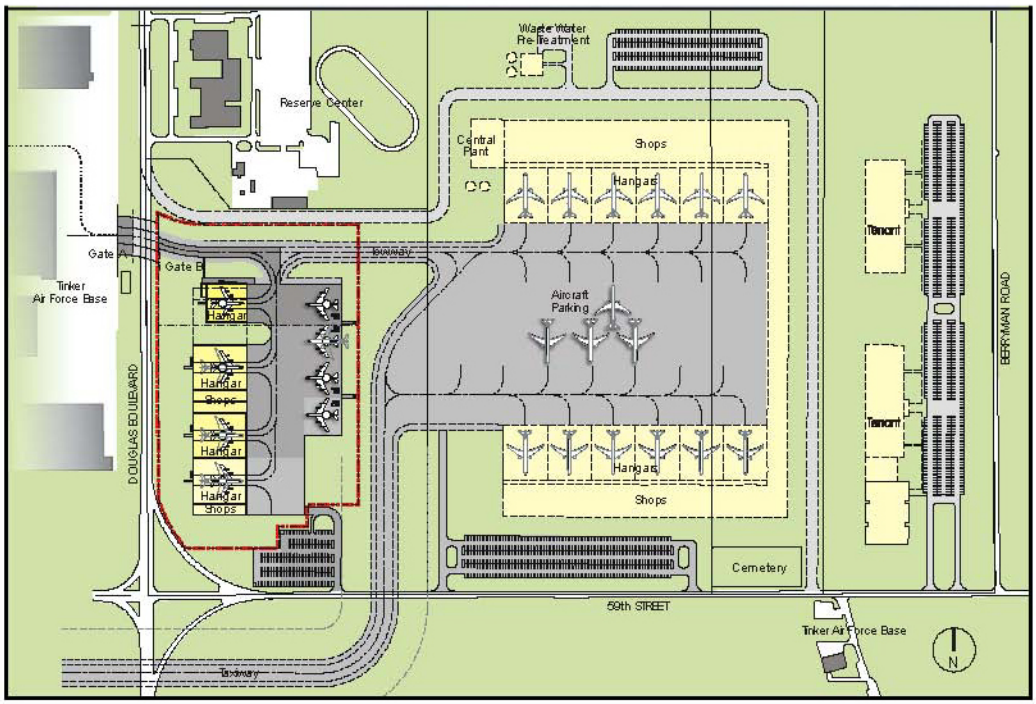
AeroEOC believes additional influences and processes have the potential to significantly impact and increase the MRO and Aerospace businesses located in and around Tinker AFB in Eastern Oklahoma County.

AeroEOC seeks global recognition and valued brand identity for Eastern Oklahoma County's MRO and aerospace assets through greater collaboration/synergy among existing AeroEOC organizations. Retention and growth of business opportunities and recruitment and development of new aerospace and MRO related businesses are included in its goals.

AeroEOC Milestones

- Tinker 2010 Executive Committee selected Battelle to develop the master plan and business strategy for the MROTC
- Battelle, with community and industry leaders, briefed Air Force Asst. Secretary and Materiel Command on concept and vision
- Oklahoma Industries Authority (OIA) placed Battelle OK on contract to develop, build, lease, operate and manage the MROTC
- Tinker signed a memo stating AF interest in the MROTC and approval of license to construct towway segment on Tinker
- Oklahoma City, Oklahoma County, and The State of Oklahoma agreed to assist in towway construction

Figure 5.3 Oklahoma MROTC Master Plan — Full Development



Source: http://www.aeroeoc.com/pdf/MRO_web.pdf

5.4 General Compatibility and Comprehensive Plans

The purpose of a Comprehensive Plan is to identify goals, objectives and the policies necessary to achieve them. Goals and policies are meaningless unless there is concurrence on and commitment to the methods to be used toward their achievement. These plans serve to identify major implementation needs and to document the techniques which can be used to implement them. The implementation methods include four broad approaches: (1) regulation of real estate development; (2) construction improvement programs; (3) fiscal assessment and implications of needed improvements and services; and (4) execution of the various processes and procedures necessary for the jurisdiction's planning, development, and operational functions. These approaches are intertwined.

A Comprehensive Plan has been adopted and utilized by most of the communities within the JLUS study area with the exception of Nicoma Park, Spencer and Cleveland County. [Choctaw has a General Plan but it was not assessed as a part of the JLUS due to its distance from Tinker AFB.]

All local governments within the JLUS study area should consider adoption of a comprehensive or general plan to facilitate long term encroachment mitigation strategies.

5.5 General Compatibility and Zoning

A zoning ordinance sets forth what can be done and delineates the development constraints, while the Comprehensive Plan provides general direction for the future of the community. Even though a zoning ordinance is designed to implement the information in a Comprehensive Plan, the zoning ordinance and the plan are not likely to remain identical.

Conformity between a zoning ordinance and the Comprehensive Plan should be maintained over time. Any proposed amendment to a zoning ordinance should be checked against the plan. If necessary, the plan should be amended when the zoning ordinance is amended. Conversely, if the plan is amended, the zoning ordinance should be examined for possible amendment.

5.6 Del City Comprehensive Plan Evaluation

The existing Del City Comprehensive Plan for 1985-2005 does not address the 1976 Air Installation Compatible Use Zone (AICUZ) Study completed for Tinker AFB nor has the plan been amended to include more recent AICUZ updates. However, Del City has been using Interim Development Regulations for parcels within the new Accident Potential Zone II of Runway 12/30 of Tinker Air Force Base to evaluate land use plans being presented by developers. Updates to this municipality's Comprehensive Plan are now being formulated and should be finalized upon completion of this JLUS. Del City desires to incorporate JLUS recommendations contained herein into its new Comprehensive Plan. Del City supports land use planning efforts of the AICUZ Study and recommends that the city: continue to incorporate AICUZ policies and guidelines as necessary, modify ordinances to support AICUZ as deemed necessary, modify building codes to support AICUZ as deemed necessary and implement height and obstruction ordinances.

5.6.1 Del City Zoning Ordinance Evaluation

Del City utilizes a conventional Zoning Ordinance, which was amended in October 2005, to incorporate an airport overlay district under Section 430 of the Del City Zoning Code. Under this section, development within APZ I and APZ II is more closely monitored. The Zoning Ordinance addresses densities of residential development as well as non-residential intensities within these zones.

Based on the 2006 AICUZ Study and the expectations of land use recommendations coming forth from the 2008 JLUS, Del City made the decision to adopt on Nov. 19, 2007, interim development regulations to guide development activities on a short-term basis. The interim development regulations represent the City's best effort to regulate development within the APZ II zone of the crosswind runway (Runway 12/30) in such a manner as to restrict the establishment and growth of uses and structures that could create an encroachment on Tinker AFB.

5.6.2 Del City and Runway 12/30 APZ II

Table 4.3 of this JLUS (Table 4.3 of the 2006 AICUZ Study) suggests that retail trade-general merchandise and retail uses generally are compatible within APZ II. However, footnote 2 states: "*Within each land use category, uses exist where further definition may be needed due to the variation of densities in people and structures. Shopping malls and shopping centers are considered incompatible in any Accident Potential Zone (CZ, APZ I, or APZ II).*"

The Merriam Webster On-Line Dictionary defines:

> Shopping Center: a group of retail stores and service establishments usually with ample parking facilities and usually designed to serve a community or neighborhood.

Del City has plans for retail trade-general merchandise to be constructed at the southwest corner of the intersection of I-40 and Sooner Road. This location is within the boundaries of APZ II of Runway 12/30. No APZ II has ever existed over Del City prior to the 2006 AICUZ Study for Tinker AFB. It is noted that the Del City development was well underway prior to the 2006 AICUZ Study being published and Del City considers it a pre-existing condition.

5.7 Midwest City Comprehensive Plan Evaluation

According to information obtained from Midwest City staff, the City is currently in the process of preparing a new Comprehensive Plan that will replace the 1985 Plan. Though not completed at the time this JLUS report was prepared, a draft of the new Comprehensive Plan was available for review. Similar to the 1985 Plan, the 2008 Comprehensive Plan contains many references to Tinker Air Force Base. The Land Use Plan map reflects the AICUZ for both runways. Among other recommendations, the draft Plan contains the following narrative:

> "*Midwest City supports land use planning efforts of the AICUZ Study and recommends that the City:*
>
> - *Continue to incorporate AICUZ policies and guidelines into the comprehensive plan;*
> - *Modify ordinances to support AICUZ study, as deemed necessary;*
> - *Modify building codes to support AICUZ study, as deemed necessary;*
> - *Implement height and obstruction ordinances;*
> - *Keep Tinker AFB apprised of any adjacent development;*
> - *Inform Tinker AFB of planning and zoning decisions that have potential of affecting base operations;*
> - *Support the Joint Land Use Study (JLUS) for the Tinker AFB area to protect the area from encroachment.*"

It is expected that the 2008 Comprehensive Plan will contain further recommendations stemming from the JLUS report or some form of an addendum to the 2008 Plan will occur after completion of the JLUS effort.

5.7.1 Midwest City Zoning Code Evaluation

Appendix B of the existing Code of Ordinances for Midwest City addresses the APZ I and the CZs for Runways 12/30 and 17/35. Airport Environs Zones for APZ I and the CZs have been adopted as follows:

Midwest City
Oklahoma Welcome Center
Source: www.midwestcityok.org

> *"Accident potential zone is based on past Air Force aircraft accidents and installation operational data. It is less critical than the clear zone but still possesses a significant risk factor. For Runway 12/30, this zone is an area beginning at the end of the clear zone and is three thousand (3,000) feet in width and five thousand (5,000) feet in length. For Runway 17/35, this zone is an area beginning at the end of the clear zone…*
>
> *Clear zone is established for each runway. For Runway 12/30 the clear zone has a width of two thousand (2,000) feet and a length of three thousand (3,000) feet beginning at the end of the runway. The clear zone for Runway 17/35 begins at the end of the runway and is an area of land lying in the South Half of Section 11, Township 11 North, Range 2 West and the North Half of Section 14, Township 11 North, Range 2 West."*

The Zoning Ordinance addresses densities of residential and nonresidential development within these zones. Various requirements of the Airport Zoning codes, also known as the Tinker AFB Zoning Ordinance, can be found in several other sections of the city's code of ordinances, including the city's sign regulations, manufactured homes regulations, and building regulations. Development within APZ II is not addressed.

Although Tinker AFB has its own "zoning ordinance" within Midwest City's Airport Zoning codes, these regulations are based on data from 1983, with the most recent amendment in 1993. **Today, these zones should be redesigned with the APZ zones as delineated in the 2006 AICUZ Study to reflect a width of 3,000 feet for the Clear Zone. The proposed zoning districts should similarly regulate uses, lot coverage, density, setbacks, building heights, etc. and should have a direct relationship to Midwest City's Comprehensive Plan.**

5.7.2 Midwest City APZ I Boundary for Runway 17/35

Midwest City's legal description of APZ I [Section 4. Definitions. 1. Accident Potential Zone, Appendix B Airport Zoning-Midwest City] is inconsistent with the definition described in the AICUZ Study. Midwest City should amend its legal description of APZ I to be consistent with the description from the AICUZ. [Midwest City describes the Runway 17/35 APZ as 4,450 feet long as compared to the AICUZ length of 5,000 feet].

Note, there is no dimension of 5,000 feet in this description from the the Midwest City Zoning Ordinance. The ordinance states that it only goes to 15th Street. Runway 17/35 APZ I is described as follows:

> "*Commencing at the Southeast Corner of the Southwest Quarter of Section 11, Township 11 North, Range 2 West, thence east along the south line of said section a distance of seven hundred fifty-six and seventy-nine one-hundredths (756.79) feet; thence north and parallel to the east line of said section a distance of seven hundred seventy (770) feet to the true point of beginning; thence continuing north and parallel to the east line of said section a distance of four thousand four hundred fifty (**4,450**) feet to a point on the south right-of-way line of S.E. 15th Street; thence west along the south right-of-way line of S.E. 15th Street a distance of three thousand (3,000) feet; thence south and parallel to the west line of said section a distance of three thousand eight hundred seventy (3,870) feet to a point being the intersection of the easterly right-of-way of Palmer Drive and the center line of the right-of-way of Ercoupe Court; thence southeasterly along the eastern right-of-way of Palmer Drive to a point which is seven hundred seventy (770) feet north of the south line of said section and seven hundred twenty-one and seventy-nine one hundredths (721.79) feet east of the west line of said section; thence east and parallel to the south line of said section a distance of two thousand six hundred seventy-five (2,675) feet to the point of beginning.*"

From the 2006 AICUZ Study for Tinker AFB:

4.6.2 Clear Zones and Accident Potential Zones

"*Figure 4.5 depicts the CZs and APZs for Runways 17/35 and 12/30 at Tinker AFB. Each end of each runway has a 3,000 foot by 3,000 foot CZ, a 3,000 foot by 5,000 foot APZ I, and a 3,000 foot by 7,000 foot APZ II. Accident potential on or adjacent to the runway or within the CZ is so high that the necessary land use restrictions would prohibit reasonable economic use of land. As stated previously,* ***it is Air Force policy to request that Congress authorize and appropriate funds to purchase the real property interests in this area to prevent incompatible land uses.***"

Midwest City considers existing land uses in APZ II for Runway 17/35 and the extended APZ I for Runway 17/35 pre-existing conditions that should be grandfathered as incompatible uses. Midwest City intends to allow these uses to continue.

Midwest City will not permit the following:

- New uses that could cause a release of steam, dust, smoke, or any other substance that could impair visibility or otherwise interfere with the operation of aircraft are prohibited. Normal discharges of steam or smoke associated with heating and cooling or preparation of food are excluded from this prohibition.
- New uses that could cause light emissions, such as spotlights or laser projections, that could interfere with pilot vision are prohibited.
- New uses that could cause electrical emissions, such as transmission towers or broadcasting facilities, that could interfere with aircraft communication systems or navigational equipment are prohibited.
- New uses that could attract wildlife capable of creating a hazard to navigation, such as landfills or food processing facilities, are not permitted. Additionally, stormwater conveyance, detention, and retention facilities (including created wetlands), located within the APZ-II zone for Runway 12/30, Tinker Air Force Base, should be designed so as to minimize the attraction of hazardous wildlife, and when possible should conform to the advisory guidance provided for in Federal Aviation Advisory Circular AC 150/5200-33B: Hazardous Wildlife Attractants on or Near Airports.

Midwest City will require avigation easements in the extended APZ I and APZ II at the time of building permit.

Midwest City believes that change to the incompatible uses in APZ I and APZ II should be permitted provided the new use is of similar intensity based on the 2006 AICUZ Study land use table guidelines. Nonconforming uses may be expanded in accordance with the adopted zoning ordinance.

5.7.3 Tinker Business and Industrial Park

Tinker Business and Industrial Park (TBIP) is an example of how a dynamic military installation and adjacent communities work together to develop employment and service centers. However, as development continues to put pressure on installations, comprehensive studies can result in more stringent recommendations. Such is the case with the 2006 AICUZ Study which identifies the TBIP as an incompatible land use within APZ I. The Midwest City Airport Zoning ordinance, No. 1832 adopted in 1983 and subsequently amended, had established business parks as compatible land uses in APZ I. TBIP was conceived in the mid-1980s, and the zoning for the project was ultimately approved by Midwest City. The existing facilities within TBIP appear to be consistent with the standards established by Midwest City prior to the publication of the 2006 AICUZ Study. Midwest City recommends new development within the current limits of TBIP be permitted provided it is consistent with the approved PUD (PC-1181) for said property.

The available record reflects that there was substantial coordination between TBIP, Tinker Air Force Base and Midwest City in the approval and subsequent development of TBIP as currently constructed. (See Appendix F for additional information regarding the development of TBIP.)

Recommendation:

- New construction within TBIP should be compatible with land uses as discussed in Table 4.3 of this study.

5.8 Oklahoma City Comprehensive Plan Evaluation

A review of the OKC Plan, 2000-2020 revealed that the two AICUZ studies completed for Tinker AFB were not referenced. Additionally, the City had not delineated the CZs or the APZs on its future land use map. In December 2004, the City adopted a policy allowing "sector" plans to be adopted as amendments to the Comprehensive Plan.

The Southeast Sector Plan, an amendment to the OKC Plan, 2000-2020, has proposed four distinct land use designations that may affect future development with respect to the Base. The areas south and southwest of Tinker AFB are shown as Urban Growth and Environmental Conservation. West of the Base is shown as Urban Growth development while the areas to the south/southeast, including Lake Stanley Draper, are reserved for conservation. East of Douglas Boulevard is shown as industrial/nonresidential.

5.8.1 Oklahoma City Southeast Sector Plan Evaluation

The City's Southeast Sector Plan, adopted February 2007, specifically addresses development around Tinker AFB by making the following recommendations:

> *"Allow for the expansion of Tinker and the expansion of specialized industrial development within a strategic area to:*
> *− promote economic development,*
> *− sustain continued success of the AFB, and*
> *− prevent adverse impacts of development."*

These recommendations were derived, in part, from the recommendations of the 2006 AICUZ Study along with established criteria for achieving compatibility with the military installation. The six criteria were as follows:

- Land Use Compatibility
- Regulation of Heights and Obstructions
- Maintenance and Reduction of Densities

- Participation of Tinker AFB in the Development Review Process
- Mitigation of Noise Impacts
- Road Access

The intent of the policies in the Southeast Sector Plan is to:

- Require adjacent development to be compatible with the airport related activities
- Limit new construction and redevelopment within the flight path
- Prohibit new development which inhibits safe and efficient airport operations within the APZs
- Prohibit noise sensitive development such as residences, schools, hospitals, etc. which do not provide the required noise attenuation features
- Ensure all building regulations (floor area ratio and height) are promoted to guarantee the continued efficient airport operation to ensure public safety
- Protect the natural areas around Tinker AFB from encroachment
- Work with Tinker AFB to address traffic, infrastructure and residential development needs as expansion occurs and endorse future recommendations from this Joint Land Use Study

Two highways, I-240 and I-40, provide east-west access through the Southeast Sector as part of the federal interstate highway system. The planning, design and construction of these thoroughfares is managed by the Oklahoma Department of Transportation (ODOT). Coordination among local, state and federal governments will be necessary to provide transportation configurations that will improve traffic flow without increasing development around Tinker AFB. Oklahoma City does not favor the creation of an Interstate bypass in the Southeast Sector, primarily because of the potential development that could occur as a result of increased traffic capacity. In addition to potential encroachment issues, if high-density land uses are permitted along major thoroughfares, traffic counts could increase to levels that would create security risks for Tinker AFB. The Southeast Sector Plan's recommended policies and actions regarding land development (Chapter 3) and infrastructure (Chapter 4) appear to be the planning tool that could be used to:

- Ensure that new development will not obstruct military aircraft operations
- Ensure that a Tinker AFB representative will be included in the review of all rezonings and plan amendments within the APZs
- Promote compatible development within APZs through maintenance of reduced densities
- Ensure that the City will continue to review impacts of development, their visibility characteristics, and penetration of airspace within approach zones
- Prohibit construction of communication towers and antennas in APZ's
- Protect all access roads to and from the Base, from private interest road closures

This zoning code should be modified to include the identification of all APZs and CZs as identified in the 2006 AICUZ Study and detailed descriptions of land uses and associated densities permitted in each of these zones.

The Southeast Sector Plan recommends that a transportation study be conducted related to the possible closure of a portion of Douglas Boulevard adjacent to the Maintenance Repair and Overhaul Technology Center (MROTC). As the MROTC becomes fully developed, there may be a need for the permanent closure of part of Douglas to replace the current practice of taxiing aircraft between the base and the MROTC during low traffic periods. Oklahoma City, in partnership with the Oklahoma Department of Transportation, is expected to address capacity issues of I-40 at Air Depot Boulevard eastward as well as those related to other nearby section line roads. Improvements in ramps, overpasses and interchanges along I-40 and I-240 will also be considered.

5.8.2 Oklahoma City Zoning Code Evaluation

Chapter 59, Article XIII of the existing Zoning Ordinance for Oklahoma City addresses the JLUS study area the same as any other area in the city. The delineation of the APZs on the Future Land Use Plan map and incorporation of policies into the Comprehensive Land Use Plan Have been implemented by the existing zoning code. The 2007 Airport Environs (AE) Zones have been adopted as follows:

"A. Airport Environs Zone One (AE-1) The Airport Environs Zone One (AE-1) shall be governed by the following regulations:

(1) Certain land uses, such as agricultural, airport property and related uses, industrial uses, wholesale and retail commercial uses, and areas zoned for open space or recreational uses, are deemed compatible, and therefore shall be exempted from the provisions of Division 4 of Article II of Chapter 12 of the Oklahoma City Municipal Code.

(2) Other uses allowed within the AE-1 Zone shall meet or exceed building code requirements for a minimum noise level reduction of thirty (30) decibels inside the structure as set forth in Division 4 of Article II of Chapter 12 of the Oklahoma City Municipal Code.

(3) All uses allowed within this zone shall grant an avigation easement right as a condition of subdivision or building permit approval, except as otherwise provided herein. Said avigation easement right shall be granted to the Oklahoma City Airport Trust for uses within the AE-1 Zones for Will Rogers World Airport, Wiley Post Airport and Clarence E. Page Airport.

(4) Single-family or two-family residential uses, institutional uses such as schools, community centers, churches, etc., are prohibited in this zone.

B. Airport Environs Zone Two (AE-2) Airport Environs Zone Two (AE-2) shall be governed by the following regulations:

(1) Certain land uses, such as agricultural, airport property and related uses, industrial uses, wholesale and retail commercial uses, and areas zoned for open space and recreational uses, are deemed compatible, and therefore shall be exempted from the provisions of Division 4 of Article II of Chapter 12 of the Oklahoma City Municipal Code.

(2) Other uses allowed within this zone shall meet or exceed building requirements for a minimum noise level reduction of twenty-five (25) decibels, inside the structure as set forth in Division 4 of Article II of Chapter 12 of the Oklahoma City Municipal Code.

(3) All uses allowed within this zone shall grant an avigation easement right to the Oklahoma City Airport Trust as a condition of subdivision or building permit approval, except as otherwise provided. Said avigation easement right shall be granted to the Oklahoma City Airport Trust for uses within the AE-2 Zones for Will Rogers World Airport, Wiley Post Airport and Clarence E. Page Airport.

C. Avigation easements submitted pursuant to the terms of this section shall conform to the provisions contained within the Oklahoma City Airports Model Avigation Easement, a copy of which shall remain on file in the Office of the City Clerk."

The AE (1) and AE (2) sections apply to all lands surrounding all airports, including Tinker AFB. None of the airports within the city limits have a specific Comprehensive Land Use Plan category.

Section 59-13150. Airport Zoning Overlay Districts pertains to all airports, including Tinker AFB. According to the code, the intent of this section is:

(1) To prevent the occurrence of airport hazards.

(2) To protect the long-term utility of airports and the public investment involved therein.

(3) To restore or enhance the public health, safety and welfare of residents living around airports.

Subsection 13150.7 includes specific regulations for Tinker AFB proper. These regulations, based on Tinker's zoning map data from 1960, deal primarily with height restrictions. There are no references to the APZs or CZs, associated densities, or uses permitted or prohibited. Furthermore, subsection 13150.10 pertaining to building permits states that variances from Airport Zoning Overlay Districts requirements are permitted through the Board of Adjustment, provided copies of all notices required by the Federal Aviation Administration under Federal Aviation Regulation Part 77, and copies of all Federal Aviation Administration action taken pursuant to the case are included in the variance request.

5.8.3 Oklahoma City Area Regional Transportation Study

The Association of Central Oklahoma Governments (ACOG) has developed the 2030 Oklahoma City Area Regional Transportation Study (OCARTS) Plan. This plan calls for the improvement of nearly 540 miles of streets and highways in the regional network to accommodate increased demand, which is anticipated to grow 53 percent between 2000 and 2030.

Significant projects include the following:

- Widening of US-77, from Etowah Road (S. 329th) to Purcell east city limits
- Widening of Covell Road (N. 206th), from Pennsylvania Avenue to Western Avenue
- Widening of I-35, from I-44 to N. 23rd Street
- Widening of I-240, from I-35 to I-40

- Widening of I-44, from I-240 to SH-37
- Construction/relocation of new 10-lane I-40 Crosstown, from Agnew Avenue to I-235
- Reconstruction of interchanges at I-44/I-235 (Broadway Extension) and at I-40/I-35 (Crossroads)
- Widening of Sara Road, from S. 15th Street to S. 74th Street
- Widening of SH-9, from 24th Avenue W. (Eastern Ave.) to Pottawatomie Road
- Widening of I-35, from Waterloo Road (N. 248th) to SH-66
- Widening of I-40, from Choctaw Road to Pottawatomie Road
- Widening of I-35, from SH-9 West Interchange to SH-74/Goldsby Exit
- Widening of SH-74, from Memorial Road (N. 136th) to Waterloo Road (N. 248th)
- Widening of Sooner Road /SH-77H, from I-35 to Classen Avenue /US-77

Projects in the vicinity of Tinker AFB include the widening of I-40 to six lanes east of Tinker AFB, turning Sooner Avenue into a six-lane arterial roadway, and widening I-240 to six lanes. The 2030 OCARTS Plan recommends doubling the miles of bicycle trails/routes throughout the region from nearly 200 miles to over 400 miles by 2030. The OCARTS Plan also adopted the bus and rail transit strategies in the Central Oklahoma Transportation and Parking Authority's (COTPA) long-range plan in terms of developing a system of regional transfer points to increase the frequency and convenience of public transit for the general public, and supporting further study of regional fixed guideway transit.

In recent years, Midwest City added a center turning lane along Douglas Boulevard and Air Depot Boulevard between SE 15th Street and SE 29th Street. Midwest City and the Oklahoma Department of Transportation also reconfigured the interchange at I-40 and F Avenue in 2005 to provide more efficient traffic flow into the new retail district being developed along SE 29th Street. Computer modeling has demonstrated that the queuing of vehicles entering Tinker AFB should not be affected.

Figure 5.4 2030 OCARTS Plan
Street and Highway Network

LEGEND

LIMITED ACCESS FACILITIES

Completed Projects As of 12-31-2005		Planned or Under Construction
	4 Lanes	
	5 Lanes	
	6 Lanes	
	8 Lanes	
	10 Lanes	

ARTERIALS

Completed Projects As of 12-31-2005		Planned or Under Construction
	2 Lanes	
	3 Lanes	
	4 Lanes	
	5 Lanes	
	6 Lanes	

OUTER LOOP STUDY CORRIDOR

The Outer Loop Study final report was completed subsequent to the adoption of the 2030 OCARTS Plan. An environmental impact statement, in conformance with federal guidelines, will be necessary to establish a final alignment within the corridor reflected on this map.

BASE MAP ELEMENTS

- Rail Lines
- OCARTS Boundary
- County Boundary
- Airports
- Amtrak Stations

DISCLAIMER:

This map/data was created and assembled by ACOG for your informational, planning reference and guidance only. None of these materials should be utilized by you or other parties without the benefit of advice and instruction from appropriate professional services. These materials are not verified by a Registered Professional Land Surveyor for the State of Oklahoma and are not intended to be used as such. ACOG makes no warranty, express or implied, related to the accuracy or content of these materials and map/data.

Source: Association of Central Oklahoma Governments

Figure 5.4 2030 OCARTS PLAN (cont.)

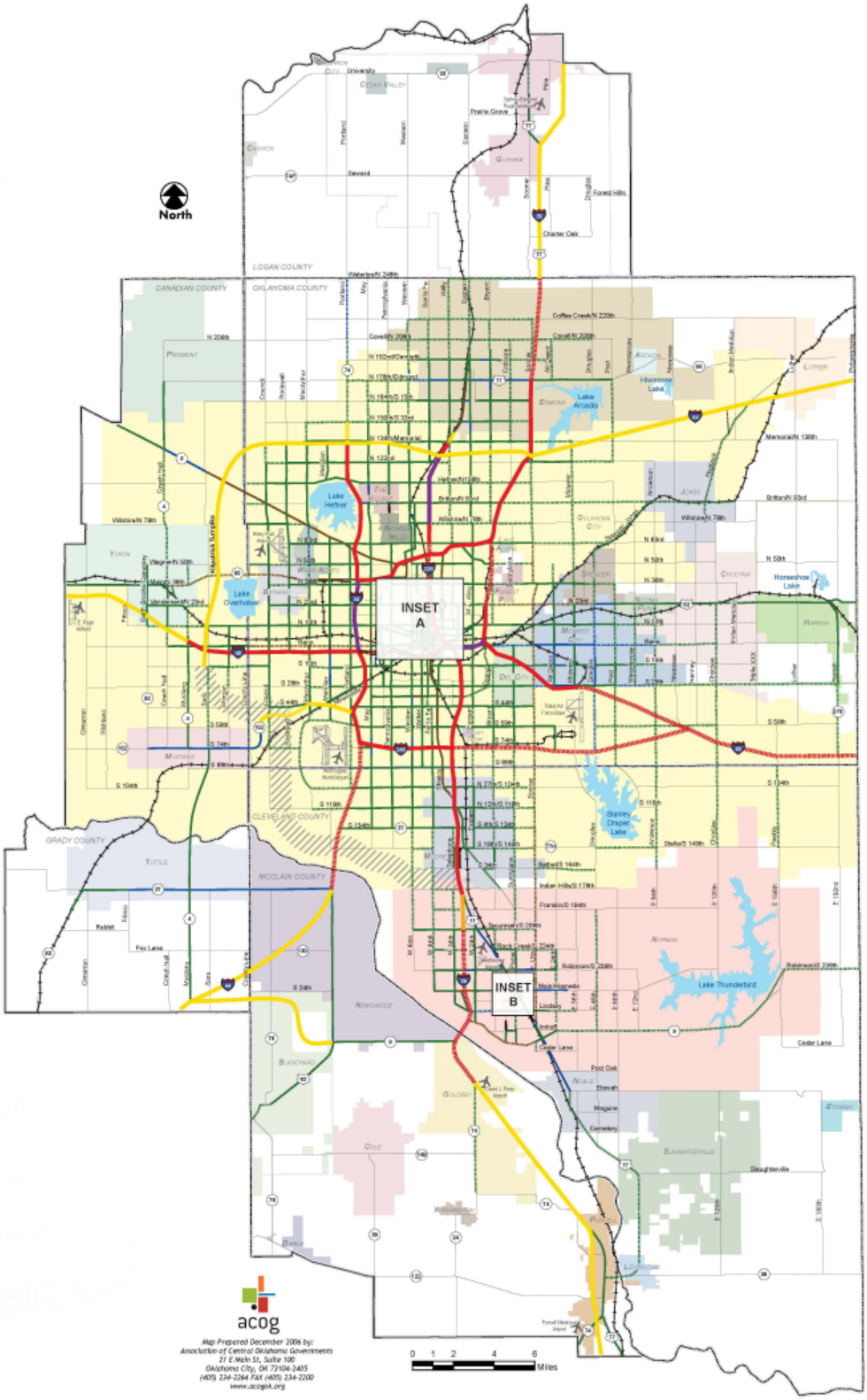
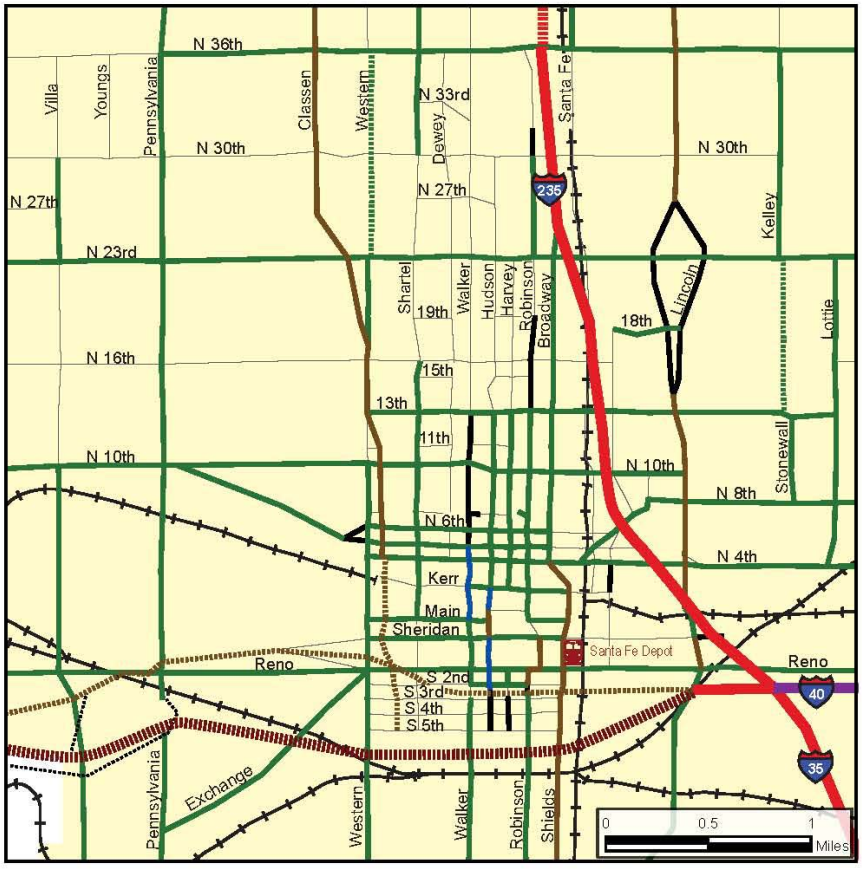
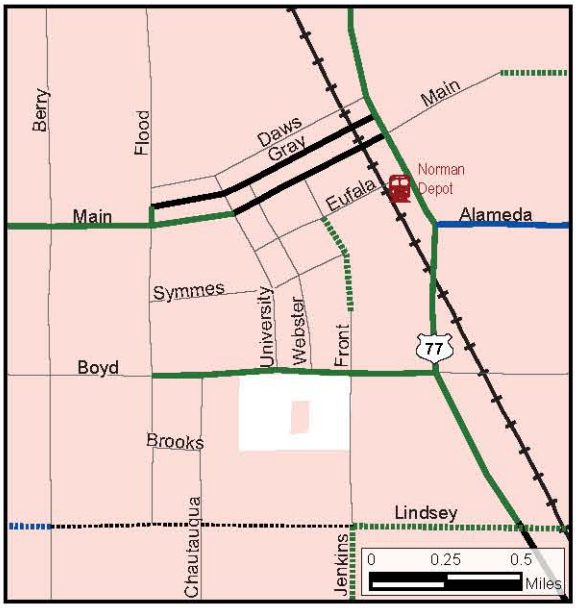


Figure 5.4 2030 OCARTS PLAN (cont.)

INSET A - OKLAHOMA CITY BUSINESS DISTRICT



INSET B - NORMAN BUSINESS DISTRICT



5.9 2007 Oklahoma County Master Plan

Adopted in September 2007, Oklahoma County's Master Plan provides the framework for development through the year 2030. This is the first Comprehensive Plan to be adopted since 1947.

Tinker AFB lies entirely within the boundaries of Oklahoma County. The County owns land that it purchased through a bond issue to protect Tinker AFB. These properties are located within Midwest City and Oklahoma City. The County has no jurisdiction concerning land use decisions on these properties. There is no unincorporated county land that is privately owned within the AICUZ noise contours or APZs.

5.9.1 Oklahoma County Zoning Regulations Evaluation

Existing regulations do not address the 2006 AICUZ Study for Tinker AFB since there is no privately owned unincorporated land within the noise contours or APZs, and the County-owned land is under the jurisdiction of Midwest City, Del City or Oklahoma City. The County has no jurisdiction over land use decisions within the JLUS study area.

5.10 City of Spencer Zoning Regulations Evaluation

Zoning ordinances establish land development standards, that when used appropriately, can contribute to the mitigation of land use compatibility conflicts. Current zoning regulations for the City of Spencer do not prevent development of current and future incompatible uses within the 2006 AICUZ noise contours. Although a relatively small portion of the City of Spencer is affected by the 65 decibel day-night average A-weighted sound level (dB DNL) noise contour, this land use concern could become more critical if activity at Tinker AFB changes/increases.

5.11 Local Government Land Use Strategies

A JLUS is a cooperative land use planning effort between affected local governments and a military installation. The recommendations from a JLUS provide a policy framework to support adoption and implementation of compatible development measures (first identified in the AICUZ Study) designed to prevent urban encroachment, safeguard the military mission, and protect the public health, safety and welfare. Local governments have the authority to implement AICUZ/ JLUS guidelines.

5.11.1 Conservation

Conservation refers to a series of tools designed to eliminate land use incompatibilities through voluntary transactions in the real estate market and local development process. These strategies are particularly effective because they advance the complementary goals of shifting future growth away from the installation, while protecting the environment, maintaining agriculture/silviculture, and conserving open spaces and rural character.

As part of this strategy, local governments in the region would explore partnerships with the U.S. Department of Defense (DoD), the State of Oklahoma, and non-profit conservation entities, such as the Trust for Public Land, The Nature Conservancy, and Land Legacy to secure conservation easements or to purchase development rights from willing sellers of land in proximity to Tinker AFB.

Such an initiative seeks to protect lands primarily through a conservation easement in which a landowner exchanges some of the development potential of a tract for tax incentives. Other tools for conservation could include transfer of development rights and purchase of development rights, which compensates the owner for the assessed market value of development potential lost when the land remains permanently undeveloped.

5.11.2 General Land Use Guidelines

Land use compatibility guidelines encourage or require activities (industry, retail, recreation, agriculture, very low density/rural residential) that maintain compatibility with base operations. Compatible activities generally avoid the concentration of people and have lower sensitivity to noise/vibration, smoke and other possible operational impacts. Local governments implement such guidelines through Comprehensive Plans, zoning ordinances and other legislative tools.

5.11.3 Attenuation

Attenuation refers to special design and construction practices intended to lower the amount of noise and vibration that penetrates through the windows, doors, and walls of a building to the interior. Local governments typically require sound attenuation as part of building code enforcement for new residential and other noise sensitive construction in certain noise affected areas.

Sound attenuation
Energy improvements also reduce sound. (U.S. Department of Energy)

Sound attenuation measures required for structures are addressed by the International Building Code (IBC), issue dates 2000, 2003, and 2006. Section 1206.2 of the 2000 IBC; and Section 1207.2 of the 2003 and 2006 IBC require sound transmission classifications of 50 decibels or less from airborne sound for interior environments. Local corrective action may consist of simply upgrading existing local building codes to the latest version of the IBC. **In most cases, compliance with energy code requirements will bring the interior noise levels to an acceptable level, whether for new construction or remodeling.**

5.11.4 Disclosure

Disclosure requires the release of information on possible impacts (dust, smoke, noise/vibration, vehicular movements, and air safety zones) to prospective buyers or renters during real estate transactions for properties close to Tinker AFB. Local governments could implement this requirement by adopting a local real estate disclosure ordinance. Disclosure will be discussed in more detail in Section VI of this study.

5.11.5 Infrastructure

As part of implementation of this study, **local governments should consider the impacts of both public and private infrastructure installation/extension (e.g. water and sewer facilities) into noise and safety affected areas around Tinker AFB.** New infrastructure can induce or support incompatible growth patterns, such as high-density residential development, especially if compatible zoning and land use guidelines are not in place.

5.11.6 Coordination

Under this approach, local governments promote collaboration by sharing information on specific community development proposals (rezonings and subdivisions). **The Military also should share information about on-base activity that may increase off-base noise levels or expand noise zones or aircraft operations farther off the installation.**

5.11.7 AICUZ Land Use Guidelines

AICUZ Land Use Guidelines focus specifically on land uses near airfields. They encourage or require land uses that maintain compatibility with safe air space operations, including limiting concentrations of people, as well as properly siting and marking tall structures to protect airspace zones, and meeting the approval of the DoD.

Planners, code enforcement officers and building inspectors should educate local developers and residents on code compliance regulations, methods, and technologies as needed. In regards to land use compatibility with military installations, codes addressing the following areas are especially relevant:

- Excessive garbage or other activities that would attract birds or other animals potentially hazardous to military operations
- Presence of incompatible land uses as per zoning ordinances
- Excessive vegetation or construction of structures exceeding acceptable height or density standards
- Light producing sources above acceptable limits for night navigation or military operations

5.11.8 Clustering and Transfer of Development Rights

Clustering can be an effective tool in promoting land use compatibility around a military installation, particularly on larger parcels that straddle a noise or safety boundary. Developers can separate the buildable areas of the parcel from locations that have a development constraint, such as noise or safety exposure. The district then allows more compact lots in the developable portion of the site in exchange for the permanent protection of land in the constrained area. Cluster development can:

- Result in the permanent preservation of open space that would not normally be preserved under traditional development
- Encourage creative site planning that is sensitive to the natural characteristics of the land without sacrificing existing, permitted densities
- Provide for economical development and efficient provision of public services
- Minimize road and driveway construction and paving
- Promote aesthetics and other amenities

Cluster development is also referred to as open space zoning, conservation zoning, conservation subdivision, or a type of density transfer. Cluster development may be implemented through the use of a Planned Unit Development (PUD).

Local governments could also pursue a pure transfer of development rights (TDR) program, which shifts growth from a designated "sending area" with development constraints (noise or air safety zones, areas adjacent to the Base, conservation buffers) to a designated "receiving area" that does not have site limitations. This transaction takes place voluntarily in the free market. The owner of the constrained land sells the development credits established under zoning to a buyer who then can develop additional density on another property based on the number of credits purchased.

Also as part of this strategy, local governments could require developers to use low impact site design principles, including the creation of green space/conservation buffers that can support noise and safety impact mitigation.

SECTION VI
Noise Definitions and Attenuation

Flag it
Staff Sgt. Trevor Wilson prepares an E-3 Sentry Airborne Warning and Control System aircraft for flight during Joint Red Flag 2005. (U.S. Air Force photo by Tech. Sgt. Patrick M. Kuminecz)

6.1 Acronyms and Abbreviations

ACOG	Association of Central Oklahoma Governments
AFB	Air Force Base
AFI	Air Force Instruction
AGL	above ground level
AICUZ	Air Installation Compatible Use Zone
APZ	Accident Potential Zone
CZ	Clear Zone
dB	decibel
DNL	Day-Night Average A-Weighted Sound Level
DoD	Department of Defense
EPA	U.S. Environmental Protection Agency
FAA	Federal Aviation Administration
FAR	Federal Aviation Regulations
Hz	Hertz
IBC	International Building Code
INM	Integrated Noise Model
NLR	Noise Level Reduction
RPZ	Runway Protection Zone
SEL	Sound Exposure Level
SENEL	Single-Event Noise Exposure Level
STC	Sound Transmission Class
the Base	Tinker Air Force Base

6.2 Noise Levels and Events

Noise at excessive levels can affect our environment and our quality of life. Noise is subjective since it is dependent on the listener's reaction, the time of day, distance between source and receptor, and its tonal characteristics. At excessive levels, people typically perceive noise as being intrusive, annoying, and undesirable. Aircraft noise may have an adverse impact on a geographical area surrounding active flying operations. Because of the impact of noise on residential areas and related land uses, and the potential for noise complaints that might interfere with flight operations, both the Federal Aviation Administration (FAA) and the U.S. Department of Defense (DoD) require the mapping of the noise contours associated with each runway's specific aircraft operations. These contours define the threshold between different levels of noise exposure, and may be used to guide the types of real estate development that are allowed or restricted in the noise impacted area.

New applications
Teams from the 327th Aircraft Sustainment Wing scrub down B-1Bs with a new pretreatment product proven to create a much tighter bond between existing surfaces and new coatings. (Air Force photo)

In general, the impact of noise is greater nearer the runway end and along its extended centerline. However, the restrictions associated with noise zones are generally less strict than those stemming from the Clear Zones (CZ) and Accident Potential Zones (APZ). At the noise levels that typically occur off-base, Air Force and FAA regulations generally recommend noise abatement (the implementation of specific practices aimed at increasing the sound insulation of building envelopes) and disclosure (the inclusion of certain clauses in the legal paperwork, informational in nature, accompanying the sale of homes). It specifies that the structure is in a noise zone and that a purchaser should be aware of the potential impacts.

Measurement and perception of sound involves two basic physical characteristics: amplitude and frequency. Amplitude is a measure of the strength of the sound and is directly measured in terms of the pressure of a sound wave. Because sound pressure varies in time, various types of pressure averages are commonly used. Frequency, generally perceived as pitch, is the number of times per second the sound causes air molecules to oscillate. Frequency is measured in units of cycles per second, or Hertz (Hz).

Noise is usually measured in decibels (dB), because of the great dynamic range of the human ear. Decibels (dB) are based on a logarithmic scale that compresses the wide range in sound pressure levels to a more usable range of numbers. People judge a sound that is 10 dB higher than another sound as being twice as loud; and 20 dB higher four times as loud; and so forth. Sound on the decibel scale is referred to as a sound level. The threshold of human hearing is approximately 0 dB, and the threshold of discomfort or pain is around 120 dB.

Urban areas typically have a higher ambient noise level, which is the composite of noise from all normal background noise sources at a given location. Single event noises such as an aircraft flyover can affect the background noise level. Single-Event Noise Exposure Level (SENEL) or Sound Exposure Level (SEL) is a rating scale used to measure single event noises. The SENEL measures the duration between the initial and final times for which the sound level of the single event exceeded the background noise level. It takes into account the maximum noise level and the duration of the event. Military air installations present different noise issues compared to civilian airports.

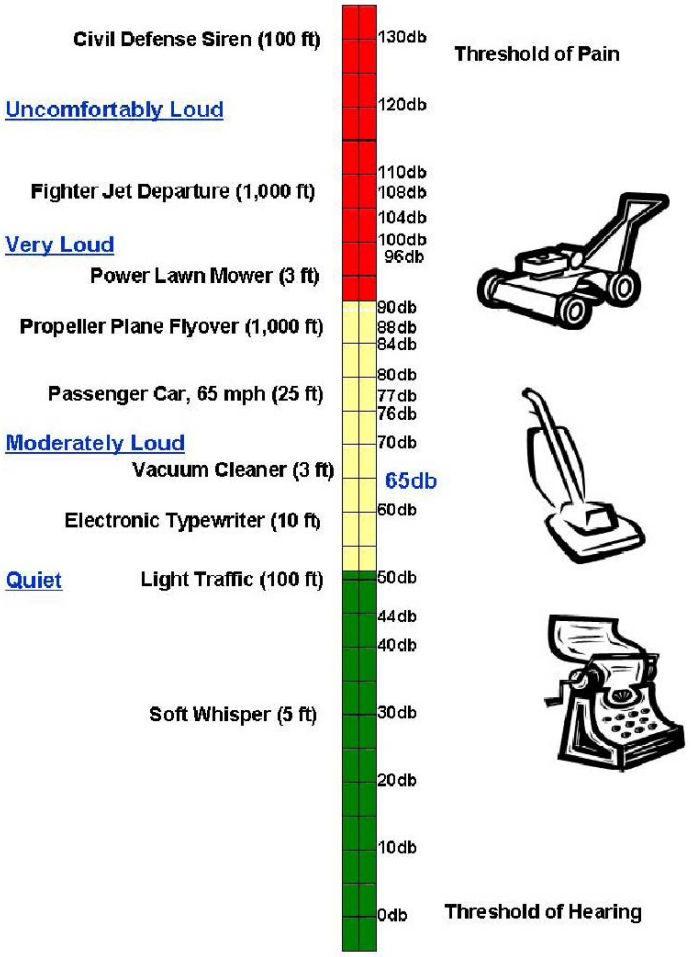
Military readiness requires constant training. Aircraft training includes touch and goes (takeoffs and landings with a close-in circuit around the airport), aircraft carrier simulated landings, practice instrument approaches, and normal departures to and arrivals from other installations or training areas. As a result, noise can affect more areas here than what generally occurs at civilian airports. Training activities are in addition to the normal flight operations for the facility.

Noise impacts can typically be abated by four basic methods: (1) reducing the sound level of the noise generator; (2) interrupting the noise path between the source and receiver; (3) increasing the distance between the source and receiver, and (4) insulating the receiver (building material and construction methods). All methods help to reduce interior noise levels, but only the first three help to reduce outside noise levels.

Common Noise Sources

Figure 6.1 illustrates the noise level created by common noise sources. This comparison illustrates that a power lawn mower creates approximately 95 dB (when heard from three feet away), while a passenger car creates approximately 77 dB (from a distance of 25 feet). Additionally, a fighter jet departure at 1,000 feet is significantly louder (108 dB) than a propeller plane flyover at the same distance (88 dB).

Figure 6.1 Common Noise Sources



Source: www.pbia.org

Additionally, aircraft noise is compiled into daily averages for the purposes of this study, which allows us to review the average daily effect that noise is having at various distances from aircraft operational areas.

Aircraft produce two types of sound. One is “subsonic” noise, which is continuous sound generated by the aircraft’s engines and also by air flowing over the aircraft itself. The other is “sonic” booms, which are transient impulsive sounds created during supersonic flight. This section discusses only subsonic noise.

6.2.1 Day-Night Average Sound Level

Aircraft noise is measured through the conventional Day-Night Average Sound Level (DNL). This DNL is based on sound levels measured in relative intensity of sound, or decibels (dB) on a weighted or average scale. This scale most closely approximates the response characteristics of the human ear to sound. The higher the number is on the scale, the louder the sound. DNL represents noise exposure events averaged over a 24-hour period. To account for human sensitivity to noise between the hours of 10 p.m. and 7 a.m., noise events occurring during this time receive a “penalty” when the DNL is calculated. A single nighttime event is measured as if ten daytime events occurred.

The DNL scale is used by the FAA to quantify aircraft noise exposure in the vicinity of an airport and used by the DoD in the vicinity of military airfields. Noise contours of specific DNL levels are developed using the FAA’s Integrated Noise Model (INM). Data used in the INM model to develop the contour will result in the depiction of noise exposure in the vicinity of aviation operations. Data used in the INM include: Average Daily Operations, Aircraft Fleet Mix, Runway Use, Flight Corridors and Usage, Departure Destinations and Day/Night Use.

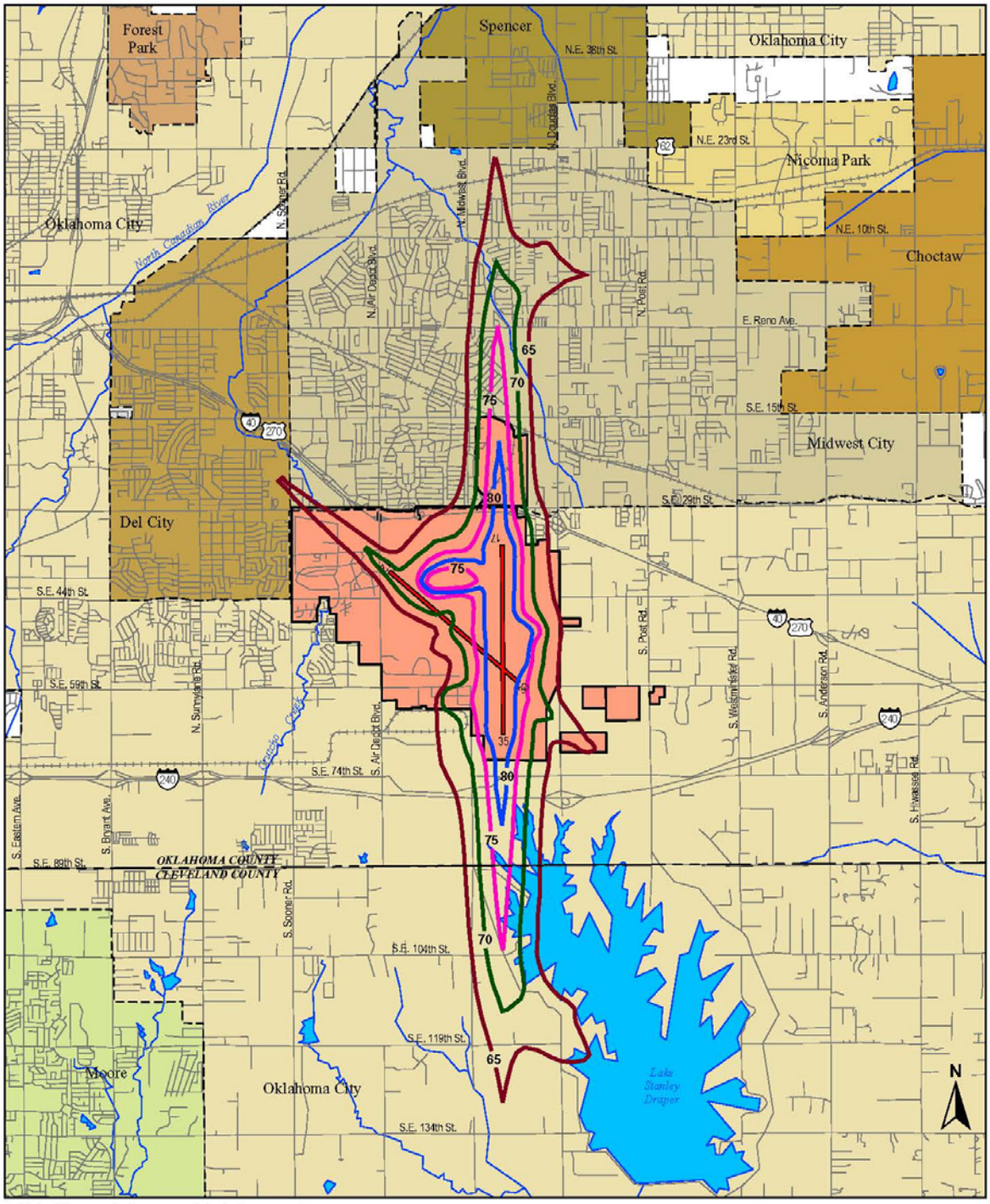
There are several points of interest in the noise-annoyance relation. The first is DNL of 65 dB. This is a level most commonly used for noise planning purposes, and represents a compromise between community impact and the need for activities like aviation which do cause noise. Areas exposed to DNL above 65 dB are generally considered less suitable for residential use. The second is DNL of 55 dB, which was identified by the EPA in 1972 as a level below which there is effectively no adverse impact. The third is DNL of 75 dB. This is the lowest level at which adverse health effects could be credible. Very high annoyance levels make such areas unsuitable for residential land use. In other words, residential land uses normally are not compatible with DNL values above 65 dB, and the extent of land areas and populations exposed to DNL of 65 dB and higher provides the best means for assessing the noise impacts of alternative aircraft actions.

6.3 Land Use Analysis of Noise Contours

The Air Force provides the AICUZ Study to local communities to assist them in preparing their local land use plans. Local land use regulations are not necessarily modified each time the AICUZ is modified. For example, the 1983 AICUZ noise contours were the basis for Midwest City and Del City's overlay zoning district areas, which are still in effect. Oklahoma City's airport environs zones were based on even older data from Tinker AFB. They remain in effect today with no mention of an updated AICUZ.

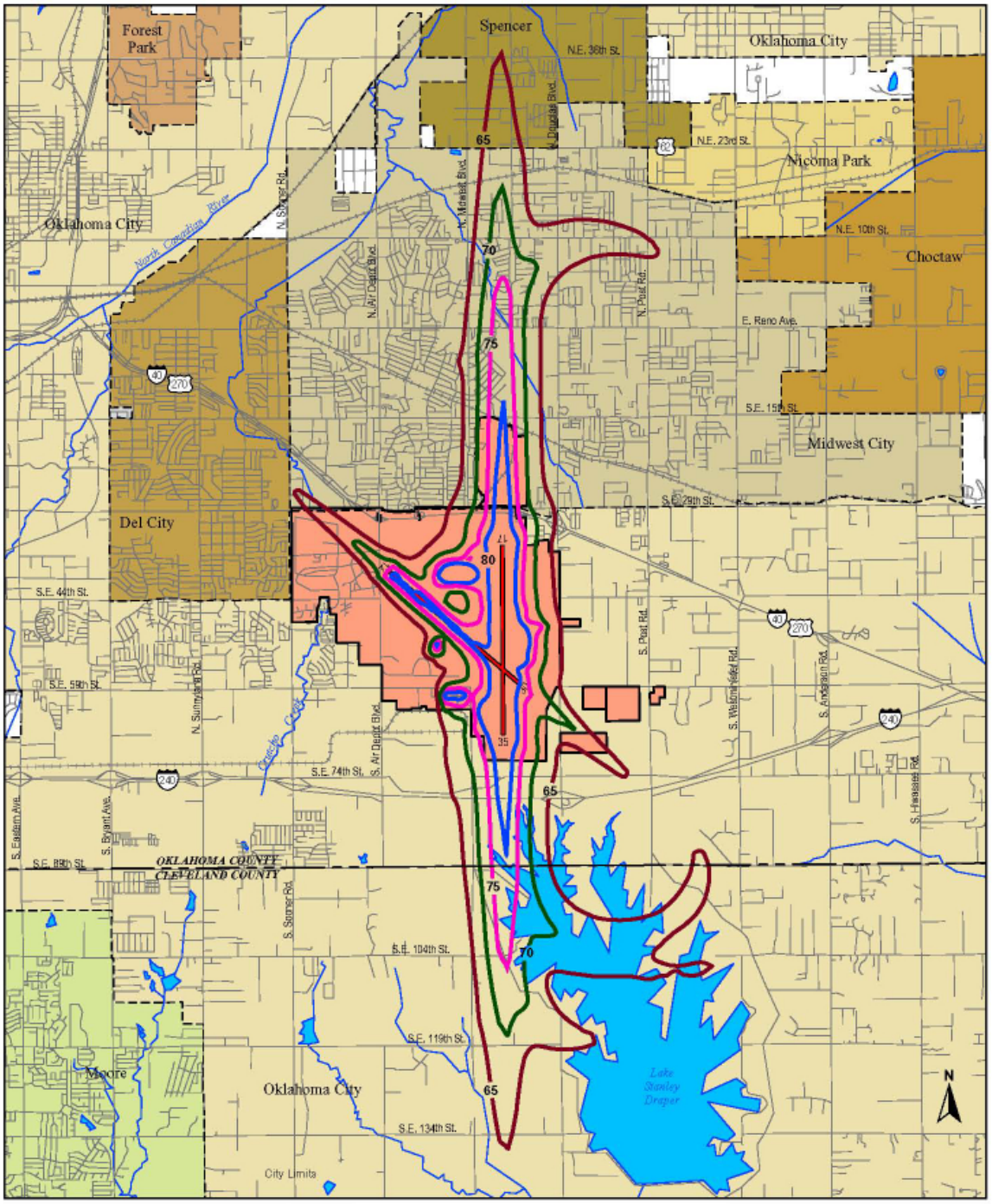
The 2006 AICUZ Study has approximately 2,000 more acres included within noise contours of 65dB or higher than did the AICUZ Study prepared in 1998, as shown in Figures 6.2.a and 6.2.b.

Figure 6.2.a 1998 AICUZ Noise Contours



Source: Tinker Air Force Base 2006 AICUZ

Figure 6.2.b 2006 AICUZ Noise Contours



Source: Tinker Air Force Base 2006 AICUZ

As indicated in the preceding figures, the land area affected by the noise contours has not only increased, but also shifted. For example, the 1998 65 dB DNL contour line shown in Figure 6.2.a extended into Del City but in Figure 6.2.b, it shifts upward into Midwest City, leaving no noise contours in Del City. The noise contours missed the City of Spencer in 1998, but that changed with the 2006 AICUZ Study, as the 65 dB DNL contour line shifted further north. This shift between 1998 and 2006 was caused from:

- An increase in the number of transient aircraft operations at Tinker AFB
- Addition, elimination, and modification of aircraft flight tracks to correspond to flying operations changes
- Technical improvements to the NOISEMAP computer modeling program

Local communities should modify their land use maps as updates to noise contours become available. However, communities may choose to be more restrictive than the AICUZ noise contours in terms of coverage and noise abatement requirements.

6.3.1 Incompatible Land Uses by Community

Table 4.3 in Section IV of this report lists land uses considered by the DoD to be incompatible within the various noise zones. Although the 2006 AICUZ Study identified incompatible land uses within each noise zone for each of the local communities, this report draws on 2005 land use data obtained from the Association of Central Oklahoma Governments (ACOG) in order to conduct an independent review with area specific maps. Del City, Nicoma Park and Choctaw are not included in the analysis, due to the fact the 65 dB DNL as defined by the 2006 AICUZ Study does not extend over their jurisdictions. A map showing the incompatible uses identified in the 2006 AICUZ Study for Tinker AFB is provided as Figure 4.3 on page IV-17.

6.3.1.a Midwest City

Areas affected by the 65+ dB DNL noise contours contain incompatible land uses as defined by the DoD. In Midwest City, several duplexes and mobile homes have been identified between the 65 dB DNL and the 75 dB DNL, along with an assisted living facility, two schools, a lodge and a bank. Most of the incompatible uses lie between Midwest and Douglas Boulevards along Reno Avenue and SE 15th Street. The contour lines for this area are shown on Figures 6.3.a and 6.3.b.

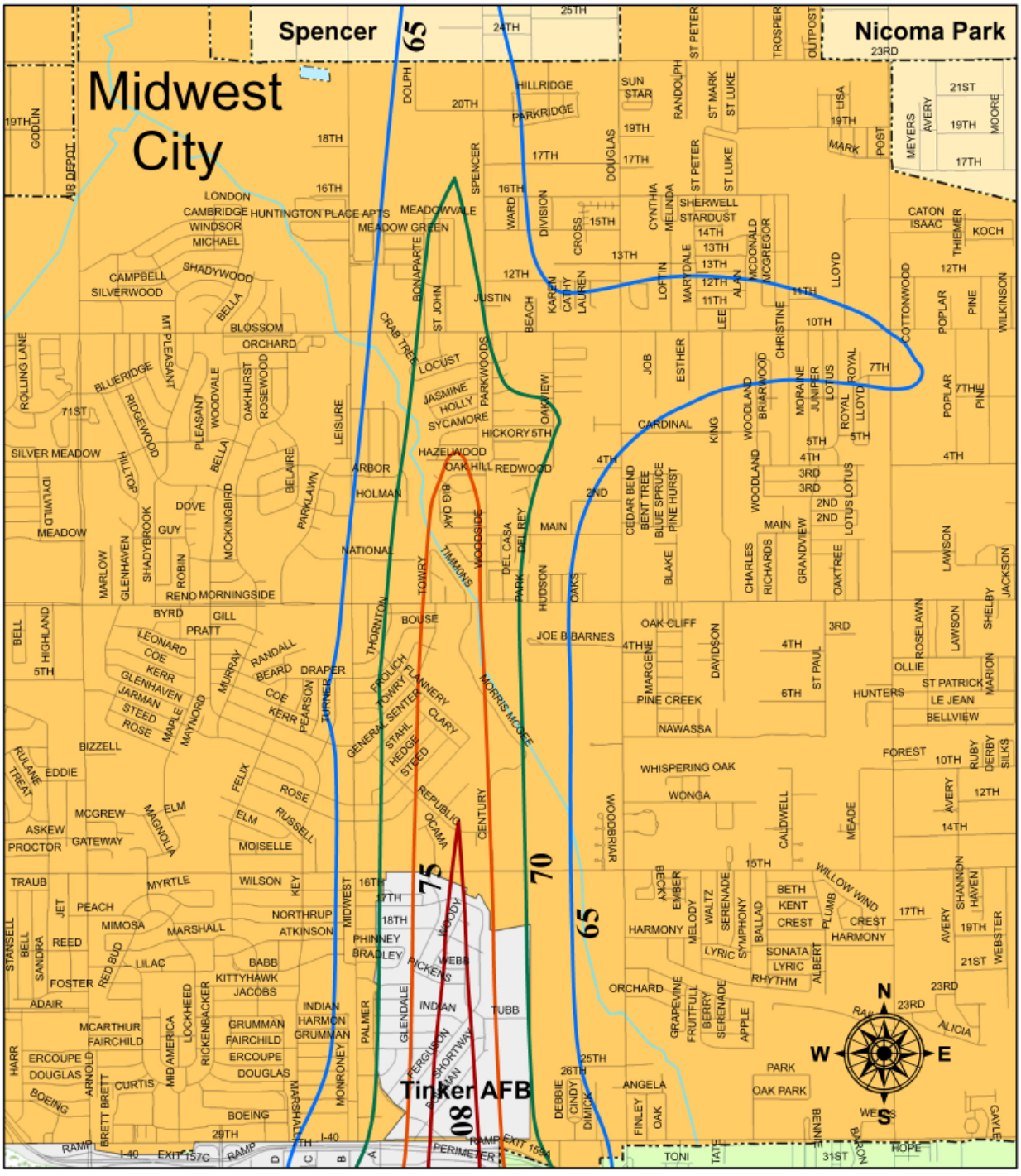
6.3.1.b Oklahoma City

Very few incompatible land uses were found within any of the noise contours covering Oklahoma City. In fact, most of the land adjacent to Tinker lies within Oklahoma City. I-240 runs east and west in close proximity to Runway 35's CZ. A railroad yard, the former General Motors Assembly Plant (approximately 400 acres), and other industrial uses are located between the Base and I-240, with mingled areas of green space. Residential subdivisions are proposed, with some under construction, to the southwest of the property formerly known as the General Motors Plant. Lake Stanley Draper lies south of I-240 and is surrounded by large tracts of undeveloped land. To the east of the Base, minimal commercial development exists along Douglas Boulevard, with new residential developments further east. Figures 6.4.a through 6.4.c depict these areas in more detail.

6.3.1.c City of Spencer

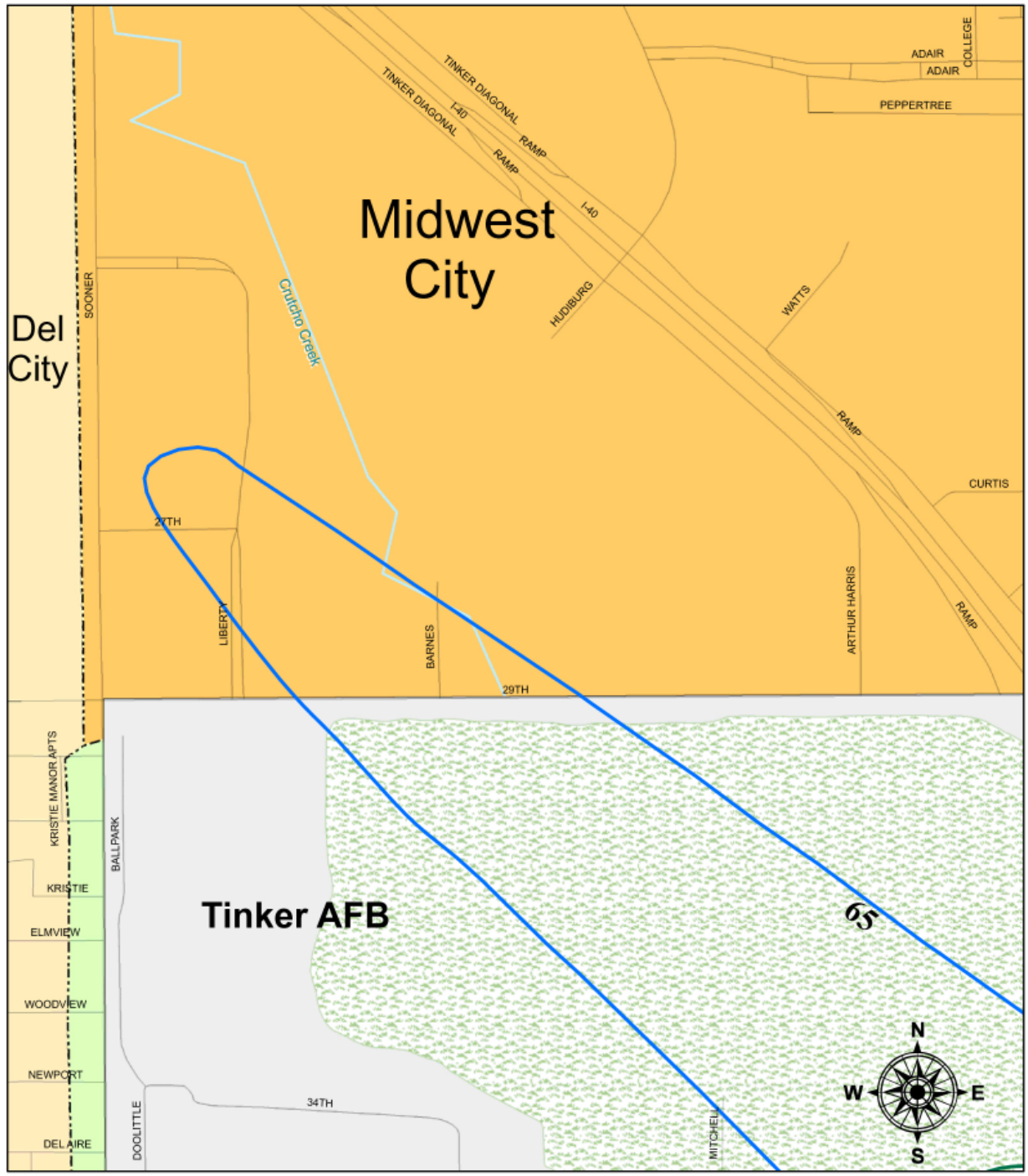
In the City of Spencer, areas affected by the 65+ dB DNL noise contours, shown in Figure 6.5, contain a high school, a hospital and single-family residential. The DoD considers these land uses as generally compatible with noise level reduction.

Figure 6.3.a Properties in Midwest City Located in the 65+ dB DNL



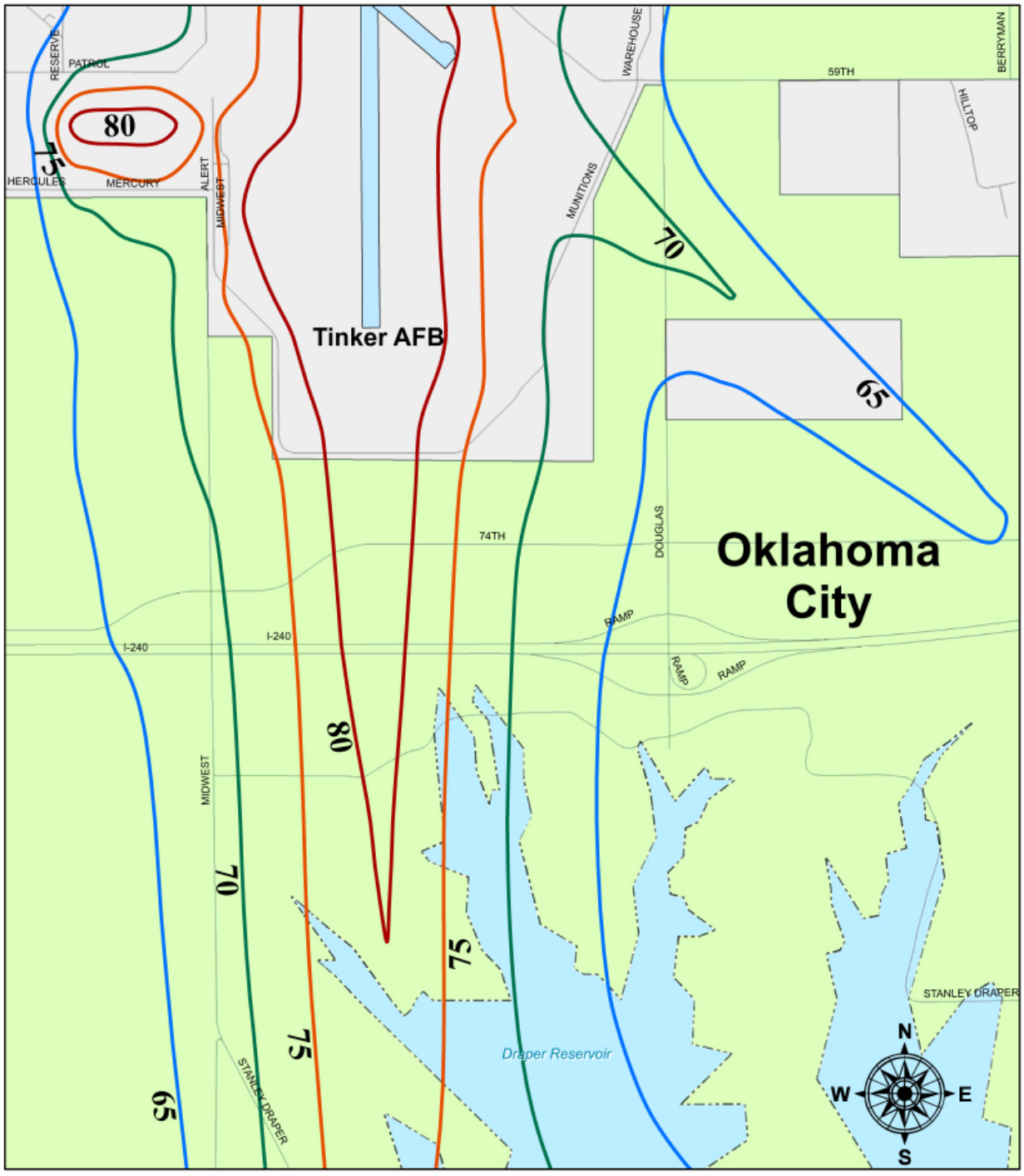
Source: Created from Data Received from ACOG and Tinker AFB

Figure 6.3.b Properties in Midwest City Located in the 65+ dB DNL



Source: Created from Data Received from ACOG and Tinker AFB

Figure 6.4.a Properties in Oklahoma City Located in the 65+ dB DNL

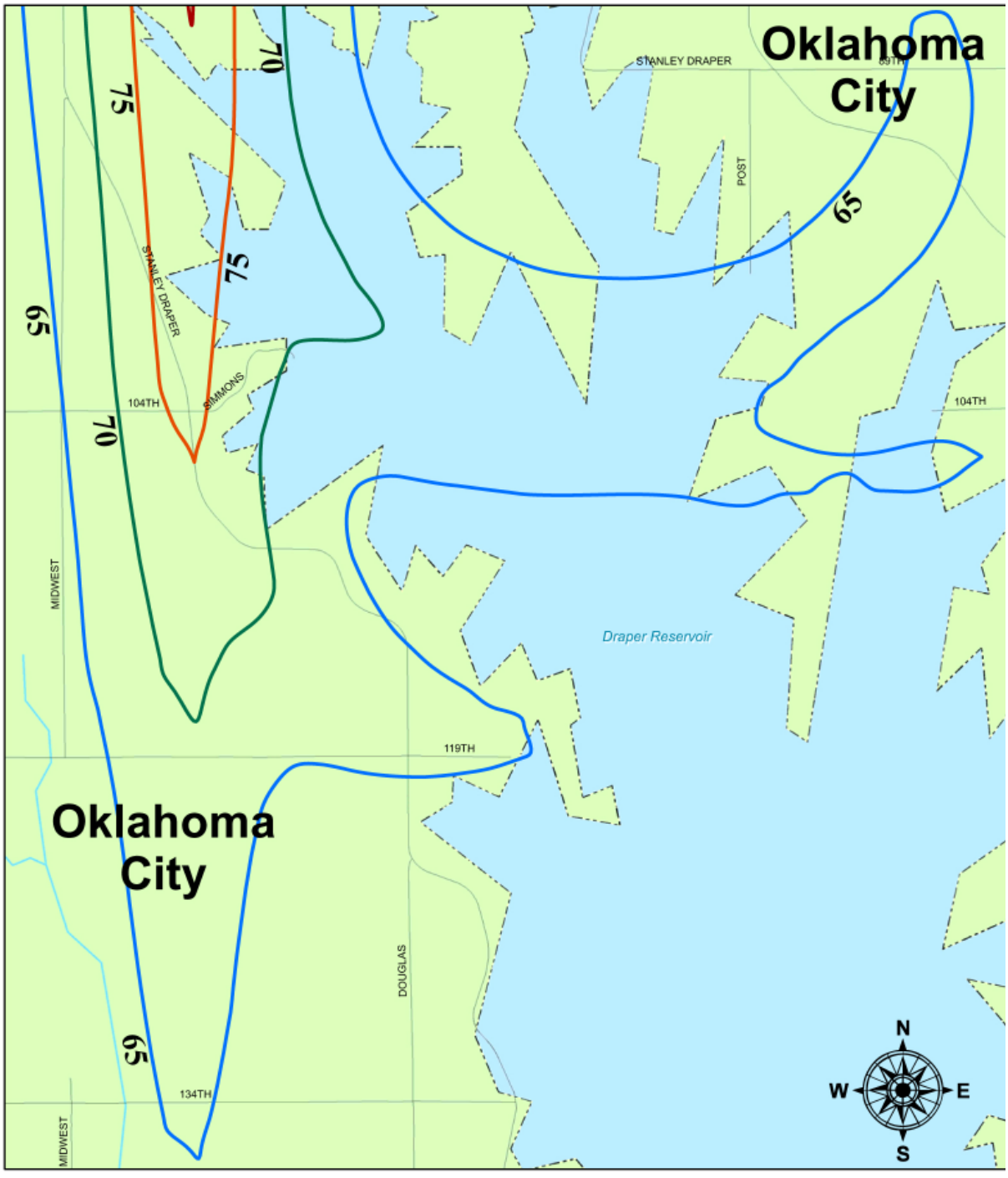


2006 AICUZ Noise Contours

65 70 75 80

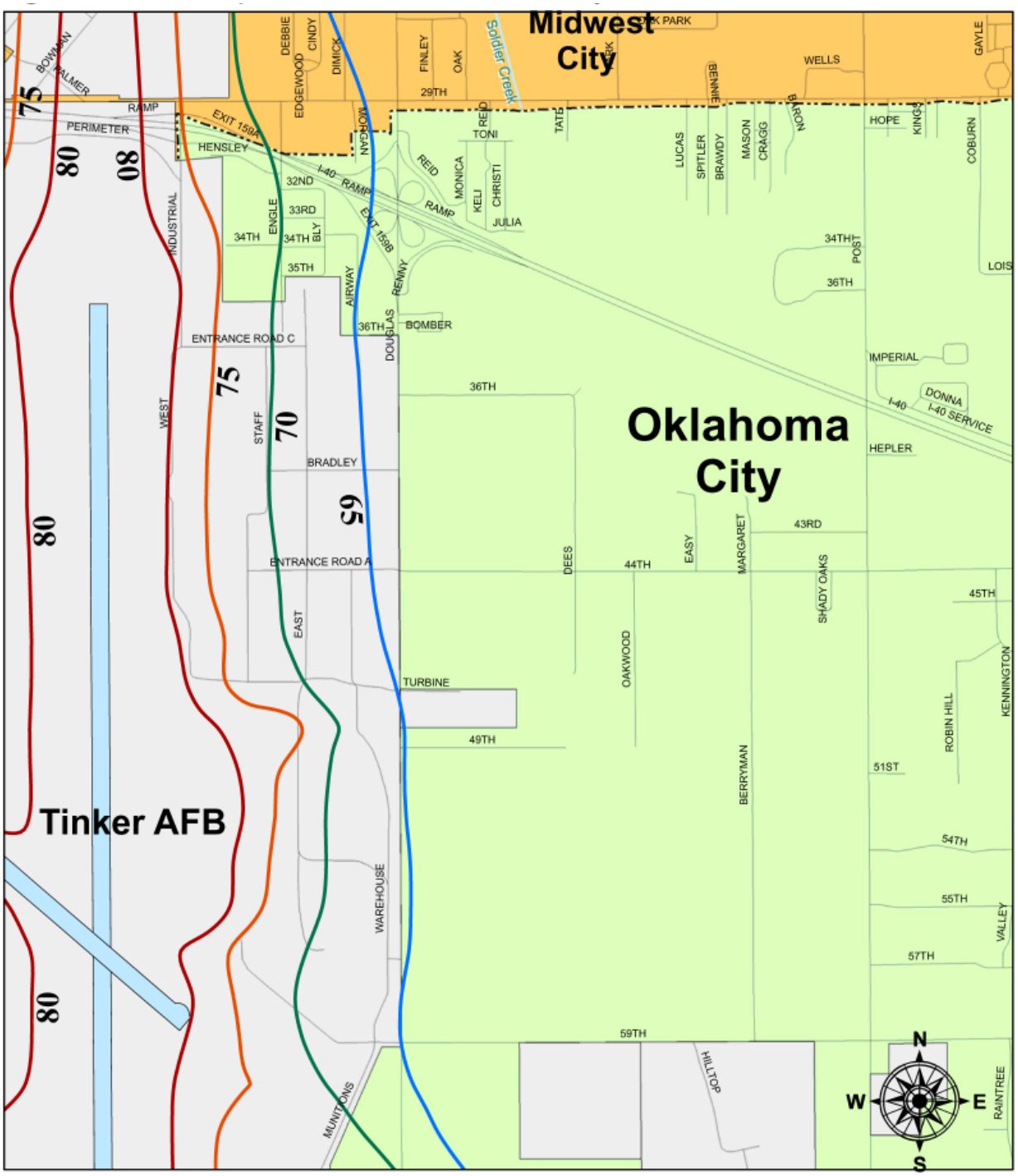
Source: Created from Data Received from ACOG and Tinker AFB

Figure 6.4.b Properties in Oklahoma City Located in the 65+ dB DNL



Source: Created from Data Received from ACOG and Tinker AFB

Figure 6.4.c Properties in Oklahoma City Located in the 65+ dB DNL

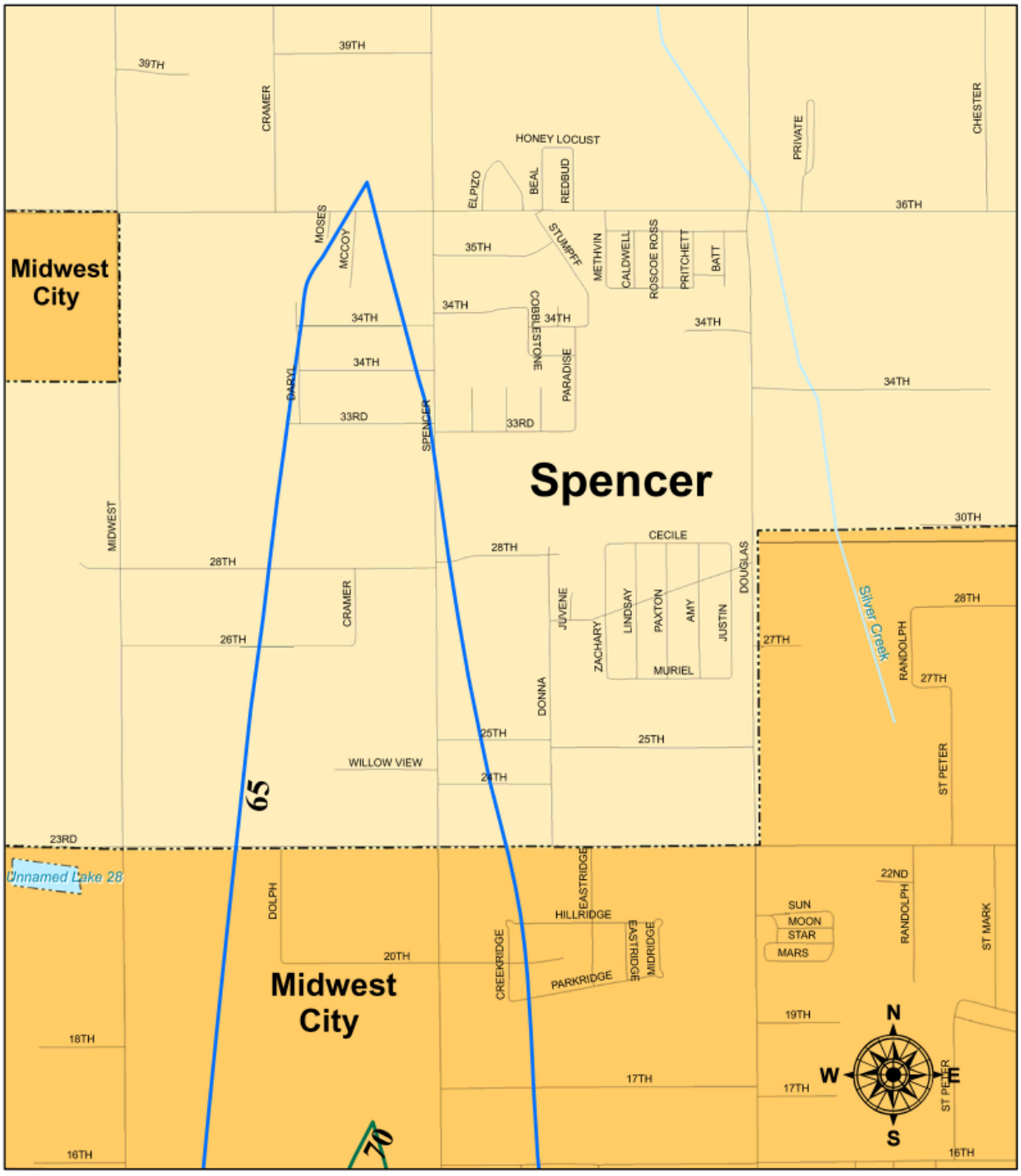


2006 AICUZ Noise Contours

65 70 75 80

Source: Created from Data Received from ACOG and Tinker AFB

Figure 6.5 Properties in the City of Spencer Located in the 65+ dB DNL



2006 AICUZ Noise Contours

65 70 75 80

Source: Created from Data Received from ACOG and Tinker AFB

6.4 Concept of Sound Transmission Class

The basic concept of the Sound Transmission Class (STC) can be defined as a partition's or material's ability to block airborne sound. STCs are expressed in single-number acoustical ratings to provide a quick and simple method of building-element selection to meet the desired acoustical requirements. The STC was originally established to provide some measure of speech privacy between rooms, based primarily upon frequencies important in human speech. However, by analyzing the transmission loss for each frequency and comparing this with an aircraft noise spectrum, it is possible to establish the STC value needed to meet a given decibel reduction.

Sound transmission class is defined under the American Society for Testing Materials Standard E413-87. STC is derived from the use of a standard curve that is fitted to the observed laboratory data. The higher the STC number, the better the isolation. An STC value of 20-25 would indicate that even low speech would be audible in an adjoining room. An STC value of 50-60, on the other hand, would indicate that loud sound would be heard only faintly or not at all. So, an STC rating of 25 means a reduction in outside noise by approximately 25 decibels.

6.4.1 Overall Noise Level Reduction

All Air Force bases and airports have designated noise contours. The U.S. Air Force has established sound isolation standards designed to provide outdoor-to-indoor NLR of 25, 30 and 35 (found in the *U.S. Air Force Recommendations for Insulation of Residential Structures Against Aircraft Noise*). Table 6.1 shows the typical interior sound levels desired for various types of uses/structures.

Table 6.1 Structure Performance Standards	
Land Use	**Typical Interior Sound Level**
Residential	45 dB
Educational/Medical/Churches, etc.	45 dB
Cultural/Entertainment/Recreational	50 dB
Office/Commercial/Retail	50 dB
Services	50 dB
Industrial/Communication/Utility	60 dB
Agricultural Land/Water Area/Resource Extraction	60 dB

Source: American Society of Testing and Materials

The overall NLR required within a given noise zone can be determined by subtracting the desired level (45 dB) from the highest noise level within that contour. For example, in the 70 dB DNL, the required reduction to obtain an internal 45 dB for residential structures is calculated as 70 – 45 = 25 dB. Table 6.2 shows how small modifications can have a big impact on noise reduction.

Table 6.2 Sample STC Ratings	
2 × 4 on 16” or 24” centers, 3/8-5/8 inch wallboard, rock wool or fiberglass batting	STC 30 to 42
Same as above with plaster instead of wallboard	STC 40 to 54
Staggered stud 2 × 4’s on 2 × 6 plate, 2 sheets of 5/8 inch plasterboard on each side, 2” fiberglass inside	STC 51

Source: Data from IBC 2006

6.4.2 Building Codes and Noise

Building codes are designed to insure the safe construction and reconstruction of buildings. Most cities adopt a standard building code. Codes adopted for local use can be modified to specify construction techniques to reduce internal noise levels. These techniques may be specified for structures within a 65 dB DNL contour.

Existing buildings would not be subject to the construction provisions of the code unless they were being modified. Communities using building codes to insure sound attenuation near Tinker AFB should consider building code revisions designed to reinforce sound attenuation when remodeling or renovations are considered.

Many factors affect the level of sound that can be transmitted through the exterior of a building. However, the International Building Code (IBC), all versions since 2000, includes standards for the interior noise environments (see Group R of Section 325). This code recommends residential interior environments be designed and constructed to achieve an interior noise level of 45 decibels when measured against airborne noise generators.

Moreover, noise reduction achieved through building construction is effective only if the building envelope is sealed when the noise is generated.

6.5 Noise Attenuation

Land use/noise compatibility is implemented through both preventive and corrective noise mitigation measures. The preventive measures apply primarily to undeveloped areas of the community where land use designation, zoning controls, building performance standards and project development proposals for new development are reviewed by the affected governmental units for consistency with the compatibility guidelines.

Preventive noise attenuation measures are those required in addition to attenuation provided by buildings as commonly constructed in an area. **Measures that reduce external noise at a site should be used wherever practicable.** Building designs and construction techniques that provide more noise attenuation than typical construction may be employed also to meet the noise attenuation requirements.

The corrective land use measures apply primarily to developed areas of communities where mitigation of incompatible land uses is necessary. Acquisition and redevelopment of property and sound insulation of sensitive land uses (such as residences, schools, churches, nursing homes, etc.) are two of the most important measures used in a noise mitigation and reduction program. Acquisition as a noise remedy is not only costly but it can also disrupt social networks, undermine education and social institutions and lower tax bases. It is limited to those areas where jet noise is the worst. Houses that cannot be purchased but endure noise peaks of near 80 dB must be addressed by other remedies.

Avigation easements and other purchased rights have also been effective resolutions to noise related impacts.

6.5.1 Research, Development and Abatement

Military and civilian noise planning efforts have benefited from mutual interest and efforts. One area is research and development. Developing quieter engines for the KC-135, for example, came about through commercial efforts to reduce fuel costs and noise impacts of the Boeing 707. Other efforts have gone into developing engine test facilities, or hush houses, where engines can run at full power with dramatically reduced noise effects to the surrounding environment. Noise abatement procedures are also practiced in Air Force flight scheduling and aircraft operating procedures. Modification to flight tracks, imposition of quiet hours, and use of preferential runways are techniques used by both the military and civilian airfields to reduce noise. At most installations, however, Air Force noise reduction efforts have been used to their maximum degree, and land use planning and controls are the answer for further protection of the community.

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SECTION VII
Recommendations: Short and Long Term

KC-135 aircraft arrive
Two KC-135R aircraft arrived at Tinker from the 939th Air Refueling Wing in Portland, Ore. The aircraft are two of the four authorized by the 2005 Base Realignment and Closure process. (Air Force photo)

7.1 Acronyms and Abbreviations

ACOG	Association of Central Oklahoma Governments
AEZ	Airport Environs Zone
AFB	Air Force Base
AICUZ	Air Installation Compatible Use Zone
ANSI	American National Standards Institute
APZ	Accident Potential Zone
BOCA	Building Officials and Code Administrators
BRAC	Base Realignment and Closure
CZ	Clear Zone
dB	decibel
DNL	Day-Night Average Sound Level
DoD	U.S. Department of Defense
FAA	Federal Aviation Administration
FAR	Federal Aviation Regulations
FCC	Federal Communications Commission
IBC	International Building Code
JLUS	Joint Land Use Study
STC	Sound Transmission Classification
TDR	Transfer of Development Rights
USAF	U.S. Air Force

7.2 Background

Sim training
Airmen and civilians from the 552nd Air Control Wing work in the mission simulators during a training exercise. The programs used in the mission sims, as well as in the E-3 Sentry itself during real-world missions, are written, tested and released for use by Airmen in the 552nd Communications Group. (Air Force photo by Staff Sgt. Stacy Fowler)

The three critical areas in which airfield land use compatibility issues occur are:

- **Safety**: Land beyond the ends of the runway and other areas of the community routinely flown over by aircraft to and from the airport; these are the sites where accidents are statistically more probable.
- **Height Hazards**: Flight takes place in a horizontal and vertical environment; therefore, this space must be kept clear of natural or built objects that penetrate this airspace. These areas surround an airfield or are under low level air routes where the penetration of structures will create hazards to aerial navigation.
- **Noise**: The measurable sound generated by aircraft flight or ground operations perceived by persons on the ground as annoying or having detrimental health effects.

When balance is not achieved between these three critical areas, land use challenges occur. **Safety** concerns, in general, present the greatest challenge to land use decision-makers. Since a majority of aircraft accidents occur within 5,000 feet of a runway [see Table 4.1], the ability of a pilot to bring an aircraft down in a manner that minimizes the severity of an aircraft accident is often dependent upon the types of land uses existing within the area on and adjacent to an airfield.

Local governments have the responsibility to protect the health, safety and general welfare of their citizens. Therefore, they have an obligation to demonstrate that they have exercised due diligence when establishing policies regarding land use and when granting zoning that permits land development adjacent to airfields.

Height hazards contribute to the loss of navigable airspace, particularly within the flight critical airspace at the approach or departure ends of runways. These vertical encroachments create hazards to flight activities and subsequently to people and property on the ground. These obstructions can inhibit safe and efficient aircraft operations.

Noise is the most negative perceived impact associated with airports and military bases. A simplified definition of noise is unwanted sound. Sound, itself, can be accurately measured, but perception is subject to considerable variability.

The perception of a particular sound event as noise is not subject to objective measurement. Therefore, most noise research attempts to focus on acceptability to the whole community rather than individuals.

In addition to the subjectivity of noise, two main aspects of sound/noise that affect noise regulation decisions are:

- **Physiological**: Temporary effects include startled reactions and sleep interference; permanent effects include actual physical injury such as deafness.
- **Behavioral**: Usually measured by interference in activities, speech interference and the interruption of listening pleasure are the most common effects cited; interruption of concentration and sleep disruption are also included.

A variety of tools related to noise mitigation were evaluated based on criteria such as:

- Feasibility
- Likely effectiveness
- Availability of resources for implementation
- Ability to protect the military mission(s) and installation sustainability
- Ability to protect the economic health of the region and individual property rights
- Overall ability to protect health, safety, welfare, and quality of life

These tools are also intended to address a variety of possible land use and operational issues, including: physical adjacency to Tinker AFB; conservation or natural resource value, noise, vibration, dust, smoke, air safety (both for people on the ground and for pilots); the physical security of the installations; the need for flexibility to accommodate expanding existing and future military missions; and visual compatibility.

7.3 Consideration of Tinker AFB Flight Tracks

Recognizing that any change in permitted land uses around an air field is not a simple matter, issues such as pre-existing rights, non-conforming uses, claims for compensation, etc. should be considered. These are issues that are commonly addressed when there are proposed changes to land use or land planning guidelines. Ultimately, a decision, which balances competing needs and wants, has to be made by the planning authorities of affected jurisdictions.

Active aircraft noise management strategies are those directed at reducing the community noise level through imposing controls on the source of the noise (i.e. the aircraft and engine maintenance). These approaches include controlling:

- How much noise is emitted by each aircraft through aircraft noise certification
- Where the noise is emitted by imposing noise abatement flight paths and/or flight path corridors
- When the noise is emitted by using tools such as curfews
- Total amount of noise which is emitted by air field movement caps and other restrictions
- Design and location of engine maintenance and testing facilities

Passive approaches, on the other hand, are those directed at reducing the community aircraft noise level and/or reaction by protecting the receiver from the noise. In broad terms these approaches can be broken down into **restrictive** measures (i.e. those which stop people from doing certain things) and/or keeping people away from noise and approaches directed at **assistance.**

Examples of assistance measures supporting strategies and actions in place are:

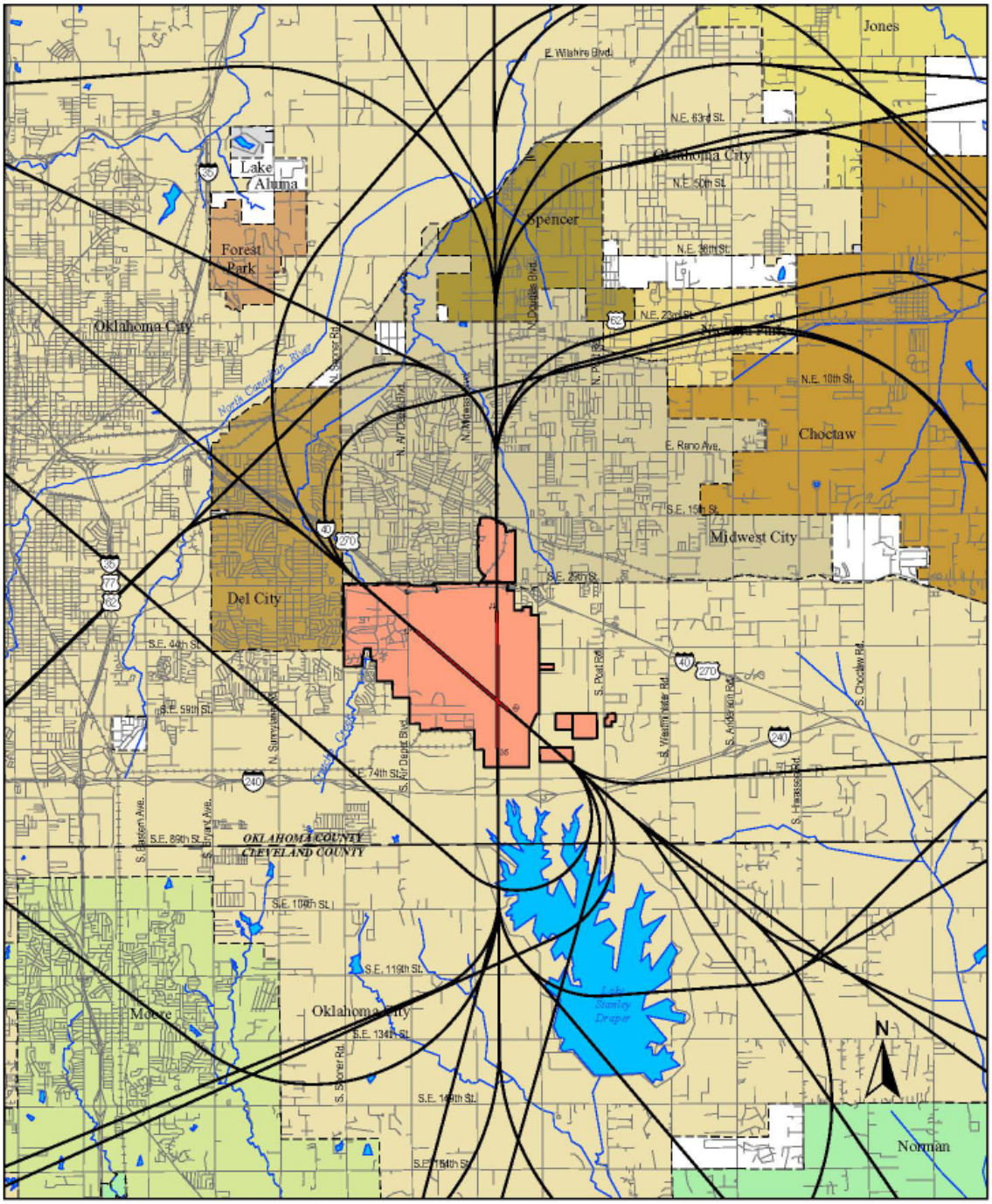
- Real aircraft noise disclosure strategies
- Assisting people to leave noise affected areas through property acquisition and relocation assistance programs
- Protecting people who are exposed to high levels of aircraft noise through acoustic insulation of residences and other areas of high human occupancy
- Assisting future noise tolerant activities to locate near an airfield

The assistant measures listed above are basically aimed at selectively finding a noise tolerant population that has no objection to living near or under flight paths. Under the current land use approaches, noise sensitive land uses are addressed. However, there should be consideration given to busy flight paths that are outside the noise contours. While these locations are less affected by noise because of the altitude of the planes, they are affected by the frequency of flights overhead. Arguments can be made that, at the very least, land use planning decisions should take into account both noise contours and the location of busy flight paths.

The Tinker AFB departure, arrival and closed pattern flight tracks are illustrated in Figures 7.1, 7.1.a and 7.1.b respectively.

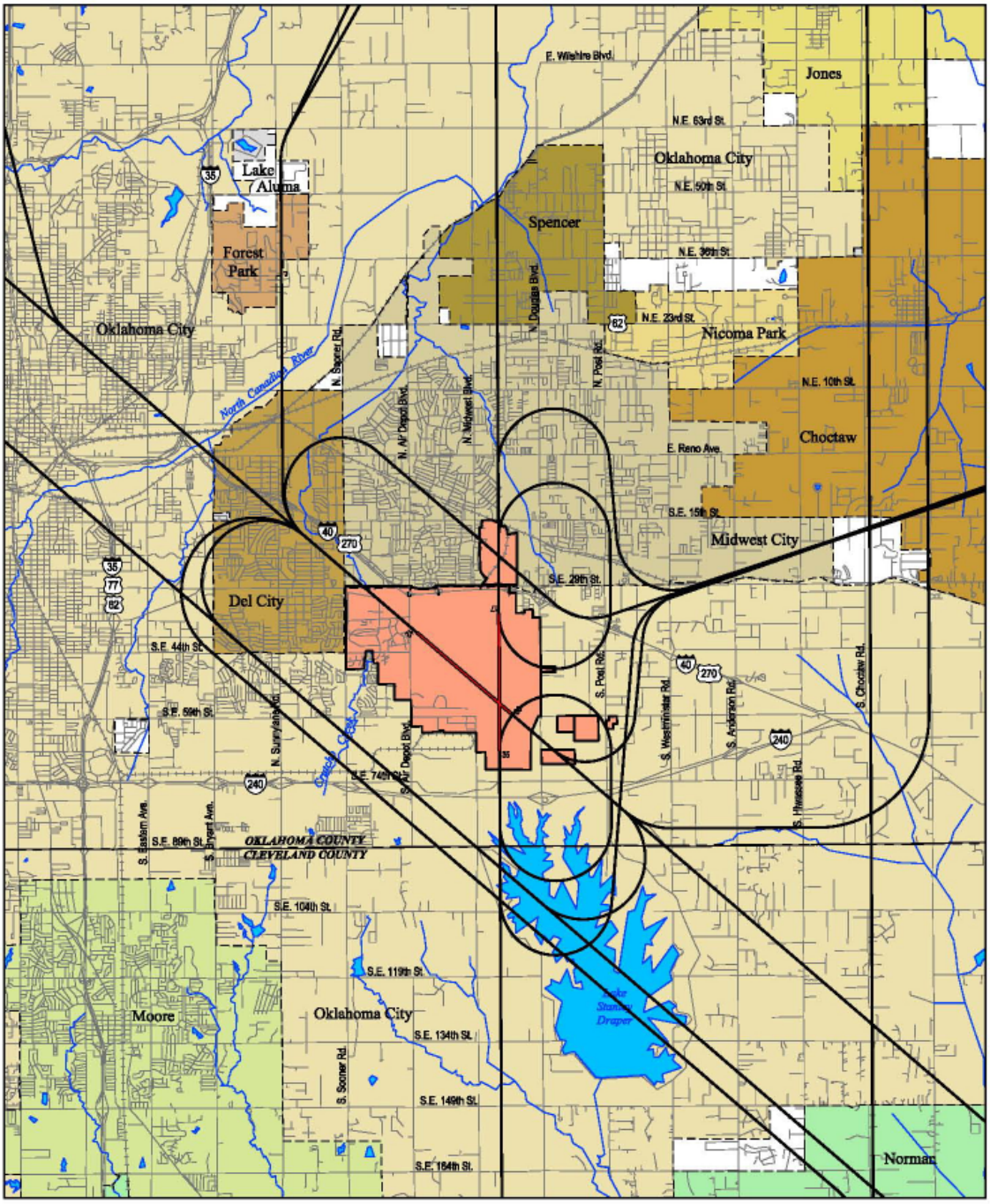
Noise sensitive individuals would be greatly assisted and be less likely to be placed in an undesirable situation, if they were advised of the location of the flight paths and noise contours and had information on the activity levels on the flight paths before they make a decision where to purchase or construct a house. Similar arguments apply to proposals to construct assembly venues in the vicinity of flight paths and higher noise areas.

Figure 7.1 Tinker AFB Departure Flight Tracks



Source: 2006 Tinker AFB AICUZ Study

Figure 7.1.a Tinker AFB Arrival Flight Tracks



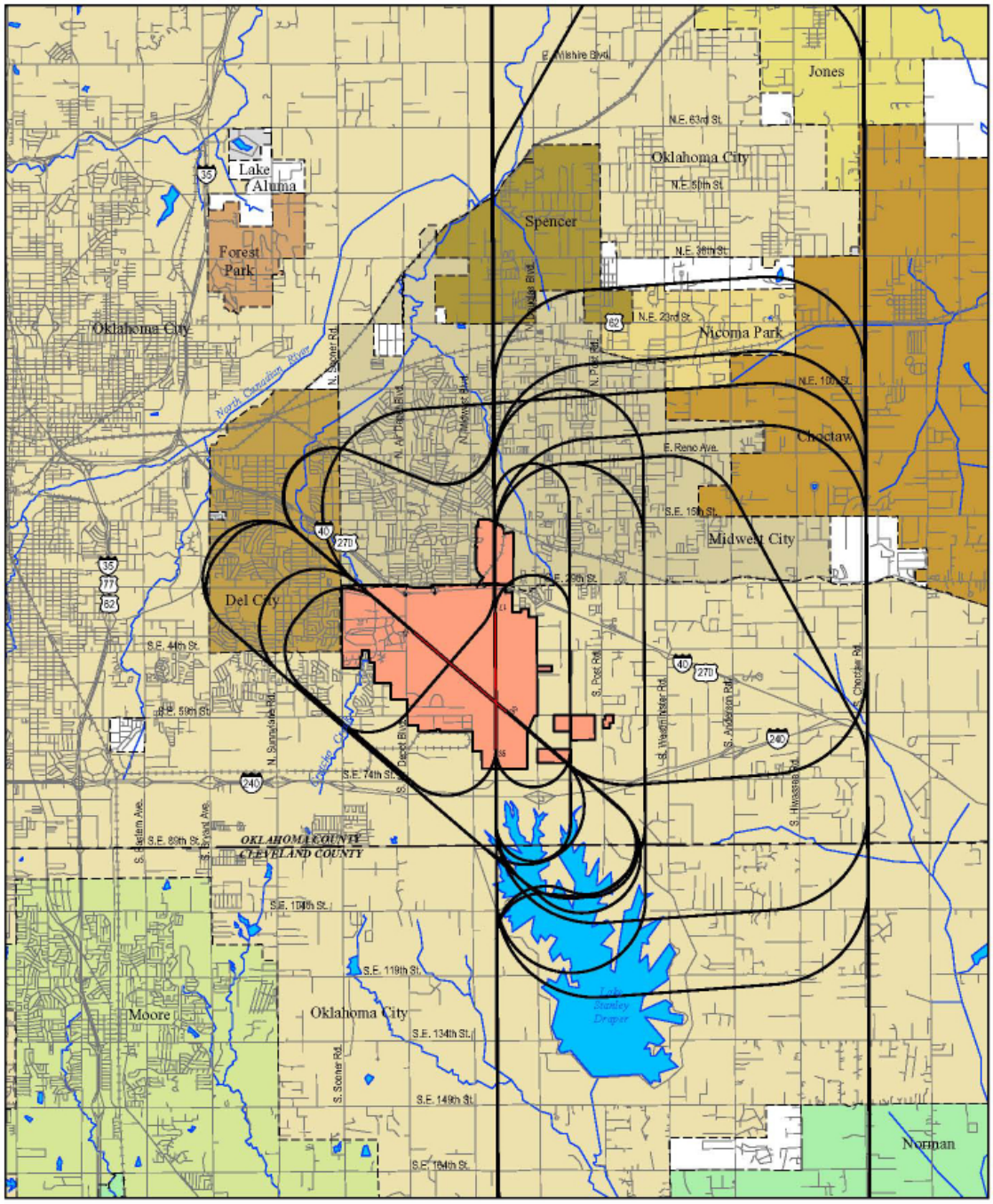
Source: 2006 Tinker AFB AICUZ Study

LEGEND

- Flight Track
- Runway
- Roadway
- City Limits
- Tinker AFB

Note: Unincorporated areas are not shaded.

Figure 7.1.b Tinker AFB Closed Pattern Flight Tracks



Source: 2006 Tinker AFB AICUZ Study

7.4 Regulatory Land Use Modifications

The purpose of this Joint Land Use Study is to provide guidance regarding land use decisions by the local governments in the vicinity of Tinker AFB, but it is not a legal document and has no force of law to ensure its recommendations are implemented.

Both local governments and the military installation should establish and maintain partnerships with federal, state, and non-profit agencies as potential sources of implementation funding.

Military planners and officials should continue to work with local communities to educate the community about how best to protect the Base's mission. The civilian and military communities should actively participate in the identification of appropriate areas for protection and any subsequent recommended acquisition, while identifying available county, state and federal grants and programs, as well as opportunities for potential partnerships with non-profit organizations. The results of these joint efforts should be shared with the stakeholders. Developing an effective land use plan must include the current mission of Tinker AFB, while recognizing requirements for potentially expanding the mission. Planners should possess a clear understanding of any areas to consider for acquisition. Community officials should work jointly with military officials to determine these areas and reach consensus.

A two-pronged approach is recommended for establishing both a short term and a long term strategy.

7.5 Short-Term Recommendations

The following immediate short term action steps are recommended within the next one to four years and are described further in this Section.

- Modification of land use policies regarding rezoning (see below)
- Incorporation of noise level reduction measures into building codes
- Enforcement of existing zoning regulations modifying them as new AICUZ studies are released, thus bringing them into compatibility with the Air Force recommendations. However, communities may choose to be more restrictive than the latest AICUZ Study in terms of noise contour coverage and noise abatement requirements.
- Adoption of maximum land use densities for permitted land uses within the AICUZ APZs that are consistent among the affected jurisdictions (see Section 7.6)
- Modification of comprehensive plans to minimize incompatible land uses in and around the Base and avoid potential further encroachment through creation of a new land use category (see below)

Modification of land use policies regarding rezoning:

- Establish land use policies against zoning land to any category permitting residential development within the 75 dB DNL or higher contour, or within the 65-74 dB DNL contour unless sound attenuation will be achieved.
- For undeveloped properties located in the APZs, review zoning district designations and allowable uses for compatibility and bring zoning and allowable land uses into conformity with recommended density guidelines.

The purpose of creating a new land use category is to promote the appropriate type and intensity of land use development surrounding Tinker AFB. The purpose of designating lands that are most affected by military aircraft traffic and potential accident hazards adjacent to runways is to minimize population, eliminate hazards to aircraft operations and protect the general welfare and safety of citizens within these areas. **This new category, at a minimum, should be applied to the Accident Potential Zones (all APZ I and II areas) as defined in the 2006 Air Installation Compatible Use Zone (AICUZ) Study for Tinker AFB.** Delineation of these zones should be reflected on local Comprehensive Plans, and future land use maps and match those shown on the following figures for each jurisdiction.

7.6 Recommended Low Density Standards for APZ I and APZ II

Through the AICUZ Study, the U.S. Air Force makes land use compatibility recommendations and suggests that compatible land use be “low density”. However, the U.S. Air Force does not specifically define low density. Therefore, the following definitions for low density residential, commercial and industrial development were developed through the collaborative efforts of the JLUS partners. The following recommendations are intended to provide the jurisdictions that regulate development within Accident Potential Zones adjacent to Tinker AFB with consistent definitions that can be incorporated into their zoning ordinances.

Residential Density

It is recommended that residential density for new residential construction in APZ II should be limited to four (4) dwelling units per gross acre and lot coverage not to exceed 30% for the home and garage. The majority of the residential property in APZ II is already subdivided with minimum lot sizes of 6,000 to 6,600 square feet in Midwest City and Del City. According to a University of Oklahoma study, Midwest City Residential Housing Market Analysis, and the Census Bureau, the average home size in Midwest City is approximately 1,460 square feet and is a one story structure. Using this average house size for both Midwest City and Del City, the average lot coverage is 22% to 25% with existing homes. Restricting the number of housing units per acre to four (4), with maximum lot coverage of 30% for new construction, establishes a low density population in residential areas in APZ II. An average household size of 2.5 people results in approximately 10 people per acre.

In order to determine the recommended low density standards per acre in APZ II, a maximum density criteria was established using a residential lot size of no less than 6,000 square feet. Assuming thirty percent of the acre would be deducted for streets and other infrastructure, probable human density could be established by taking the acre of land (43,560 square feet) and deducting thirty percent to find the remaining developable land. The remaining developable square footage in this scenario would be:

43,560 square feet x remaining 70% of buildable area = 30,492 square feet

If the remaining 30,492 square feet were subdivided using the minimum lot size of 6,000 square feet, lot number and size would be as follows:

30,492 square feet / 6,000 square feet = 5.082 or 5 developable lots

30,492 square feet / 5 lots = 6,098 square feet/developable lot

All of the currently platted and developed lots in Midwest City containing 6,600 square feet would actually exceed this recommended requirement by only allowing four lots per gross acre.

Using the average number of individuals per household for Del City (2.44/household), taken from the Census Bureau's website, the population density for low density residential in the APZ II would be around 12 people per acre in Del City and 10 people per acre in Midwest City.

Using a smaller residential lot size would allow some flexibility for these communities and would allow for the continuation of existing home sites. In most cases, the building coverage on the smaller lots appears to cover twenty percent or less of the lot. Whether the dwelling unit is a single or two-story structure is not a factor in calculating low density. Therefore, this recommended definition of low density residential seems reasonable for this JLUS.

Commercial and Industrial Density Recommendations

Using information provided by the Institute of Transportation Engineers (ITE), the average occupancy in single vehicles is currently up to one and one-half people. Then using parking ratios for various land uses, i.e. retail, commercial, and industrial; a square footage calculation for any building may be derived.

In APZ I, population density should be restricted to 25 people per gross acre. A density of 25 people per acre divided by 1.5 people per vehicle yields a parking space count of 16.6 spaces rounded up to 17 whole parking spaces.

Commercial lot coverage should be restricted based upon a parking ratio of one parking space for each 300 square feet of building. 17 parking spaces times 300 square feet equals 5,100 square feet of building. The maximum lot coverage would be 11.7 percent and would be restricted to a one story building. [5,100 divided by 43,560]

Industrial lot coverage should be restricted based upon a parking ratio of one parking space for each 1,000 square feet of building. 17 parking spaces times 1,000 square feet equals 17,000 square feet of building. The maximum lot coverage would be 39 percent and would be restricted to a one story building. [17,000 divided by 43,560]

In APZ II, population density should be restricted to 50 people per gross acre. A density of 50 people per acre divided by 1.5 people per vehicle yields a parking space count of 33.3 rounded up to 34 parking spaces.

Retail lot coverage should be restricted based upon a parking ratio of one parking space for each 200 square feet of building. 34 parking spaces times 200 square feet yields 6,800 square feet of building. The maximum lot coverage would be 15.6 percent. [6,800 divided by 43,560]

Commercial lot coverage should be restricted based upon a parking ratio of one parking space for each 300 square foot of building. 34 parking spaces times 300 square feet yields 10,200 square feet of building. The maximum lot coverage would be 23.4 percent. [10,200 divided by 43,560]

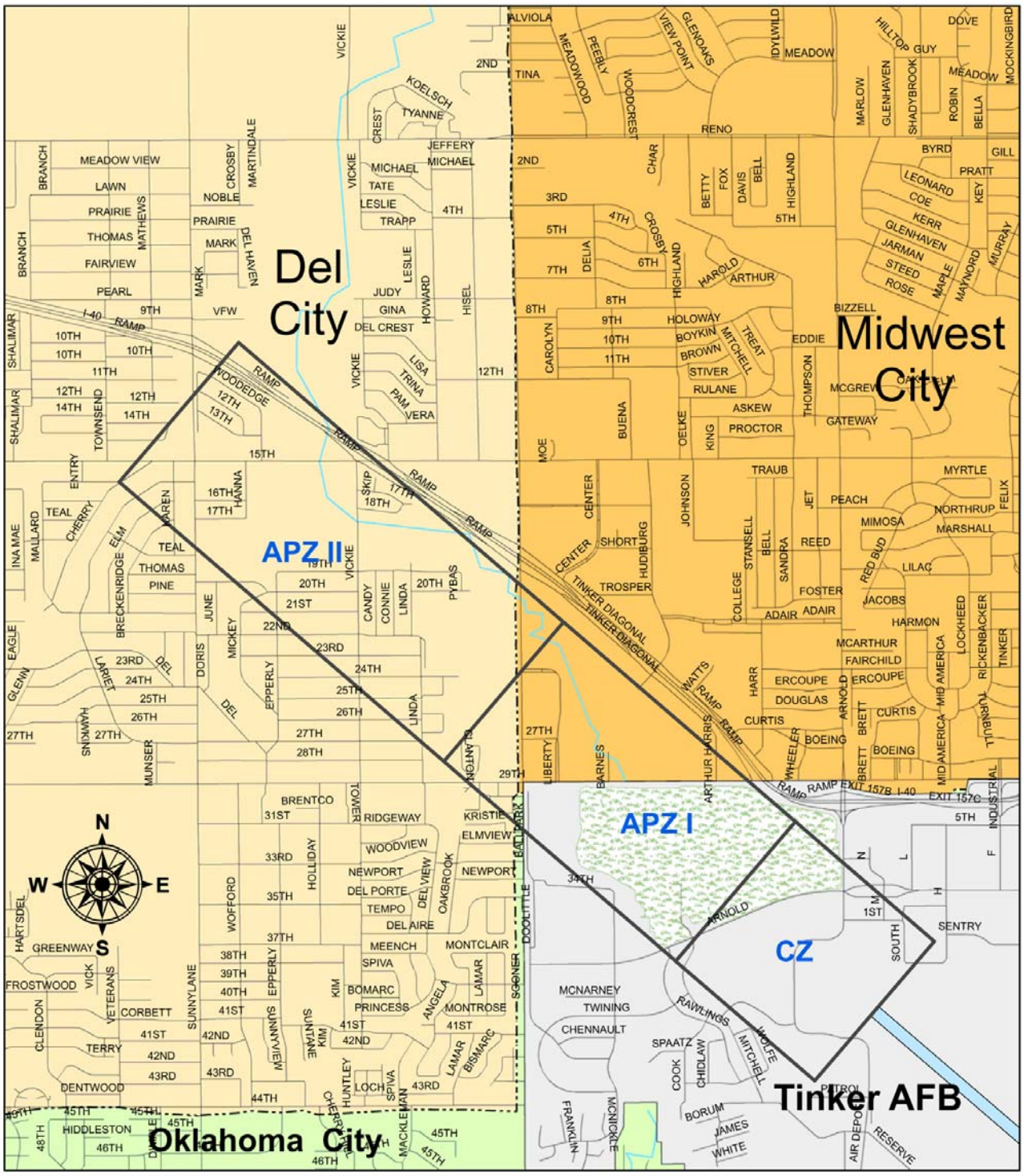
When a combination of retail and commercial uses are combined on one lot (a mixed use environment) the maximum lot coverage would be 15.6 percent.

Industrial lot coverage should be restricted based upon a parking ratio of one parking space for each 1,000 square feet of building. 34 parking spaces times 1,000 square feet yields 34,000 square feet of building. The maximum lot coverage would be 78 percent. [34,000 divided by 43,560]

Note: in APZ II two story structures may be constructed, however building square footages should not exceed the total square footage allowed by a one story building that maximizes the maximum lot coverage. [For instance: a retail building with lot coverage of 15.6 percent allows a 6,800 square foot building on one acre of land. A two story building should not exceed the total square footage of the maximum building allowed by the lot coverage which is 6,800 square feet in this example.]

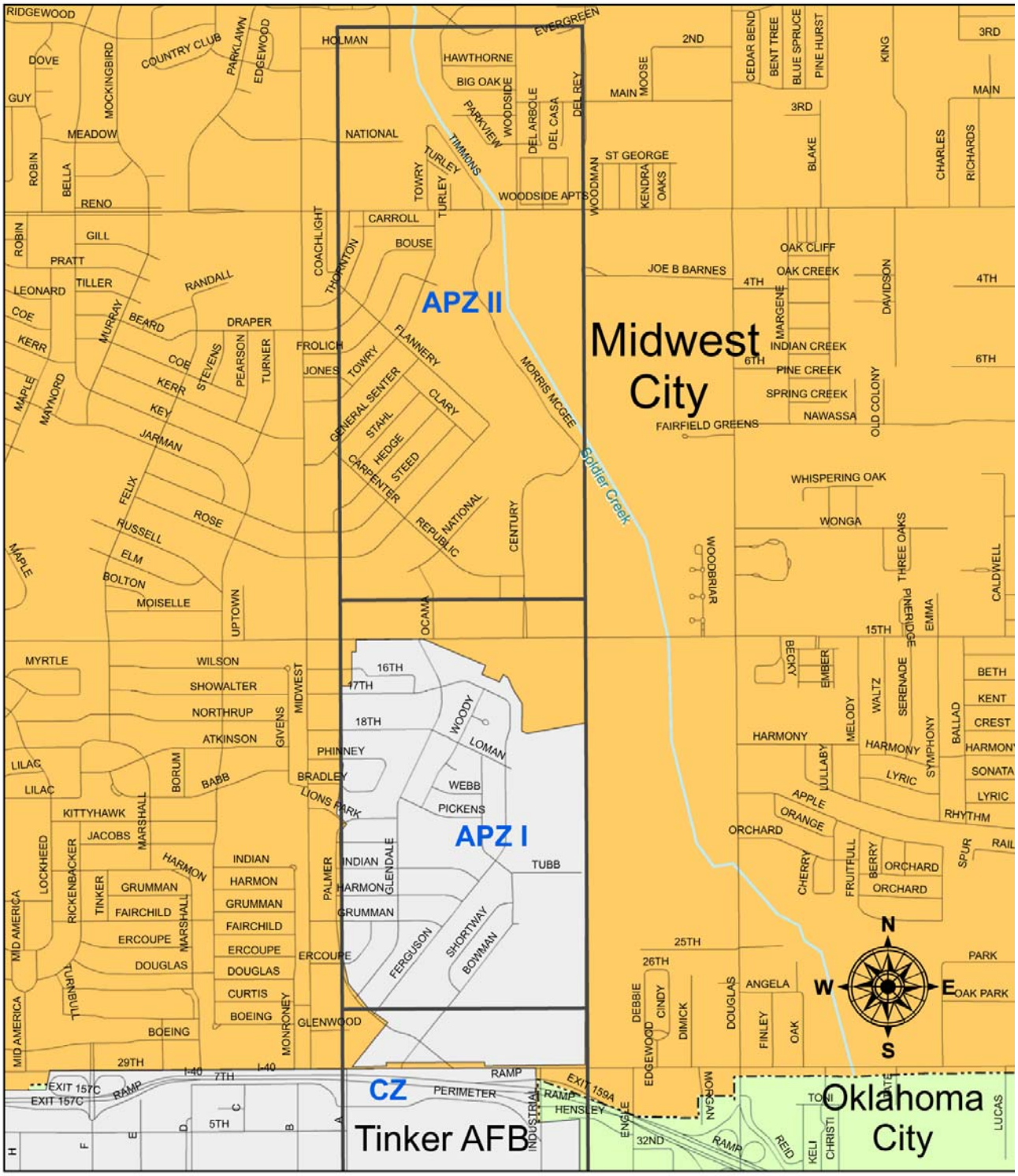
Additionally, safety exposure risks within APZ II should be limited by restricting or prohibiting uses that congregate population densities larger than the recommended 50 people per gross acre. Refer to Table 4.3 for specific land uses.

Figure 7.2 AICUZ APZ/CZ Areas - Del City and Midwest City



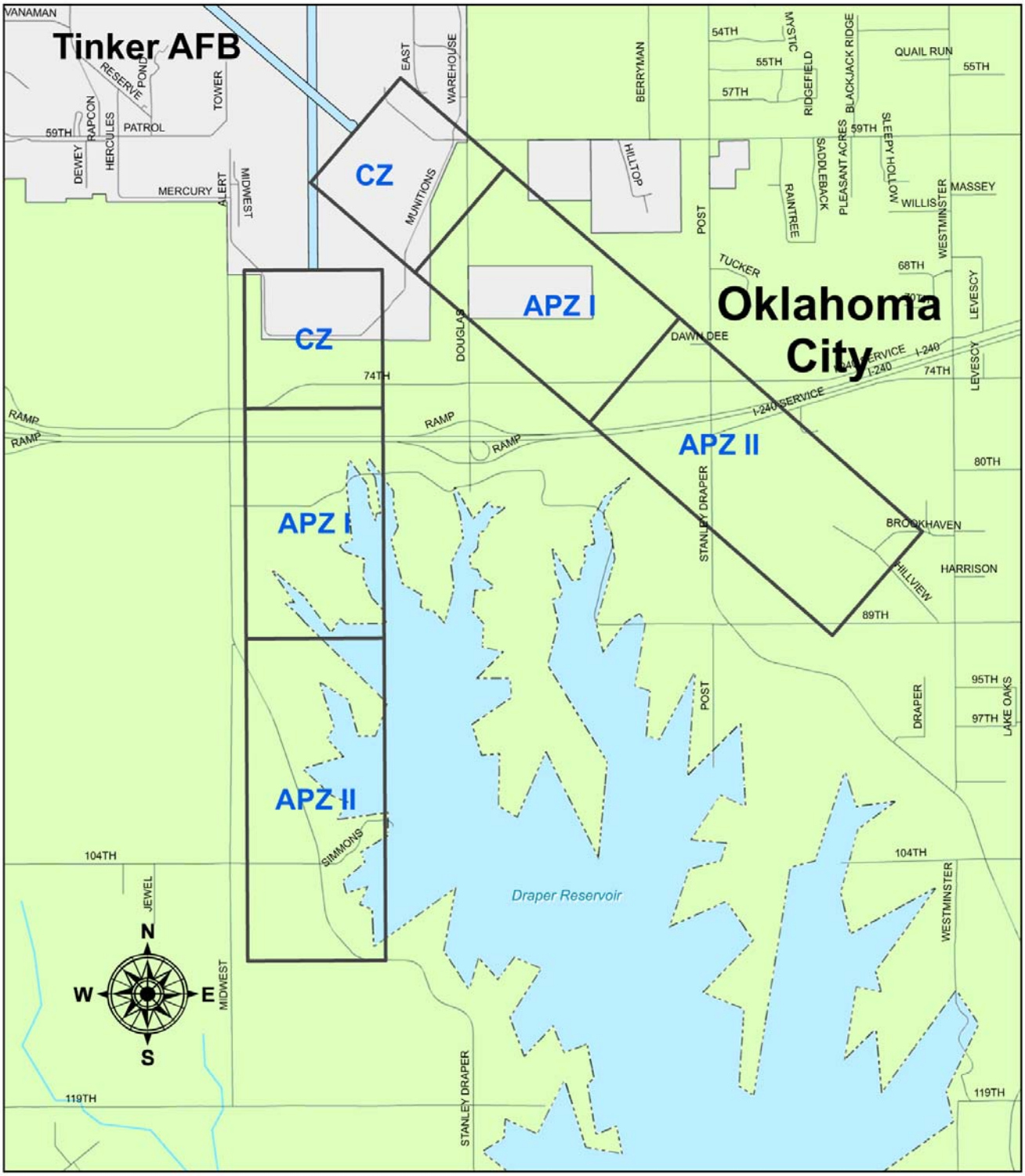
Source: Created from Data Received from ACOG and Tinker AFB

Figure 7.3 AICUZ APZ/CZ Areas - Midwest City



Source: Created from Data Received from ACOG and Tinker AFB

Figure 7.4 AICUZ APZ/CZ Areas - Oklahoma City



Source: Created from Data Received from ACOG and Tinker AFB

7.7 Long Term Recommendations

Long term recommendations for minimizing land use conflicts that could affect Tinker AFB's mission capability focus on the remaining undeveloped land within the 2006 AICUZ noise contour areas and APZs. These recommendations should be implemented within the next five to seven years since the Base's activities could increase as a result of the assignment of additional military aircraft operations, which may impact land within the JLUS study area.

7.7.1 Purchase of Land in AICUZ Accident Potential and Noise Zones

For properties most impacted by accident potential or extreme noise levels, jurisdictions could consider the purchase of land as an alternative to regulatory methods for preserving land within such areas. Fee-simple purchase of impacted land is the most permanent form of land use control that may be considered.

7.7.2 Acquire Easements for AICUZ Accident Potential and Noise Zones

In addition to fee-simple acquisition of land, use avigation easements to address flight and noise related matters in both noise sensitive areas and APZs. Easements can be an effective and permanent form of land use control as described further in this section.

Midwest City has a provision within its codes that states:

> *"All subdivision, zoning or building permit requests within the Accident Potential Zone One for Runways Number 12/30 and 17/35 of Tinker Air Force Base shall grant an avigation easement to the City of Midwest City as a condition of subdivision, zoning or building permit approval. This easement shall hold the city, public and Tinker Air Force Base harmless from any damages caused by noise, vibration, fumes, dust, fuel, fuel particles, or other effects that may be caused by the operation of aircraft taking off, landing, or operating on or near Tinker Air Force Base, not including the physical impact of aircraft or parts thereof.*

Avigation easements shall be submitted on easement forms provided by the City of Midwest City."

Continuous testing
The probe rake of AEDC's continuous sweep emission measurement system, the taller vertical structure to the left, is seen in this video still taken during the alternative fuels testing of the B-52 engine. (Air Force still from video)

In 1992, the Air Force's AICUZ Handbook, A Guidance Document for Air Installation Compatible Use Zone (AICUZ) Program, Midwest City served as the model for avigation easement and compatibility in land use zoning in the CZ and APZ I zones.

Although Nicoma Park and Choctaw are not directly affected by the 65 dB DNL noise contour or the APZs, they are affected by flight path corridors. Consideration should be given to incorporating an avigation easement program into their land use regulations, particularly for school siting and other high density and public uses for those areas located underneath flight paths.

7.7.2.a Voluntary Acquisition and Noise Mitigation

Local governments with property located within the APZs, using their own source of funding, could consider providing a voluntary acquisition program for residential properties and vacant land located within the APZ areas. Voluntary acquisition is one of several effective measures for noise and incompatible land use mitigation.

Federal legislation supports the idea of voluntary acquisition through noise mitigation or noise compatibility programs. Under section 104(a) of the Aviation Safety and Noise Abatement Act of 1979, an airport operator, including those on military bases, who has previously submitted a noise exposure map may submit to the Federal Aviation Administration (FAA) a noise compatibility program which sets forth the measures taken or proposed by the airport operator for the reduction of existing incompatible land uses and prevention of additional incompatible land uses within the area covered by the noise exposure maps. The Act requires such programs to be developed in consultation with interested and affected parties including local communities, government agencies, airport users, and FAA personnel.

If an acquisition will involve the displacement of individuals, families, business concerns, farm operations or nonprofit organizations, a relocation plan should be developed. The primary intent of a relocation plan is to identify the needs of occupants who are going to be displaced, and to relate this to the available supply of comparable replacement properties.

In addition, in 2002, federal legislation (Agreements to Limit Encroachments and Other Constraints on Military Training, Testing, and Operations) granted authority to DoD to partner with local governments and conservation organizations to assist in acquiring land near military installations from willing sellers when the acquisition can protect both the environment and the military mission. Purchasing development rights can compensate the owner for the assessed market value of development potential lost when the land remains permanently undeveloped. It should be noted that any purchase of development rights as part of this strategy should be strictly voluntary.

Noise mitigation projects that propose acquisition of properties containing incompatible land uses for redevelopment into noise compatible land uses require the acquisition of all, or substantially all, of the property in the project area to accomplish the intended noise mitigation. **Eligible land acquisition should normally be fee simple; however, some lesser interest may be acquired in the form of easements where appropriate.**

The Fifth Amendment of the U.S. Constitution states that “private property shall not be taken without payment of just compensation” and that “no person shall be deprived of life, liberty, or property without due process of the law.”

Though they appear similar, voluntary acquisition programs are **NOT** the same process as eminent domain. In the wake of the U.S. Supreme Court’s Kelo vs. New London decision, state and local governments are taking action to restrict the use of eminent domain for economic development purposes. Acquisition of property for conservation or to protect the Base from encroachment is not an economic development purpose.

Economic Development—The term “economic development” means any activity to increase tax revenue, tax base, employment, or general economic health, when that activity does not result in (1) the transfer of land to public ownership, such as for a road, hospital or military base; (2) the transfer of land to a private entity that is a common carrier, such as a railroad, utility, or toll road; or (3) the transfer of property to a private entity when eminent domain will remove a harmful use of the land, such as the removal of public nuisances, removal of structures that are beyond repair or that are unfit for human habitation or use, or acquisition of abandoned property.

Supreme Court: Kelo vs. New London

7.7.2.b Voluntary Avigation Easement Program

The Voluntary Avigation Easement Program allows for the purchase of easements within the 65 dB DNL or greater noise contours to ensure continued land use compatibility of properties where the municipality has taken other actions to mitigate noise within the 65 dB DNL or greater noise contour. Easements may also be purchased from property owners who choose not to utilize sound attenuation measures. If the property were resold, it would be subject to avigation easements attached to the deed to ensure long term compatibility. Properties containing the avigation easements could be re-developed to a compatible use within the 65 dB DNL or greater noise contours.

7.7.2.c Fee Simple Purchase of Part of Land

When only a small amount of land is being acquired from a larger tract and the remainder is not being materially affected, such as a change in the highest and best use or evidence of diminution of value, only that area being acquired needs to be appraised. Examples of less than full fee interest acquisitions are:

- **Part of whole in fee simple**: Fee simple acquisition of only a part of an owner's property.
- **Clear Zone easement**: An easement that restricts all building, and growth of trees or plants from the level of the ground. The land itself is not acquired. The areas controlled by a Clear Zone Easement must be, and must remain, cleared of any buildings, structures, objects (other than air navigation facilities), growths (vegetation, such as trees), or assemblies of persons. To the extent possible right-of-flight should be included in any easement acquired. Clear Zone Easements alone provide protection from obstruction and do not include right-of-flight and will not protect an airport owner from future claims from property owners due to over flights. For this reason, land acquisition in the CZ is also recommended.
- **Life estates**: (FAA 5100.37a, 2-27; 3-10) a life estate is the right to reside on the property until death even though the property is sold. It is not a recommended method of land acquisition and it is unlikely that the DoD or FAA would approve reimbursement of land purchased with a life estate granted until the life estate has been fully exercised.

Some typical restrictions that may be included in an easement are:

- Right to restrict or prohibit radio or electromagnetic interference. On commercial property, this restriction may affect the highest and best use and value; however, little or no effect should occur to agricultural land.
- Right to restrict or prohibit construction of certain types of buildings or structures. This restriction may severely limit the use of land intended for certain development. On the other hand, the land use zoning ordinance may already have placed restrictions on the physical development, in which case the net effect of the easement restriction may be isolated.

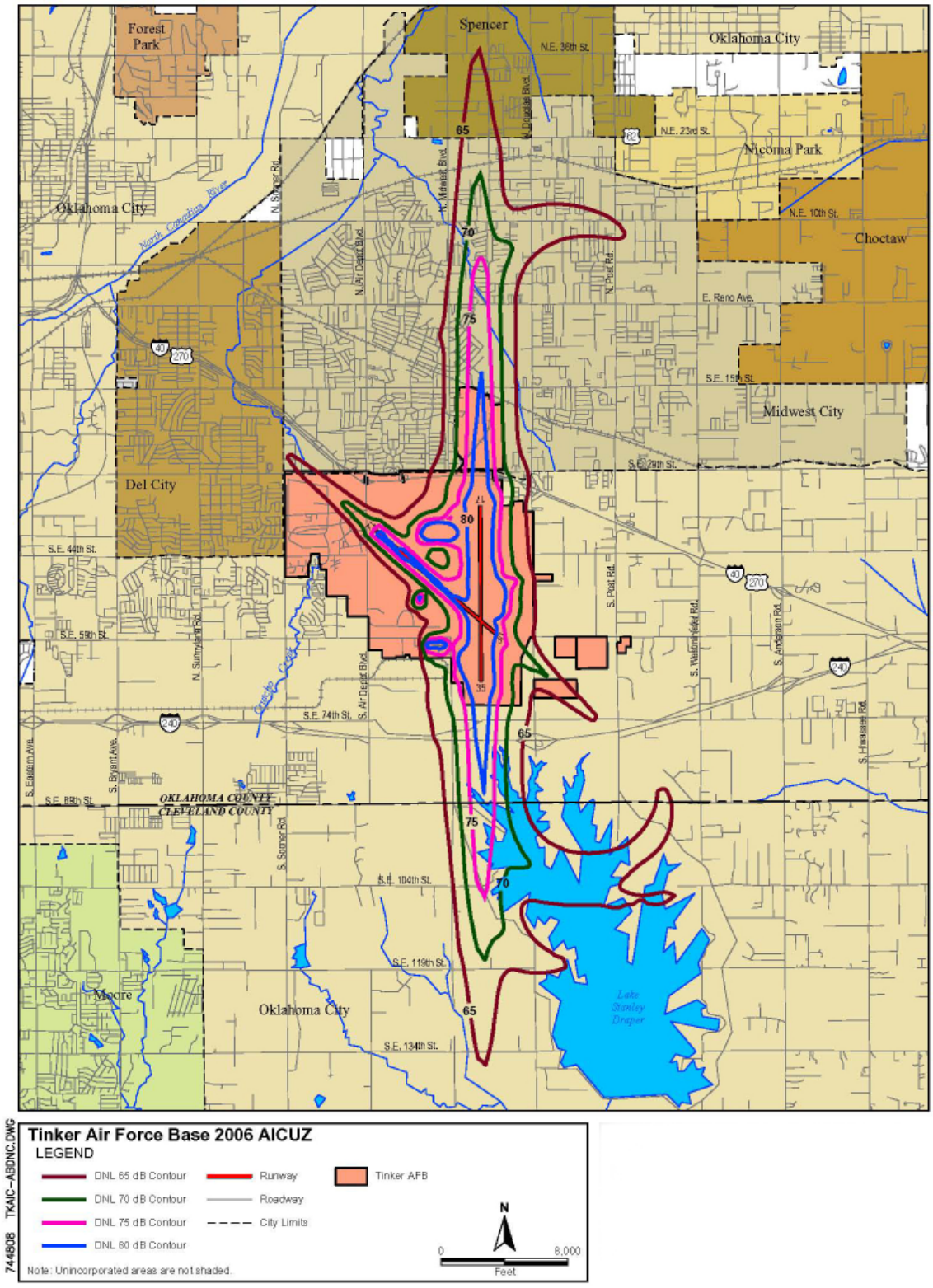
On-going testing
Electronics technician Janae Starkey re-assembles a B-1 antenna after testing in Tinker's B-1 Antenna Shop. The shop is the only one in the Air Force working on the bomber's antenna repair. (Air Force photo by Margo Wright)

- Right to restrict or prohibit lights, lighted signs, and other lighted objects which could distract or temporarily blind pilots
- Right to restrict or prohibit hazardous or unreasonably objectionable smoke, fumes, or vapor
- Right to control the maintenance of any structure, including temporary interference with any of the acquired surfaces
- Right to restrict or prohibit specific agricultural uses such as growth and harvesting of timber, establishment of orchards or other plant growth that may eventually penetrate imaginary surfaces
- Right to restrict or prohibit specific agricultural uses; construction of ponds, lakes or other water impoundment; sanitary landfills or other manmade improvements that may attract or result in the concentration of birds and/or waterfowl

In cases where easement acquisition may prove cumbersome, other means of noise mitigation should be explored. For residences, a provision for sound insulation should be considered, but only where feasible and cost effective and if publicly funded or subsidized, in exchange for an avigation easement to homeowners located within the 65+ dB DNL noise contour of the 2006 AICUZ Noise Exposure Map (See Figure 7.5).

Sound insulation would only be beneficial to those residences where sound insulation can be effectively applied. Sound insulation for manufactured homes, for example, may not be beneficial. This method should also include sound reduction insulation of all schools and institutional/public uses located within the 65 dB DNL or higher. This will reduce the noise impacts on existing non-compatible land uses.

Figure 7.5 2006 Average Busy-Day Noise Contours



Source: 2006 AICUZ Study – Tinker AFB

7.7.3 Transfer of Development Rights

The Transfer of Development Rights (TDR) is a mechanism used to manage location of future development. This action takes place voluntarily. The owner of the constrained land sells the development credits established under zoning to a buyer who then can develop additional density on another property based on the number of credits purchased. The program would be inexpensive or cost-free to the military installation since the local government would administer it. The program could also stimulate growth and appropriate development of the property to which development rights were being transferred while reducing the potential of incompatible development in certain areas.

Transfer of development rights could be utilized to exceed density limits in major urban centers, community retail centers, and mixed use districts, particularly for those parcels that may be split by an APZ I or II boundary or noise contour. Other options could include land swapping government owned properties outside the AICUZ APZs (including the 65+ dB DNL and greater noise contours) with property owners having incompatible land uses inside the AICUZ noise contours. Because noise is an environmental issue, density transfers from “environmentally” constrained lands to on- or off-site buildable lands could also be permitted through a density transfer program.

7.7.4 Land Banking

The term “land banking” is defined as a system in which an entity, public or private, acquires land available for future development for the purpose of implementing a public land use policy. As compared to acquisition for permanent non-development or open space, land banking is a temporary holding status to be conveyed for appropriate development at a future date. Land banking may have an anti-inflationary effect on land prices, thus preventing land speculation, and may permit more rational patterns of development. **Funding for these land banking activities may be public or private and is recommended in APZs and 75+dB DNL areas.**

7.8 AICUZ Disclosure and Real Estate Transactions

No matter what land use designation a property carries—whether it is located within a noise or accident zone—airfield adjacency can have a material impact upon the present and future value of the land. It is essential that present and future owners of real property know not only where the AICUZ accident and noise boundaries are but also understand the implications of being located within those borders.

Disclosure of AICUZ boundaries is becoming a legal requirement in more states as part of real estate sales transactions. This means that when a buyer signs a contract for the purchase of real property, he/she/they must be informed as to whether or not the subject land and/or structure is located within the boundaries of either outlined noise contours or APZs. At that point the purchaser is required to sign a document attesting to the disclosure.

In practice the disclosure process often provides relatively little information to the purchaser because the real estate community may be uninformed about the AICUZ boundaries. Also, anecdotal evidence from purchasers continues to show that in the rush and confusion of signing the many forms involved in a real estate purchase, even well-informed buyers do not remember signing disclosure statements and/or do not understand what “AICUZ Disclosure” may mean to them. As a result, improvements to the process are needed, particularly in the areas of information and education.

7.8.1 Real Estate Disclosure Process

No law or mechanism is currently in place within the real estate transfer process that requires prospective buyers of property located in the 2006 AICUZ Study footprint to be formally notified that they are purchasing property in an area that is susceptible to noise impacts or other aircraft operations. Under Oklahoma Statutes Title 60, §§ 831-839, the state requires sellers of residential property consisting of one or two dwelling units to provide to purchasers either a written property disclaimer statement or written Property Condition Disclosure Statement. The statute also requires the Oklahoma Real Estate Commission to establish by rule a form for the disclosure statement.

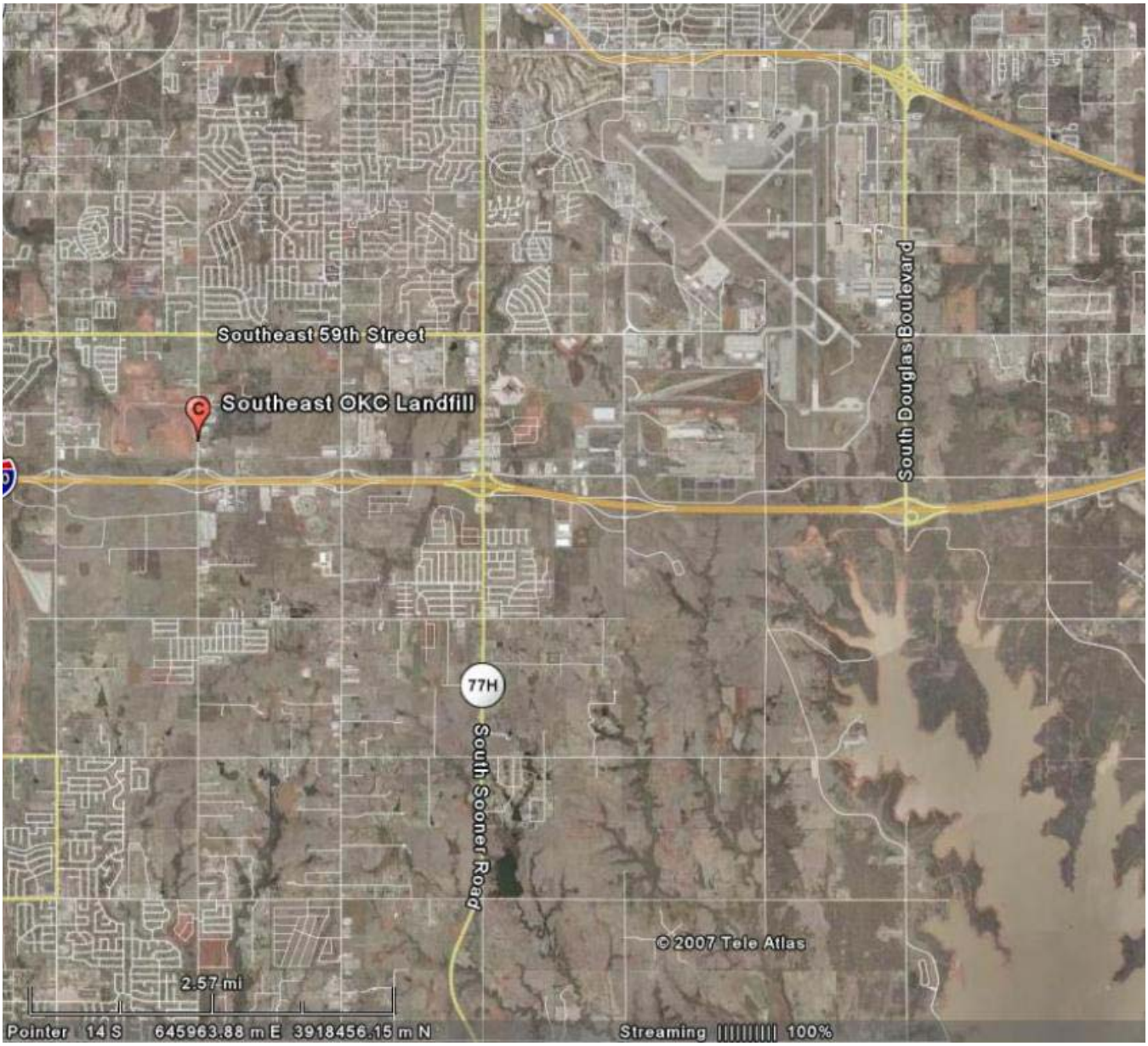
The disclosure statement adopted under the law requires the disclosure of sellers' knowledge of the presence of radon or of the occurrence of radon testing on the property, or any condition on the property that would impair the health or safety of the occupants. It does not specify aircraft noise as an environmental hazard. **Such a notification process should be established in a manner that most appropriately meshes with the county's existing real estate transfer process. However, any such process should involve permanent recording of a document that has been signed by the buyer indicating that such notification has been provided.**

7.9 Bird Management

Active control of bird populations around military installations has been an on-going activity since the mid 1980s. Tinker entered into an aggressive bird aircraft strike hazard (BASH) monitoring program in 1989. However, despite the Base's best efforts, in recent months, several articles have been published on the topic of bird traffic around Tinker AFB. According to one article published in June 2007 on news-star.com, "Military officials at Tinker Air Force Base want wildlife experts to help minimize the number of birds flying near the Base because of concerns that takeoffs and landings are becoming riskier."

Bird strikes during flight and the interaction of terrestrial and avian species with aircraft on the ground is a hazard to aviation. The FAA Advisory Circular (AC) 150/5200-33, Hazardous Wildlife Attractants on or Near Airports, provides guidance on locating certain land uses having the potential to attract hazardous wildlife to or in the vicinity of public-use airports such as sanitary landfills and wetland mitigation areas. Specifically the document identifies land uses of concern in proximity to airports including, wetlands, ponds, storm-water retention facilities, and other similar uses for they offer excellent habitat for avian wildlife. In addition, the location of landfills within the proximity of an airfield is also considered a hazard due to its likelihood to attract flocks of birds. Figure 7.6 shows one landfill within two miles of Tinker AFB.

Figure 7.6 Landfills Within 2 Miles of Tinker AFB



Source: Google Earth

DoD recommends that no new sanitary landfill or wetland mitigation projects should be within 10,000 feet of an active general aviation runway end. Oklahoma County officials have met to decide whether to engage the state's agriculture department to help reduce the number of birds circling the landfill in the southeast sector, but a firm decision has not been made at this writing. **It is strongly recommended that action be taken soon to avoid an aviation disaster.**

7.10 Building Code Recommendations

A building code prescribes the basic requirements that regulate construction of structures. The building code is adopted by the local government in order to protect the health, safety, and general welfare of the occupants of these structures. The code establishes a set of requirements covering matters such as fire protection, building materials, lights, ventilation, exits, plumbing, and other related activities.

Although building codes are not a technique to prevent development, they can require certain types of construction near military installations. A building code could also incorporate the more restrictive DoD sound attenuation recommendations. These recommendations require that walls, partitions, and floor-ceiling construction have minimum sound transmission capabilities to reduce interior noise levels, especially when the construction is located in an area with potential sound impacts. The code could specify a certain sound transmission class (STC) that must be obtained through specific construction techniques and materials. In addition, the code could require that certain noise level reductions are maintained after the structure is complete.

Noise level reduction measures should be included in building codes, with specific recommendations being:

- Referencing noise contour areas on all adopted future land use plan maps and zoning maps
- Requiring all new development in these areas to provide noise attenuation features.
- Requiring, through local building code requirements, sound attenuation for new buildings with the level of sound protection based on noise exposure within noise contours of 65 dB DNL and higher
- Requiring a noise level reduction of at least 25 dB for development located between the 65 and 70 dB DNL noise contours and 30 dB for development located between the 70 and 75 dB DNL noise contours, consistent with Air Force Instruction 32-7063.

Del City and Midwest City currently have provisions in their zoning codes requiring sound attenuation in excess of DoD's recommendations.

Del City's code states,

> *"All new construction located within the AEZ [airport environs zone] shall meet or exceed building code requirements for a minimum noise level reduction of thirty (30) decibels inside the structure, as set forth in Article 26 of the BOCA Building Code as adopted and amended. New construction shall be defined as the erection of any building or structure, or any structural addition to the extent of 50% of either the floor area or true value of the original structure."*

Midwest City's code also meets or exceeds DoD recommendations for noise level reduction.

7.10.1 American National Standards Institute Guidelines

The American National Standards Institute (ANSI) has published guidelines for assessing the compatibility of various types of land uses with different levels of sound exposures. Table 7.1 shows specific land use compatibility with yearly day-night average sound levels at a site for building as commonly constructed (i.e. without special sound barriers). Obtained from 14 ANSI S12.40, it should be viewed as a list of recommended guidelines, as each jurisdiction will have to adopt these guidelines by ordinance to make them enforceable.

In general, housing is compatible with an exterior noise exposure up to 55 db DNL, as indicated on Table 7.1. Standards indicate that with exposure between 65-75 db DNL, additional protective measures, such as indoor noise reduction/isolation for residential and certain other types of indoor uses may be warranted. Noise exposure that exceeds 75 dB DNL is incompatible with all residential uses but many uses, such as manufacturing, retail, government facilities, and agriculture can be suitable even within relatively high noise levels.

The planning of future noise-sensitive land uses should have a sufficient spatial separation or incorporate site design and construction techniques to ensure compatibility with aircraft noise. Noise-sensitive land uses include, but are not necessarily limited to residential, hospitals, nursing facilities, intermediate care facilities, child educational facilities, libraries, museums, places of worship, and child care facilities.

Existing building codes should be modified to reflect sound attenuation measures, in addition to the adoption of height, lighting and obstruction ordinances. At the present time all but one of the JLUS local governments participating in the JLUS utilize the International Building Code (IBC) 2003 (or newer) for all new construction (including additions to existing structures).

Table 7.1 Noise Levels and Land Use Compatibility

Land Use	Yearly Day-Night Average Sound Level (expressed as dB)							
	<55	55-60	60-65	65-70	70-75	75-80	80-85	85+
Residential-Single Family (Extensive Outdoor Use)								
Residential-Single Family (Moderate Outdoor Use)								
Residential - Multistory (Limited Outdoor Use)								
Transient Lodging (Indoor Use)								
School Classrooms, Libraries, Religious Facilities (Indoor Use)								
Auditoriums, Concert Halls (Indoor Use)								
Music Shells (Outdoor Use)								
Sports Arenas, Outdoor Spectator Sports (Outdoor Use)								
Neighborhood Parks (Outdoor Use)								
Playgrounds, Golf Courses, Riding Stables, Water Recreational Areas, Cemeteries (Outdoor Use)								
Office Buildings, Personal Services, Business and Professional (Indoor Use)								
Commercial (Indoor Use)								
Livestock Farming, Animal Breeding (Outdoor Use)								
Agriculture (Except Livestock) (Outdoor Use)								
Extensive Natural Wildlife and Recreation Areas (Outdoor Use)								

Compatible
Marginally Compatible
Compatible with Sound Attenuation
Incompatible

Source: ANSI- S12.40, 1990 Appendix

7.10.2 Development of Construction Guide

It is recommended that local governments use acoustic sound transmission class (STC) ratings rather than other single or multiple-figure ratings, since extensive STC data is readily available to architects and building code officials. The aim is to require a minimum amount of additional effort and cost for builders.

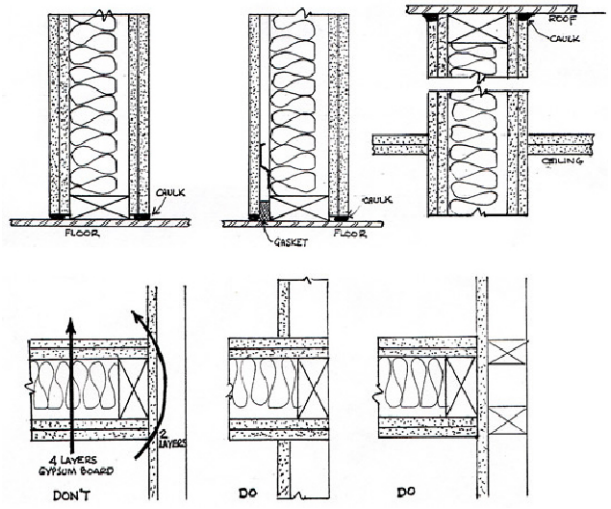
A construction guide should be prepared by the local governments to provide builders, developers, architects and building inspectors with information to help comply with noise compatibility guidelines. The guide should specifically address noise reduction of structures in areas exposed to aircraft noise. The guidelines, along with a noise attenuation ordinance could be used by the local governments in their review of comprehensive plan amendments or development plans and/or subdivision plats. The guide would:

- Provide a better understanding of the issues and problems encountered in complying with noise regulations
- Serve as a designing guide for exterior-to-interior noise attenuation
- Estimate required STC values within certain aircraft noise zones
- Determine whether or not the design of a single-family residence or other habitable structure (apartments, townhouses, hotels, condominiums) complies with noise reduction guidelines
- Provide STC values for a variety of building elements, including walls, roof assemblies, windows and doors

7.10.3 Architectural Design for Noise Reduction

The activities listed below should be incorporated into building design in its earliest phases to minimize exterior-to-interior sound transmission. Most of these principles are also consistent with the Oklahoma Energy Code. Alternate design features may be accommodated but may require a more extensive acoustical evaluation.

- Avoid large areas of glass unless appropriate STC can be provided.
- Use solid-core exterior doors (in combination with storm doors) where possible.
- Use patio (glass) doors sparingly.
- Do not use large wooden frame casement windows that cannot accommodate the weight of heavier glazing.
- Use skylights sparingly (STC rated if possible).



Source: www.acousticalsurfaces.com

- Avoid roof-ceiling structures without insulated attics.
- Specify caulking and sealing off all through-the-wall penetrations.
- Avoid bypassing channels by attaching shelving and appliances directly to studs when using sound channels on interior skin.

It is possible to make existing structures noise compatible by implementing structural improvements including increased insulation, better windows and airtight exterior walls. This can be accomplished by means of changes to and enforcement of the local building codes, where necessary. Additionally, new construction in the 65+ dB DNL could be required to participate in a sound attenuation program; participation for existing buildings would be voluntary. Once a structure complies with the program, certification could be awarded to the property owner and recorded along with all other property ownership records at the County.

Noise attenuation measures may be considered relatively inexpensive for new homebuilders and purchasers. However, for individuals or households with low or moderate incomes the costs to retrofit homes with noise attenuation measures may be prohibitive.

7.10.4 Acoustic Site Design

Acoustic site design refers to the positioning of structures on a development site for the purpose of reducing noise levels in the most noise-sensitive buildings. Structures and natural variations in topography may serve as barriers to shield noise sensitive portions of a site. Even with environmental siting, shielding can best be provided by structures. Buildings containing non-sensitive uses such as parking garages are ideal for shielding. Buildings with uses less sensitive to noise than those being protected are also potential shields. In such cases, the shielding structure will usually require acoustic architectural design and/or construction but it is possible to use retail and business office buildings to shield residential structures.

Although the topography of a site may not offer much opportunity for shielding, properly placed structures can exploit natural site characteristics. Simple, inexpensive ideas such as earth mounds between buildings can further enhance shielding characteristics. Noise reflected off buildings and ground surfaces can be a significant problem, especially in high-rise buildings and exterior spaces. A street bounded by buildings becomes a noise canyon, but increasing building setbacks can help to mitigate this effect.

Setbacks can be effective in acoustical design due to required landscaping, which helps in reducing the impact of noise sources. Hard surfaces, such as parking lots, will reflect noise (and may even amplify it) so they should be sited carefully.

7.11 Closure of a Portion of Douglas Boulevard

Portions of an aircraft maintenance and repair facility, called the Maintenance Repair Overhaul and Technology Center (MROTC), have recently been constructed east of S. Douglas Boulevard and north of SE 59th Street. When completed, the MROTC will be a major military and commercial aircraft facility containing several hangars along with education and training facilities. Industrial land use designation has been expanded to include the area contiguous with the MROTC east of Tinker to Post Road. **As recommended in the Actions of the Public Services and Infrastructure section of Oklahoma City's Southeast Sector plan, a study should be conducted to determine the future feasibility of closing a portion of Douglas**

Boulevard to address future needs for Tinker expansion and security. Such closure would likely be coupled with new interstate access at I-40 and I-240, as well as the widening of SE 44th Street and Post Road to accommodate future travel demand in the area and Tinker access.

7.12 Tinker AFB Recommendations

Just as urban encroachment in surrounding areas can become a sustainability issue for Tinker AFB, change of military mission, equipment, and land use activities at the installations can impact the sustainability and livability of the communities surrounding them. Although local governments have a recognized responsibility for protecting the integrity of the military installation, the military community also bears a responsibility for being a good neighbor. For neighboring communities to make responsible land use planning and growth decisions, it is necessary for the military officials to provide detailed information regarding proposed development plans and future mission changes. Local governments cannot be expected to make well-informed planning decisions without advance knowledge of new military training requirements.

Similarly, local governments surrounding the military complex need assurances that the Air Force will share the responsibility for identifying, preserving, and protecting the natural environment and endangered species within their boundaries.

The Military should apprise the surrounding local governments of new land use and development plans at the Base. Following the adoption of this study, Tinker AFB should develop a local government notification process for any changes in military equipment and/or land use activities, which could have significant off-base impacts.

JLUS Summary of Recommendations

Recommendation	Action	Applicable Areas
Review Flight Path Corridors	Seek Tinker AFB input on public facilities locations, including schools, libraries, etc.	All local governments*
Revise Current Comprehensive Plans and Zoning Requirements	Modify Comprehensive Plans and Zoning ordinances to minimize incompatible land uses in and around the Base, particularly within both of the AICUZ accident potential zones.	Oklahoma City, Del City, Midwest City
Modify Land Use Policies Regarding Zoning Process	Establish land use policies against zoning land to any category permitting residential development within the 75 dB DNL or higher contour, or within the 65-74 dB DNL contour unless sound attenuation will be achieved.	Midwest City, Oklahoma City, Spencer,
Consider Purchase of Land within the APZ I and 75+ dB Noise Contour	Consider as an alternative to regulatory methods for preserving land and minimizing the development of incompatible land uses.	Del City, Midwest City, Oklahoma City
Create Voluntary Acquisition Program	Consider providing a voluntary acquisition program for residential properties and vacant land located within the APZ I areas.	Del City, Midwest City, Oklahoma City
Develop Voluntary Avigation Easement Program	Allow the acquisition of easements to ensure land use compatibility of properties within the 65 dB DNL or greater noise contour.	Spencer, Del City

*Choctaw, Del City, Midwest City, Oklahoma City, Nicoma Park, Spencer, Oklahoma County, and Cleveland County

JLUS Summary of Recommendations (continued)

Recommendation	Action	Applicable Areas
Consider Fee Simple Purchase of a Portion of Land	Allow the purchase of a portion of property to protect open space, sensitive, or critical areas within AICUZ noise contours and accident potential zones.	Del City, Midwest City, Oklahoma City
Establish Transfer of Development Rights Program	Develop a transfer of development rights program to maintain public safety and mission sustainability where development rights currently exist.	All local governments*
Allow Land Banking in APZs and 75+ dB DNL Areas	Allow land to be placed in a temporary holding status to be turned over for compatible development at a future date.	Del City, Midwest City, Oklahoma City
Develop Real Estate Disclosure Process	Implement disclosure process for structures located within AICUZ noise contours and accident potential zones at the initial advertisement of property (e.g., Multiple Listing Service database).	Oklahoma County, Cleveland County
Help Manage Bird Population	Work with the state's agriculture department to help reduce the number of birds circling the landfill in the southeast sector of Oklahoma City.	Oklahoma County, Tinker AFB
Limit Landfills and Protect Wetlands	Prohibit new sanitary landfill or wetland mitigation projects within 10,000 feet of aircraft runways. (Does not include retention or detention ponds.)	Del City, Midwest City, Oklahoma City, Oklahoma County

*Choctaw, Del City, Midwest City, Oklahoma City, Nicoma Park, Spencer, Oklahoma County, and Cleveland County

JLUS Summary of Recommendations (continued)

Recommendation	Action	Applicable Areas
Update Building Codes	Continue to meet or exceed DoD recommendations for noise level reduction. Upgrade building codes to most recent version of the International Building Code.	Midwest City
Revise Ordinances	Ensure height and obstruction ordinances reflect current Air Force and Federal Aviation Administration (FAA) Part 77 requirements.	All local governments**
Develop Construction Guide	Prepare for builders, developers, architects and building inspectors to clarify noise compatibility guidelines.	All local governments**
Modify Architectural Design for Noise Level Reduction	Encourage existing structures and require new construction in the 65+ dB DNL and higher to participate in a sound attenuation program. Once a structure complies with the program, certification should be awarded to the property owner and recorded along with all other property ownership records.	Midwest City, Oklahoma City, Spencer, Oklahoma County
Improve Acoustic Site Design	Encourage positioning of new structures within AICUZ noise contours on a development site for the purpose of reducing noise levels in the most noise-sensitive buildings.	Midwest City, Oklahoma City

**Choctaw, Del City, Midwest City, Oklahoma City, Nicoma Park and Spencer

JLUS Summary of Recommendations (continued)

Recommendation	Action	Applicable Areas
Evaluate Closure of Part of Douglas Boulevard	Determine the feasibility of closing a portion of Douglas Boulevard related to development of the MROTC and future needs for Tinker expansion.	Tinker AFB, Oklahoma City, Midwest City, Oklahoma Department of Transportation, Association of Central Oklahoma Governments
Guard Against Urban Encroachment	Provide detailed information regarding proposed development plans and future mission changes.	Tinker AFB, All local governments***
Adopt Maximum Development Densities	Adopt maximum densities for new development within AICUZ APZ I and II for various land uses.	Del City, Midwest City, Oklahoma City
Adopt Communication Strategy	Develop strategy and protocol for ongoing communication between Tinker AFB and surrounding communities to apprise each other of potential development within AICUZ accident and noise zones.	Tinker AFB, Del City, Midwest City, Oklahoma City, Spencer, Oklahoma County, Cleveland County
Revise Maps	Show APZs I, II and AICUZ noise contours on all adopted Comprehensive Plan maps and/or Zoning maps.	Del City, Midwest City, Oklahoma City, Oklahoma County, Cleveland County

***Del City, Midwest City, Oklahoma City, Oklahoma County, Cleveland County

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SECTION VIII
References and Appendices

Sun sets on AWACS mission
An E-3 Sentry Airborne Warning and Control System sits on the flightline at a forward-deployed location in Southwest Asia. The AWACS mission conducted by the 363rd Expeditionary Airborne Air Control Squadron ended after 13 years.
(Courtesy photo)

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http://cooperativeconservation.gov/library/annualreportdefense.pdf

http://www.rand.org/pubs/monographs/2007/RAND_MG612.pdf

http://www.whitehouse.gov/omb/budget/fy2009/defense.html

American Society of Testing and Materials (pg. VI-19)

International Building Code (IBC) 2006

Midwest City Residential Housing Market Analysis, The University of Oklahoma Center for Business and Economic Development, November 13, 2002

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8.2 Appendices: Table of Contents

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Appendix A Oklahoma Municipal Code Section 43.101.1

Oklahoma Statutes Citationized
Title 11. Cities and Towns
Chapter 1 - Oklahoma Municipal Code
Section 43-101.1 - Municipalities With an AICUZ Study Area, JLUS Area…

A. Any municipality in this state that is wholly or in part within an Air Installation Compatible Use Zone (AICUZ) study area, Joint Land Use Study (JLUS) area, Army Compatible Use Buffer (ACUB), or an Environmental Noise Management Plan (ENMP) of an active duty, National Guard or Reserve military installation may enact a city ordinance restricting or prohibiting future uses for that incorporated area which lies within the AICUZ, JLUS, ACUB, or ENMP area and which may expose residents to noise greater than sixty-five (65) Day-Night Noise Level (DNL) or accident potential that could affect the public health, safety, and welfare, or interfere with military operations, including aircraft operations. Such authority shall not extend into the corporate limits of another municipality.

B. The ordinance shall restrict or prohibit future uses within the AICUZ or JLUS area which:

1. Release into the air any substance which would impair visibility or otherwise interfere with military operations, including ground operations, such as steam, dust or smoke unless the substance is generated from agricultural use;

2. Produce light emissions, either directly, or indirectly or by reflective light, which would interfere with pilot vision, and aerial or ground-based night vision training;

3. Produce electrical emissions which would interfere with military ground and aircraft communications and navigation equipment;

4. Attract birds or waterfowl including, but not limited to, operation of sanitary landfills and maintenance of feeding stations;

5. Provide for structures within ten (10) feet of defined aircraft approach, departure, or transitional surfaces; or one hundred (100) feet beneath a low-level military aircraft training route as provided by the Federal Aviation Administration;

6. Expose persons to noise greater than sixty-five (65) DNL; or

7. Detract from the aesthetic appearance, or otherwise create or promote an unsightly, unsanitary or unhealthy appearance of any entrance into a military installation including, but not limited to, automobile or truck salvage yards, equipment storage sites or solid waste storage or disposal sites.

C. The ordinance shall restrict or prohibit future uses within the AICUZ/JLUS area which violate any Federal Aviation Administration height restriction in Title 14 of the Code of Federal Regulations (14 CFR) part 77, Objects Affecting Navigable Airspace.

D. 1. The ordinance shall be consistent with the most current recommendations or studies made by the United States Air Force installations located at Altus Air Force Base located in Altus, Oklahoma, Tinker Air Force Base located in Oklahoma City, Oklahoma, and Vance Air Force Base located in Enid, Oklahoma, entitled “Air Installation Compatible Use Zone Study” or studies made by the United States Department of the Army installations located at Fort Sill in Lawton, Oklahoma, entitled “Army Compatible Use Buffers” or any similar zoning relating to or surrounding a military installation as adopted by a county, city, or town or any combination of those governmental entities and shall be consistent with the most current recommendations; and

2. Interpretations of such ordinance shall consider the recommendations or studies with a view to protection of the public health, safety, and welfare and maintenance of safe military and aircraft operations, and assure sustainability of installation missions.

E. Subject to the provisions and requirements of paragraph 1 of subsection D of this section, the ordinance shall not prohibit single-family residential use on tracts of one (1) acre or more in area, provided that future construction shall comply with the “Guidelines for the Sound Insulation of Residences Exposed to Aircraft Operations, Wyle Research Report WR 89-7”. Such construction shall be regulated and inspected by the municipality’s existing building permit and inspection ordinances and procedures.

Historical Data

Added by Laws 2001, SB 658, c. 352, § 2, emerg. eff. June 1, 2001; Amended by Laws 2002, HB 2115, c. 41, § 1, emerg. eff. April 11, 2002 (superseded document available); Amended by Laws 2004, HB 2472, c. 335, § 1, eff. November 1, 2004 (superseded document available); Amended by Laws 2006, HB 2412, c. 194, § 1, eff. November 1, 2006 (superseded document available).

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Appendix B Sample Noise Abatement Ordinance

Source: Office of Economic Adjustment's
"Practical Guide to Compatible Civilian Development Near Military Installations."

Definitions:

STC – Sound Transmission Class - used as a measure of a material's ability to reduce sound," and effectively mitigate any adverse noise levels that could impede a person's use of a residential or commercial structure. The higher the STC value, the greater the sound attenuation and presumably the quieter the structure's interior.

SLR – Sound Level Reduction – also interpreted as sound decibel reduction. (A sound level of 0 decibels is approximately the threshold of human hearing and is barely audible under extremely quiet listening conditions. Normal speech has a sound level of approximately 60 decibels. Therefore, all things being equal, if normal speech ceases, the Sound Level would be Reduced by 60.)

(A) Recommended Construction Methods and Materials to Achieve a minimum 25 SLR, Exterior to Interior

(1) Compliance

Compliance with the following standards shall be deemed to meet the requirements of the compatible use noise zones in which an SLR 25 is specified.

(2) General

a. Brick veneer, masonry blocks, or stucco exterior walls shall be grouted or caulked airtight.

b. At the penetration of exterior walls by pipes, ducts, or conduits, the space between the wall and pipes, ducts, or conduits shall be caulked or filled with mortar.

c. Window and/or through-the-wall ventilation units shall not be used.

d. Through-the-wall door mailboxes shall not be used.

(3) Exterior Walls

a. Exterior walls other than as described in this section shall have a laboratory sound transmission class rating of at least STC-39.

b. Masonry walls having a surface weight of at least 25 pounds per square foot do not require a furred (stud) interior wall. At least one surface of concrete block walls shall be plastered or painted with heavy bridging" paint.

c. Stud walls shall be at least 4" in nominal depth and shall be finished on the outside with siding-on-sheathing, stucco, or brick veneer.

1. Interior surface of the exterior walls shall be of gypsum board or plaster at least 1/2" thick, installed on the studs.

2. Continuous composition board, plywood, or gypsum board sheathing at least 1/2" thick shall cover the exterior side of the wall studs behind wood or metal siding. Asphalt or wood shake shingles are acceptable in lieu of siding.

3. Sheathing panels shall be butted tightly and covered on the exterior with overlapping building paper. The top and bottom edges of the sheathing shall be sealed.

4. Insulation material at least 2" thick shall be installed continuously throughout the cavity space behind the exterior sheathing and between wall studs. Insulation shall be glass fiber or mineral wool.

(4) Windows

a. Windows other than as described in this section shall have a laboratory sound transmission class rating of at least STC-28.

b. Glass shall be at least 3/16" thick.

c. All operable windows shall be weather stripped and airtight when closed so as to conform to an air infiltration test not to exceed 0.5 cubic foot per minute per foot of crack length in accordance with ASTM E-283-65-T.

d. Glass of fixed-sash windows shall be sealed in an airtight manner with a non-hardening sealant, or a soft elastomer gasket or glazing tape.

e. The perimeter of window frames shall be sealed airtight to the exterior wall construction with a sealant conforming to one of the following Federal Specifications: TT-S-00227, TT-S-00230, or TT-S-00153.

f. The total area of glass in both windows and doors in sleeping spaces shall not exceed 20% of the floor area.

(5) Doors

a. Doors, other than as described in this section shall have a laboratory sound transmission class rating of at least STC-28.

b. All exterior side-hinged doors shall be solid-core wood or insulated hollow metal at least 1¾“ thick and shall be fully weather stripped.

c. Exterior sliding doors shall be weather stripped with an efficient airtight gasket system with performance as specified in Section 1-4C. The glass in the sliding doors shall be at least 3/16” thick.

d. Glass in doors shall be sealed in an airtight non-hardening sealant or in soft elastomer gasket or glazing tape.

e. The perimeter of door frames shall be sealed airtight to the exterior wall construction as described in Paragraph 1-4E above.

(6) Roofs

a. Combined roof and ceiling construction other than described in this Section and Section 1-7 shall have a laboratory sound transmission class rating of at least STC-39.

b. With an attic or rafter space at least 6” deep, and with a ceiling below, the roof shall consist of closely butted composition board, plywood, or gypsum board sheathing topped by roofing as required.

c. If the underside of the roof is exposed, or if the attic or rafter spacing is less than 6”, the roof construction shall have a surface weight of at least 25 pounds per square foot. Rafters, joists, or other framing may not be included in the surface weight calculation.

d. Window or dome skylights shall have a laboratory sound transmission class rating of at least STC-28.

(7) Ceilings

a. Gypsum board or plaster ceilings at least 1/2" thick shall be provided where required by paragraph 1-6b above. Ceilings shall be substantially airtight, with a minimum number of penetrations.

b. Glass fibers or mineral wool insulation at least 2' thick shall be provided above the ceiling between joists.

(8) Floors

Openings to any crawl spaces below the floor of the lowest occupied rooms shall not exceed 2% of the floor space area of the occupied rooms.

(9) Ventilation

a. A mechanical ventilation system shall be installed that will provide the minimum air circulation and fresh air supply requirements for various uses in occupied rooms without the need to open any windows, doors, or other openings to the exterior.

b. Gravity vent openings in attic shall not exceed code minimum in number and size.

c. If a fan is used for forced ventilation, the attic inlet and discharge openings shall be fitted with sheet metal transfer ducts of at least 20 gauge steel, which shall be lined with 1" thick coated glass fiber, and shall be at least 5 feet long with one 90 bend.

d. All vent ducts connecting the interior space to the outdoors, excepting domestic range exhaust ducts, shall contain at least a 5 ft. length of internal sound absorbing duct lining. Each duct shall be provided with a bend in the duct such that there is no direct line of sight through the duct from the venting cross section to the room-opening cross section.

e. Duct lining shall be coasted glass fiber duct liner at least 1" thick.

f. Domestic range exhaust ducts connecting the interior space to the outdoors shall contain a baffle plate across the exterior termination which allows proper ventilation. The dimensions of the baffle plate should extend at least one diameter beyond the line of sight into the vent duct. The baffle plate shall be of the same material and thickness as the bent duct material.

g. Fireplaces shall be provided with well-fitted dampers.

(B) Recommended Construction Methods and Materials to Achieve a Minimum 30 SLR, Exterior to Interior

(1) Compliance

Compliance with the following standards shall be deemed to meet the requirements of the compatible use noise zones in which an SLR 30 is specified.

(2) General

a. Brick veneer, masonry blocks, or stucco exterior walls shall be constructed airtight. All joints shall be grouted or caulked airtight.

b. At the penetration of exterior walls by pipes, ducts, or conduits, the space between the wall and pipes, ducts, or conduits shall be caulked or filled with mortar.

c. Window and/or through-the-wall ventilation units shall not be used.

d. Operational vented fireplaces shall not be used.

e. All sleeping spaces shall be provided with either a sound-absorbing ceiling or a carpeted floor.

f. Through-the-wall/door mailboxes shall not be used.

(3) Exterior Walls

a. Exterior walls other than as described below shall have a laboratory sound transmission class rating of at least STC-44.

b. Masonry walls having a surface weight of at least 40 pounds per square foot do not require a furred (stud) interior wall. At least one surface of concrete block walls shall be plastered or painted with heavy bridging" paint.

c. Stud walls shall be at least 4" in nominal depth and shall be finished on the outside with siding-on-sheathing, stucco, or brick veneer.

1. Interior surface of the exterior walls shall be of gypsum board or plaster at least 1" thick, installed on the studs. The gypsum board or plaster may be fastened rigidly to the studs if the exterior is brick veneer or stucco. If the exterior is siding-on-sheathing, the interior gypsum board or plaster must be fastened resiliently to the studs.

2. Continuous composition board, plywood, or gypsum board sheathing shall cover the exterior side of the wall studs behind wood or metal siding. The sheathing and facing shall weigh at least 4 pounds per square foot.

3. Sheathing panels shall be butted tightly and covered on the exterior with overlapping building paper. The top and bottom edges of the sheathing shall be sealed.

4. Insulation material at least 2" thick shall be installed continuously throughout the cavity space behind the exterior sheathing and between wall studs. Insulation shall be glass fiber or mineral wool.

(4) Windows

a. Windows other than as described in this section shall have a laboratory sound transmission class rating of at least STC-33.

b. Glass of double-glazed windows shall be at least 1/8" thick. Panes of glass shall be separated by a minimum 3" air space.

c. Double-glazed windows shall employ fixed sash or efficiently weather stripped operable sash. The sash shall be rigid and weather stripped with material that is compressed airtight when the window is closed so as to conform to an infiltration test not to exceed 0.5 cubic foot per minute per foot of crack length in accordance with ASTM-E-283-65-T.

d. Glass of fixed-sash windows shall be sealed in an airtight manner with a non-hardening sealant, or a soft elastomer gasket or glazing tape.

e. The perimeter of window frames shall be sealed airtight to the exterior wall construction with a sealant conforming to one of the following Federal Specifications: TT-S-0027, TT-S-00230, or TT-S-00133.

f. The total area of glass of both windows and exterior doors in sleeping spaces shall not exceed 20% of the floor areas.

(5) Doors

a. Doors, other than as described in this section shall have a laboratory sound transmission class rating of at least STC-33.

b. Double door construction is required for all door openings to the exterior. Openings filled with side-hinged doors shall have one solid-core wood or insulated hollow metal core door at least 1¾ thick separated by an airspace of at least 4" from another door, which can be a storm door. Both doors shall be tightly fitted and weather stripped.

c. The glass of double-glazed sliding doors shall be separated by a minimum 4" airspace. Each sliding frame shall be provided with an efficiently airtight weather stripping material as specified in Paragraph 2-4c above.

d. Glass of all doors shall be at least 3/16" thick. Glass of double sliding doors shall not be equal in thickness.

e. The perimeter of door frames shall be sealed airtight to the exterior wall construction as indicated in Section 8-4E.

f. Glass of doors shall be set and sealed in an airtight non-hardening sealant, or a soft elastomer gasket or glazing tape.

(6) Roofs

a. Combined roof and ceiling construction other than described in this section and Section 2-7 shall have a laboratory sound transmission class rating of at least STC-44.

b. With an attic or rafter space at least 6" deep, and with a ceiling below, the roof shall consist of closely butted composition board, plywood, or gypsum board sheathing topped by roofing as required.

c. If the underside of the roof is exposed, or if the attic or rafter spacing is less than 6', the roof construction shall have a surface weight of at least 40 pounds per square foot. Rafters, joists, or other framing may not be included in the surface weight calculation.

d. Window or dome skylights shall have a laboratory sound transmission class rating of at least STC-33.

(7) Ceilings

a. Gypsum board or plaster ceilings at least 1/2 " thick shall be provided where required by Paragraph 2-6b above. Ceilings shall be substantially airtight with a minimum number of penetrations.

b. Glass fiber or mineral wool insulation at least 2" thick shall be provided above the ceiling between joists.

(8) Floors

The floor of the lowest occupied rooms shall be slab on fill, below grade or over a fully enclosed basement. All door and window openings in the fully enclosed basement shall be tightly fitted.

(9) Ventilation

a. A mechanical ventilation system shall be installed that will provide the minimum air circulation and fresh air supply requirements for various uses in occupied rooms without the need to open any windows, doors, or other openings to the exterior.

b. Gravity vent openings in attic shall not exceed code minimum in number and size. The openings shall be fitted with transfer ducts at least 3 ft. in length containing internal sound absorbing duct lining. Each duct shall have a lined 90 bend in the duct such that there is no direct line of sight from the exterior through the duct into the attic.

c. If a fan is used for forced ventilation, the attic inlet and discharge openings shall be fitted with sheet metal transfer ducts of at least 20 gauge steel which shall be lined with 1" thick coated glass fiber, and shall be at least 5 ft. long with one 90 bend.

d. All vent ducts connecting the interior space to the outdoors excepting domestic range exhaust ducts, shall contain at least a 10 ft. length of internal sound absorbing duct lining. Each duct shall be provided with a lined 90 bend in the duct such that there is not direct line of sight through the duct from the venting cross section to the room opening cross section.

e. Duct lining shall be coated glass fiber duct line at least 1" thick.

f. Domestic range exhaust ducts connecting the interior space to the outdoors shall contain a baffle plate across the exterior termination which allows proper ventilation. The dimensions of the baffle plate should extend at least one diameter beyond the line of sight into the vent duct. The baffle plate shall be of the same material and thickness as the vent duct material.

g. Building heating units with flues or combustion air vents shall be located in a closet or room closed off from the occupied space by doors.

h. Doors between occupied space and mechanical equipment areas shall be solid core wood or 20 gauge steel hollow metal at least 1¾ thick and shall be fully weather stripped.

General References

Books:

Acoustical and Thermal Performance of Exterior Residential Walls. Doors and Windows; NBS Building Science Series 77, U.S. Department of Commerce/National Bureau of Standards, 1975.

Acoustics Noise and Buildings; Parkin, Humphreys and Cowell; Faber and Faber; London; 1979.

Airborne Sound Transmission Loss, Characteristics of Wood Frame Construction; Fred F. Rudder, Jr.; USDA, Forest Service; General Technical Report FPL-43.

Handbook of Architectural Acoustics and Noise Control; Michael Retting; Tab Book; Blue Ridge Summit, Pa.; 1979.

Quieting: A Practical Guide to Noise Controls; U.S. Department of Commerce/National Bureau of Standards; NBS Handbook 119; 1976.

Institutions and Organizations:

Amerada Architectural Glass.

DeSco Windows.

Georgia-Pacific.

Industrial Acoustics Company.

National Concrete Masonry Association.

Office of Noise Control; California Department of Health Services.

Overly Manufacturing Company.

Paella Products.

Portland Cement Association.

U.S. Gypsum Company.

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Appendix C Sample Memorandum of Understanding

Source: Office of Economic Adjustment's "Practical Guide to Compatible Civilian Development Near Military Installations."

This Memorandum of Understanding between Tinker AFB, 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 Tinker AFB.

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

1. Submit information to the Base Community Planner at Tinker AFB 72nd Air Base Wing on plans, programs, actions, and projects that may affect Tinker AFB. This may include, but not be limited to the following:

- Development proposals
- Transportation improvements and plans
- Sanitary waste facilities
- Open space and recreation
- Public works projects
- Land use plans and ordinances
- Rezonings and variance
- Subdivisions and lot splits

2. Submit to the Base Community Planner at Tinker AFB 72nd Air Base Wing for review and comment, project notification, policies, plans, reports, studies and similar information on development, infrastructure and environmental activities within proximity of Tinker AFB as defined by _____.

3. Consider Tinker AFB comments in local responses or reports. Include the Base Community Planner at Tinker AFB 72nd Air Base Wing 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

Tinker AFB agrees to:

1. Submit information to City and County planning and development staff 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
- Updated Air Installation Compatible Use Zone Study
- Noise Management Studies
- Changes in existing installation use that may change off-post impacts, such as noise
- Appropriate data on troop strength and activities for local plans, programs and projects

2. Submit to City and County planning and development staff for review and comment, project notification, policies, plans, reports, studies and similar information on development, infrastructure and environmental activities at Tinker AFB.

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 USAF, the Cities of _____, the Counties of _____ to violate existing or future laws or regulations.

This agreement is approved by:

County _____
Authorized Representative

City _____
Authorized Representative

Tinker AFB _____
Authorized Representative

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Appendix D Del City's Interim Regulations

Preface

There can be no doubt that Tinker Air Force Base, with employment totaling nearly 19,000 civilian, 11,000 defense contract, and 8,000 active duty military employees, serves as the primary economic engine for Central Oklahoma. As a community directly adjacent to Tinker, the City of Del City has an obligation to help foster the airbase's growth and development. In part, this obligation includes protecting the area around Tinker from encroachments caused by incompatible land uses.

In an attempt to fulfill this obligation, the City of Del City has enacted protective zoning restrictions designed to prevent encroachment by incompatible development. In fact, Del City is the only community in the area to have enacted regulations that were fully compliant with Department of Defense recommendations regarding restriction of incompatible land use near the base runways. Each time the Department of Defense publishes revisions to its recommended development restrictions, known as an Air Installation Compatible Use Zone (AICUZ) Study, the City takes necessary action to ensure compliance with these revised recommendations.

At the request of the Department of Defense, and following the publication of an AICUZ study, Del City has joined with other area communities, the Association of Central Oklahoma Governments, Tinker AFB, and a nationally-recognized consulting firm in a Joint Land Use Study (JLUS). The purpose of the JLUS is to review all aspects of development surrounding the base and make recommendations about how best to regulate development in order to preserve, protect, and foster Tinker AFB, especially with regard to Tinker's positioning during future rounds of Base Realignment and Closing (BRAC) discussions. Of particular importance to the JLUS is the Department of Defense decision to extend its recommended development restriction to two large areas of land at the end of Tinker's cross-wind runway. These land areas are known as Accident Potential Zone II (APZ II) and carry recommendations for strict development controls. The decision to add these additional restricted areas has significant implications for Del City, given the location of the newly added land area (northwest of the cross-wind runway).

A final report from the JLUS process is not expected until mid-2008. In the interim, the City is faced with the task of finding a way to regulate development within this APZ II zone in a way that will support, preserve, and protect the ability of Tinker AFB to carry out its critical missions.

The interim development restrictions contained within this document represent the City's best effort to regulate development within the APZ II zone of the crosswind runway (Runway 12) in such a manner as to restrict the establishment and growth of uses and structures that could create a negative encroachment on Tinker AFB.

Previous AICUZ studies have identified APZ II zones for Tinker's main (north-south) runway. These zones are located within the cities of Midwest City and Oklahoma City. Neither city has adopted or implemented the Department of Defense's development restrictions for these APZ II zones. As such, there is little historical precedent available to Del City to aid in the creation of these interim regulations. Nevertheless, the protection of Tinker AFB from encroachments that could compromise its ability to carryout critical missions, and that could create a negative for Tinker during future BRAC discussions, must be considered to be of paramount importance.

It is never easy to implement land use restrictions that could negatively impact the private property rights of citizens and could hinder the ability of the City to continue to attract development and grow its tax base. These regulations allow for the best and highest land uses that are compliant with the Department of Defense recommendations. Some uses, especially large-scale, high-density assemblies, simply cannot be permitted. Other uses can be carefully designed to be compliant, especially if population densities can be lowered, through the use of planned unit developments, restrictive covenants, and other creative regulatory methods. It is important to note that, consistent with Department of Defense regulations, existing land uses are allowed to continue as nonconforming uses, provided that they adhere to certain basic guidelines. The City is strongly committed to working with property owners to achieve the best and highest uses of their land, and is willing to consider alterations to currently effective zoning and other land use restrictions to allow for compatible uses within the areas affected by the APZ II regulations.

There should be no doubt that these regulations represent Del City's strong commitment to the future security and success of Tinker Air Force Base. The future of this community is inextricably linked to the future of Tinker, and the issue of controlling encroachment and regulating incompatible land use must be afforded the highest priority. As noted above, Del City is the only area community to have fully adopted the previous Department of Defense recommendations for land use regulations. With this document, Del City will be the first area community to adopt regulations for compatible land use within the APZ II zone. While it would be imprudent to adopt final regulations before the conclusion of the JLUS, these interim regulations will allow the City to take appropriate action to control incompatible development during the study period.

Part I: Introduction

This document is intended to provide interim regulations for development within the APZ II zone of the cross-wind runway (Runway 12) for Tinker Air Force Base. These regulations are largely drawn from the Department of Defense recommendations found within the Air Installation Compatible Use Zone Study for Tinker AFB, published in December 2006. Recommendations for final regulations for the entire area surrounding Tinker AFB will be made as part of the Tinker AFB Joint Land Use Study, which is scheduled to be completed in mid-2008. It should be noted that, with regard to the current Del City Airport Overlay Zoning Ordinance, the APZ II zone identified by the 2006 AICUZ Study Report remains a "Proposed APZ II zone" until such a time as the Airport Overlay Zoning Ordinance is amended or superseded by appropriate City action.

A. Description of Impacted Area

The area impacted by these regulations is the area delineated as the APZ II zone for Runway 12, Tinker Air Force Base, by the December 2006 AICUZ Study. This rectangular area is 7000 feet in length and 3000 feet in width and is oriented around the centerline of Runway 12, beginning at a point 8000 feet from the end of the runway (directly beyond the end of the APZ I zone). Plotted on a map (Figure 4.5, Appendix C), this zone is shown to encompass large portions of the heart of Del City, including residential neighborhoods, some commercial structures, and several schools (Del City High School, Kerr Jr. High School, Del City Elementary).

B. Description of Current Airport Overlay Zoning and Related Regulations

Current Del City zoning restrictions related to Tinker Air Force Base are found in Ordinance 1290, adopted on October 3, 2005 (Appendix D). This ordinance provides development restrictions for the APZ 1 zone for Runway 12, as shown in previous AICUZ studies, and also provides guidelines for airfield obstructions (height restrictions) and noise encroachments (sound attenuation regulations). The regulations contained in this ordinance were fully compliant with Department of Defense recommendations at the time of its adoption.

Other related restrictions, largely pertaining to construction standards for sound attenuation, are found in the City's adopted building codes (2003 International Building Code, as adopted; 2003 International Residential Code, as adopted).

City code requires site plan and drainage plan review for some development projects. During such a review, the impact of a given project on Tinker AFB can be considered. This is especially true in the case of drainage plans including detention areas that might serve as an attractant to wildlife, which must be minimized in the areas surrounding the Runway 12 flight path. Property maintenance and sanitation codes also serve to minimize the attraction of incompatible wildlife.

City floodplain management regulations require that any development within the Special Flood Hazard Area be properly permitted. Through the permitting process, projects with the potential to cause backwater impacts (particularly relevant because of the effects that backwater impacts on Crutcho Creek would have on Tinker AFB) are avoided.

C. Discussion of 2006 Air Installation Compatible Use Zone Study for Tinker Air Force Base

In December of 2006, the Department of Defense published the Air Installation Compatible Use Zone (AICUZ) Study for Tinker Air Force Base (Appendix C). This study contained two significant updates to the previous AICUZ studies: revised noise contours based on updated approach/departure flight track information, and the placement of Accident Potential Zone II (APZ II) designations on areas of land at the end of the cross-wind runway (Runway 12/30).

The revised noise contours are of only minor significance to Del City. The new data and modeling caused the boundary of the lowest mapped contour (65dB DNL) to shrink significantly from the previous effective noise map (Figure D-1, Appendix C), which was set forth in the 1983

AICUZ Study. The 2006 noise map (Figure 4.2, Appendix C) has no contours within the Del City city limits. This modification is of little consequence, because Del City's adopted Building Codes provide for construction standards more than exceeding any requirements for sound attenuation that would have been required.

The addition of the APZ II zone on Runway 12/30 is of great significance to Del City. This addition was made at the explicit request of Air Force Materiel Command Headquarters, after the AICUZ report was initially submitted without APZ II zones on Runway 12/30 (Appendix E to AICUZ Report, Appendix C).

With the designation of these zones comes the Department of Defense recommendations related to development restrictions associated with land use compatibility. While the AICUZ study itself states that "accident potential zone II is less critical than APZ I" and that "there would be little benefit of showing APZ II for the (crosswind) runway", the designation has been applied by the Department of Defense and must be addressed by the local communities (4-14, Appendix C).

D. Discussion of Tinker AFB Joint Land Use Study

During the 2006 AICUZ process, Tinker Air Force Base was nominated by the Secretary of the Air Force to participate in a Joint Land Use Study (JLUS). The JLUS program, administered by the Department of Defense's Office of Economic Adjustment, allows local communities to partner with air installations in order to develop plans to mitigate encroachments surrounding the base. The City of Del City has adopted a resolution of support for the JLUS process and has nominated representatives to the JLUS Policy Committee and Technical Workgroup.

The JLUS study is a work in progress and is expected to be completed during the Spring of 2008. At this time, there has been no formal request by the Department of Defense to modify local ordinances related to airport zoning in order to reflect the 2006 AICUZ study. It is anticipated that some sort of formal zoning action will be recommended as part of the JLUS Final Report.

Part II: Interim Regulations for Development within Runway 12 APZ II

Given that the JLUS process will not conclude for several months, and that local communities are not being asked to take formal zoning action in response to the 2006 AICUZ study until after the conclusion of the JLUS, a situation exists whereby detrimental encroachments could be permitted in the areas newly designated as Noise Zones and Accident Potential Zones. In order to mitigate the impact of any such encroachments, the following interim regulations for development within the Runway 12 APZ II zone have been created.

These regulations address four specific types of encroachment that could jeopardize the ability of Tinker Air Force Base to carry out its missions. Three of these areas are addressed in Section 4.6.3.1 of the 2006 AICUZ Study Report: height limitations, noise zones, and accident potential zones. A fourth area of regulation relates to other items contained in Section 4.3 of the AICUZ Study Report.

A. Interim Regulations Related to Airfield Obstructions (Height Regulations)

Regulations related to obstructions to air navigation for civil and military airports are found in Federal Aviation Regulation (FAR) Part 77, *Objections Affecting Navigable Airspace*. These regulations were summarized in past AICUZ documents and are incorporated into the City of Del City's current Airport Overlay Zoning. It is critical that these regulations, largely related to height of temporary and permanent structures, be applied to the land within the Runway 12 APZ II zone.

As such, the following interim regulations are promulgated:

• In all areas located within the APZ II zone for Runway 12, Tinker Air Force Base, all development shall comply with the height regulations set forth in Federal Aviation Regulation Part 77, *Objections Affecting Navigable Airspace*. In particular, such development must adhere to the restrictions associated with runway imaginary surfaces, to include the Primary Surface, Clear Zone Surface, Approach-Departure Clearance Surface, Inner Horizontal Surface, Conical Surface, Outer Horizontal Surface, and Transitional Surface as defined within FAR Part 77 and in Section 4.2.2 of the 2006 AICUZ Study Report.

• In addition to the restrictions and notice requirements contained in FAR Part 77 and the 2006 AICUZ Study Report, no structure shall be constructed within the APZ II zone for Runway 12, Tinker Air Force Base, such that an imaginary surface defined as a plane beginning at the termination of Runway 12, having a width of three thousand (3000) feet and a length of 15,000 feet and a slope of one hundred and twenty five feet in length to every one foot in height, is violated.

• In all areas located within the APZ II zone for Runway 12, Tinker Air Force Base, no development shall occur within 10 feet of the Approach-Departure Surface or the Transitional Surface, pursuant to Section 4.3 of the 2006 AICUZ Study Report.

B. Interim Regulations Related to Noise Exposures (Noise Regulations)

Noise exposures for areas surrounding Tinker Air Force Base are delineated by noise contours shown in Figure 4.2 of the 2006 AICUZ Study Report. These exposures are calculated using standard methodology to determine average day night noise levels. It is important to note that none of these noise contours directly affect land within the City of Del City.

Noise contours are subject to change based on changes to flight patterns and operational schedules, as evidenced by the differences between the 2006 Noise Contours and the 1998 Noise Contours shown in Figure 4.3 of the 2006 AICUZ Study Report. In order to protect the potential of Tinker Air Force Base to maintain flexibility needed to fulfill existing obligations and potentially gain new missions, it is prudent to enact sound attenuation regulations even if not strictly recommended by the AICUZ Study Report.

As such, the following interim regulations are promulgated:

• In all areas located within the APZ II zone for Runway 12, Tinker Air Force Base, all new structures shall comply with the energy conservation provisions of the 2003 International Building Code, as amended and adopted by Del City Ordinance 1301, for the purpose of providing sound attenuation.

• In all areas located with the APZ II zone for Runway 12, Tinker Air Force Base, all existing structures that are remodeled, renovated, or otherwise altered such that the cost of alterations exceeds fifty percent (50%) of the value of the structure, shall comply with the energy conservation provisions of the 2003 International Building Code, as amended and adopted by Del City Ordinance 1301, for the purpose of providing sound attenuation.

C. Interim Regulations Related to Accident Potential

As was stated in the 2006 AICUZ Study Report, the potential for accident in the APZ II zones of Runway 12/30 is quite limited. The zone has been included, however, to comply with Air Force policy (see Letter from Air Force Materiel Command, 2006 AICUZ Study Report). Regardless of the decreased risk, the need to protect Tinker Air Force Base from development considered by the Department of Defense to be a detrimental encroachment is paramount. As such, land use regulations consistent with the recommendations of the 2006 AICUZ Study Report must be enacted for the Runway 12 APZ II zone.

The AICUZ Study Report contains a table of Land-Use Compatibility Guidelines (Table 4.3). These guidelines are suggestions based on model zoning code unit use classifications that are somewhat different from the unit use classifications found within the Del City Planning and Zoning Ordinance. Additionally, the table provides for an interpretation of the general Land-Use Compatibility guidelines that is more proscriptive than what is necessary to ensure that encroachments are minimized.

It is important to note that the rights of property owners to enjoy the highest and best use of their property cannot simply be ignored. As such, it is incumbent on the City to craft regulations that are fair to property owners yet that are comprehensive enough to meet the needs, present and future, of Tinker Air Force Base. This is especially true in the APZ II zones, which are of significantly lower risk than Clear Zone and Accident Potential Zone I. In order to achieve that sort of balance, it is necessary to craft regulations that are based on the rationale underlying the AICUZ recommendations.

The primary focus of the APZ II recommendations contained within the AICUZ Study Report is minimizing density. In Section 4.6.2 of the AICUZ Study Report, the following recommendation is made: “high people densities should be limited to the maximum extent possible in APZ II… lot coverage should not exceed 20 percent.” This recommendation also states that single story buildings are preferred.

As such, the following interim regulations are promulgated:

• In all areas located with the APZ II zone for Runway 12, Tinker Air Force Base, new residential structures are prohibited unless constructed as part of a planned unit development that restricts total building density (enclosed area) to below twenty percent (20%) of the entire land area of the development. Multistory residential structures are not permitted.

• In all areas located with the APZ II zone for Runway 12, Tinker Air Force Base, new commercial structures are prohibited unless constructed as part of a planned unit development that restricts total building density (enclosed area) to below twenty percent (20%) of the entire land area of the development. In the case of new multistory structures, building density may not exceed fifteen percent (15%). In either case, lot coverage should be calculated against the total area of the development.

Certain uses, regardless of density, present an encroachment that cannot be adequately mitigated. These uses include assembly uses, uses involving persons not able to respond to emergencies and uses involving storage of hazardous materials.

As such, the following interim regulations are promulgated:

• In all areas located within the APZ II zone for Runway 12, Tinker Air Force Base, assembly uses are prohibited. Specifically prohibited are churches, theaters, auditoriums, gaming facilities, and athletic facilities designed for spectator entertainment.

• In all areas located within the APZ II zone for Runway 12, Tinker Air Force Base, uses that create concentrations of people unable to respond to emergencies are prohibited. Specifically prohibited are schools, child-care centers, adult day-care centers, hospitals, medical clinics, tattooing/body piercing establishments, hospices, and nursing homes.

• In all areas located within the APZ II zone for Runway 12, Tinker Air Force Base, uses that involve storage of hazardous materials are prohibited. Specifically prohibited are hazardous industry, fueling stations, fuel or chemical storage tanks, and salvage yards.

D. Interim Regulations Related to Other Air Installation Encroachments

Section 4.3 of the AICUZ Study Report outlines five general classes of uses that should not be allowed within an Accident Potential Zone. Though these five classifications are not particularly applied to the Runway 12 APZ II, it appears prudent to enact interim regulations protecting against these particularly problematic use classes.

- In all areas located within the APZ II zone for Runway 12, Tinker Air Force Base, new uses that could cause a release of steam, dust, smoke, or any other substance that could impair visibility or otherwise interfere with the operation of aircraft are prohibited. Normal discharges of steam or smoke associated with heating and cooling or preparation of food are excluded from this prohibition.

- In all areas located within the APZ II zone for Runway 12, Tinker Air Force Base, new uses that could cause light emissions, such as spotlights or laser projections, that could interfere with pilot vision are prohibited.

- In all areas located within the APZ II zone for Runway 12, Tinker Air Force Base, new uses that could cause electrical emissions, such as transmission towers or broadcasting facilities, that could interfere with aircraft communication systems or navigational equipment are prohibited.

- In all areas located within the APZ II zone for Runway 12, Tinker Air Force Base, new uses that could attract wildlife capable of creating a hazard to navigation, such as landfills or food processing facilities, are not permitted. Additionally, stormwater conveyance, detention, and retention facilities (including created wetlands), located within the APZ II zone for Runway 12, Tinker Air Force Base, should be designed so as to minimize the attraction of hazardous wildlife, and when possible should conform to the advisory guidance provided for in Federal Aviation Advisory Circular AC 150/5200-33B: Hazardous Wildlife Attractants on or Near Airports.

Part III: Implementation of Interim Regulations

These interim regulations, once endorsed by the Del City Planning Commission and Del City Council, will form the basis of the City's regulation of development within the APZ II zone until such time as formal zoning action is taken (following the conclusion of the JLUS process). These regulations are advisory in nature and do not carry the force of law. Should a development proposal, zoning change, or building permit application be submitted that does not comply with these interim regulations, consideration of that issue will be deferred (to the extent allowed by law or ordinance) until such a time at which permanent zoning regulations have been enacted, or six (6) months following the completion of the JLUS final report, which ever occurs first.

These interim regulations shall apply only to property located within the APZ II zone for Runway 12, Tinker Air Force Base. Under no circumstances should these interim regulations be seen as lessening any requirement currently contained within the Del City Code of Ordinances, Del City Planning and Zoning Ordinance, Del City Airport Overlay Zoning Ordinance, or any of the City's adopted codes.

Except where indicated or where required by state or federal law (in the case of height requirements), these interim regulations shall not apply to existing structures. This exemption is the intent of the Department of Defense, as expressed in Section 4.6.2 of the 2006 AICUZ Study Report and in the letter regarding the AICUZ Study Report authored by Air Force Materiel Commend and attached to the report. This exemption shall also apply to existing land uses not yet developed or redeveloped that are shown in Figure 5.2 of the 2006 AICUZ Study Report. In the case of structures and uses that are exempt, all possible care should be taken to ensure the highest level of compliance with these regulations that is possible given the confines of preexisting status. Standard concepts related to termination of legally nonconforming uses will be applied as set forth in the Del City Planning and Zoning Ordinance, provided that nothing found within these interim regulations will serve to further the termination of a nonconforming use for those uses that are residential or educational (limited to schools, not to include child care centers or facilities for religious education) in nature.

Part IV: Conclusion

Section 6.3 of the 2006 AICUZ Study Report outlines seven responsibilities of local communities with regard to the continuing cooperative effort to ensure the long-term viability of Tinker Air Force Base. The City of Del City, through its past actions, participation in the JLUS process, and issuance of these interim regulations, has embraced these responsibilities for the good of the entire region.

Responsibility 1: Continue to incorporate AICUZ policies and guidelines into the comprehensive plans of Oklahoma County and the cities of Oklahoma City, Midwest City, and Del City.

The City of Del City is in the process of updating its comprehensive plan. This plan update was temporarily halted so that the new plan could incorporate the results of the JLUS study.

Responsibility 2: Modify existing zoning ordinances and subdivision regulations to support the compatible land uses outlined in this study.

The City of Del City has always taken a proactive approach to AICUZ guidelines. Del City is the only city in the region to have fully adopted the 1998 AICUZ guidelines. Del City is the only city in the region to have developed interim regulations for implementation of the 2006 AICUZ guidelines, pending the completion of the Tinker AFB Joint Land Use Study.

Responsibility 3: Modify building codes to ensure new construction within the AICUZ area has the recommended noise level reductions incorporated into its design and constructions.

The City of Del City has adopted the 2003 International Code Series, including energy conservation provisions that provide for sound attenuation greater than what is required by the AICUZ guidelines. These interim regulations also stress sound attenuation within the APZ II zone.

Responsibility 4: Implement height and obstruction ordinances which reflect current Air Force and FAR Part 77 requirements.

The City of Del City implemented height requirements as part of previous AICUZ guidelines. These interim regulations further apply the FAR Part 77 requirements to area within the APZ II zone.

Responsibility 5: Keep the DoD Office of Economic Adjustment apprised of any development near Tinker AFB that may impact the program for Joint Land Use Studies.

The City of Del City currently advises Tinker AFB of any construction permits or zoning actions that affect land within the APZ I zone. This notification will be expanded to include new construction within the APZ II zone.

Responsibility 6: Continue to inform Tinker AFB of planning and zoning actions that have the potential of affecting Base operations.

The City of Del City currently advises Tinker AFB of any construction permits or zoning actions that affect land within the APZ I zone. This notification will be expanded to include new construction within the APZ II zone.

Responsibility 7: Support the Joint Land Use Study Program for Tinker AFB to protect the area from encroachment.

The City of Del City is a strong supporter and participant in the JLUS study process.

These interim regulations represent the City of Del City's support of Tinker Air Force Base and its commitment to decreasing encroachments that could negatively impact the ability to carry out current and future missions. As seen above, the City has long been committed to preserving, protecting, and nurturing Tinker Air Force Base. As the Joint Land Use Study progresses, it may become apparent that these interim regulations need to be modified or altered to better mitigate the impact of current and future encroachments. Until the JLUS process is complete, there is a real need for interim regulations, and this document attempts to fill that need in a way that is responsive to the AICUZ Study Report guidelines.

RESOLUTION NO. 11-19-07A

A **RESOLUTION ENDORSING IMPLEMENTATION OF INTERIM DEVELOPMENT REGULATIONS FOR PARCELS LOCATED WITHIN THE PROPOSED ACCIDENT POTENTIAL ZONE** II **(APZ II) OF RUNWAY 12, TINKER AIR FORCE BASE** .

WHEREAS, it is recognized that the continued operation of Tinker Air Force Base (Tinker AFB) is important to national defense and to the economies of the State of Oklahoma, the Central Oklahoma region, and the City of Del City; and

WHEREAS, it is agreed that the current and future missions and operations of Tinker AFB should be preserved and protected; and

WHEREAS, the City of Del City , in partnership with local jurisdictions and Tinker AFB, is currently engaged in a cooperative planning effort, known as a Joint Land Use Study (JLUS), to guide future community growth and development that is compatible with the missions of Tinker AFB; and

WHEREAS, the United States Department of Defense has promulgated a document known as the 2006 Air Installation Compatible Use Zone (AICUZ) Study Report containing recommendations regarding compatible land uses within areas surrounding Tinker Air F orce Base; and

WHEREAS, the implementation of zoning regulations pursuant to this updated AICUZ study report is currently deferred, pending the conclusion of the Joint Land Use Study; and

WHEREAS, interim development regulations are necessary to mitigate the potential negative effects of development in the AICUZ study area that may be established before the conclusion of the Joint Land Use Study; and

WHEREAS, a certain document known as *Interim Development Regulations for Parcels Located within the Proposed Accident Potential Zone II (APZ II) of Runway* 12, *Tinker Air Force Base,* three copies of which are on file at the office of the City Clerk, has been developed to serve as guidance for the issuance of permits, adjudication of zoning applications, and any other administrative action related to proposed or ongoing development within the Accident Potential Zone II for Tinker Air Force Base Runway 12 as delineated by the 2006 AICUZ Study Report; and

NOW, THEREFORE, BE IT RESOLVED that the City of Del City expresses support for and hereby endorses the *Interim Development Regulations for Parcels Located within the Proposed Accident Potential Zone II (APZ II) of Runway* 12, *Tinker Air Force Base.*

PASSED and APPROVED, this 19th day of NOVEMBER, 2007.

Brian E. Linley
MAYOR

ATTEST:

Carol Noble
Carol Noble, City Clerk

Approved as to form this 19 of Nov., 2007.

Jack B. Fried, City Attorney

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Appendix E Tinker AFB – 2005 BRAC Decisions

Tinker Air Force Base -- Gain

Manpower: The installation will lose 9 military and 197 civilians and gain 9 military and 552 civilians for a total gain of no military and 355 civilians.

-- Air Force Recommendations:

Receive 4 KC-135R aircraft from Portland IAP, Ore. Move the Global Air Traffic Operations Program Office to Will Rogers AGS, Okla. ANG will associate on AFRC KC-135 aircraft.

--Joint Recommendations:

Regionalize Wholesale Storage and Distribution/ Consolidation of S and S functions at Industrial installations.

Transfer Service ICPs to DLA and consolidate.

Privatize Supply, Storage and Distribution on specific commodities.

Establish Joint Centers for Fixed Wing Air Platform R, D and A, and T and E.

Consolidate Civilian Personnel Office to Randolph Air Force Base, Texas.

Incoming Activities:

-- Air Force Actions:

What: Receive 4 KC-135R aircraft Portland IAP, Ore.

Why: Tinker AFB will robust unit size to increase unit capability and is consistent with Air Force plans to increase overall operational effectiveness across the KC-135 fleet.

-- Joint Actions:

What: Regionalizes Wholesale Storage and Distribution/Consolidation of S and S functions at Industrial installations.

Why: This recommendation reconfigures the Department's wholesale storage and distribution infrastructure to improve support to the future force, whether home-based or deployed. It transforms existing logistics processes by creating four CONUS support regions, with each having one Strategic Distribution Platform and multiple Forward Distribution Points.

Departing Activities:

-- Air Force Actions:

What: Move the GATOPO to Will Rogers AGS.

Why: Consolidate AFFSA, AIS, and GATOPO at Will Rogers World Airport. Creates synergy between the Air Force administrative aviation functions and the Federal Aviation Administration located at Will Rogers World.

-- Joint Actions:

What: Transfer and consolidate Service ICPs at DLA.

Why: This recommendation together with elements of two other base closure recommendations supports the migration of the remaining Service Consumable Items to the oversight and management of a single DOD agency/activity. This proposal moves select Inventory Control Point functions (Budget/Funding, Contracting, Cataloging, Requisition Processing, Customer Services, Item Management, Stock Control, Weapon System Secondary Item Support, Requirements Determination, and Integrated Materiel Management Technical Support) to DLA. In addition, this recommendation realigns or moves the procurement management and related support functions for the procurement of DLRs to DLA. For both consumable items and the procurement management of DLRs, this recommendation provides the opportunity to further consolidate Service and DLA Inventory Control Points by supply chain type.

What: Privatize Supply, Storage and Distribution on specific commodities.

Why: This recommendation disestablishes the wholesale supply, storage, and distribution functions for all tires; packaged petroleum, oils and lubricants; and compressed gases used by the Department of Defense. The Department will privatize these functions and will rely on private industry for the performance of supply, storage and distribution of these commodities. By doing so, the Department can divest itself of inventories and can eliminate infrastructure and personnel associated with these functions. This recommendation results in more responsive supply support to user organizations and thus adds to capabilities of the future force. The recommendation provides improved support during mobilization and deployment, and the sustainment of forces when deployed worldwide. Privatization enables the Department to take advantage of the latest technologies, expertise and business practices which translates to improved support to customers at less cost. It centralizes management of tires; packaged petroleum, oils and lubricants; and compressed gases and eliminates unnecessary duplication of functions within the Department. Finally, this recommendation supports transformation by privatizing the wholesale storage and distribution processes from DOD activities.

What: Establish Joint Centers for Fixed Wing Air Platform R, D and A, and T and E.

Why: The Air Force intends to consolidate Development and Acquisition functions currently resident at Logistic Centers (Tinker AFB, Robins AFB, Ga., and Hill AFB) at Wright-Patterson AFB. These moves will increase efficiency by making a robust acquisition organization available to all Air Force Fixed Wing Air Platform D and A functions.

What: Consolidate Civilian Personnel Office to Randolph Air Force Base, Texas.

Why: The consolidation of Civilian Personnel Offices within each Military Department and the transactional functions among the Defense Agencies reduces excess capacity, reduces the use of leased facilities, and achieves manpower savings through consolidation and elimination of duplicate functions. This recommendation supports the Administration's urging of federal agencies to consolidate personnel services. During the implementation of this recommendation it is important to partner with the National Security Personnel System. NSPS provides the opportunity to improve the effectiveness of the Department through a simplified personnel management system that will improve the way it hires and assigns employees. This recommendation will be an effective tool for NSPS and provide the flexibility and responsiveness that supports the implementation of this system. Since NSPS will define a new human resource system featuring streamlined hiring, simplified job changes, and a less complex classification system, it covers all functions that would be supported by DOD Civilian Personnel.

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Appendix F Tinker Business and Industrial Park

THE MIDWEST CITY SUN
Thursday, December 4, 1986

Industrial park gets initial OK

By Robin Maxey
News Editor

The first steps in the redevelopment of 58 acres of a controversial parcel of land along Midwest City's west border were approved by the city council at its meeting last week.

The land located at the corner of SE 29th and Sooner Road has been the source of controversy since it was purchased by First Southern Baptist Church of Del City in 1982. The church planned to build a 6,000 seat auditorium and new church educational facilities on the property that was once a drive-in movie theater. However, Tinker Air Force Base and Oklahoma County officials stopped construction because the property lies within the final approach to Tinker's number two runway.

If the church was constructed on the sight, continuing to use the runway would endanger the lives of church patrons, officials said.

Tinker would have no recourse but to stop using the runway, which would limit its mission capabilities, and that would endanger many of the 26,100 jobs at the base, officials said.

Oklahoma County stepped in, and with the help of a number of financial institutions, convinced the church to build near SE 74th and Sooner Road. The church recently sold the property to Pecan Groves Interests.

PGI is planning to build an industrial park there. The plan has been approved by Tinker and does fall within the guidelines set up in Midwest City's Airport Zoning ordinance.

The city council approved the rezoning of the property to allow for industrial use and the preliminary plat of the park at its last meeting Nov. 25.

City officials have been working to try and establish an industrial park within the city in hopes of attracting businesses that contract with Tinker to the area.

DEPARTMENT OF THE AIR FORCE
HEADQUARTERS 2854TH AIR BASE GROUP (AFLC)
TINKER AIR FORCE BASE, OKLAHOMA 73145

13 MAY 1987

Mr Warren W. Thomas
Investment Financial Services
Oklahoma Division
P.O. Box 32838
Oklahoma City, OK 73123

Dear Mr Thomas

A review of the City of Midwest City letter, 9 March 1987 indicates the proposed land uses at the northeast corner of 29th Street and Sooner Road meet the Midwest City Tinker Air Force Base Zoning Ordinance.

All projects that are within the area of the Midwest City Tinker Air Force Base Zoning Ordinance and meet the requirements of that ordinance are compatible with the Air Force Air Installation Compatible Use Zone (AICUZ) recommendation.

All reference to the land use recommendation assumes the proper sound level reduction requirements have been met.

I appreciate your concern to keep Tinker AFB informed of your developments in the local area.

Sincerely

PHILLIP M. HUBBARD, Colonel, USAF
Base Commander

The Sunday Sun
Midwest City, Del City, Eastern Oklahoma County, Oklahoma
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Developer, city seeking 'common ground'

By Fount Holland
Staff Writer

Developers of the Tinker Business and Industrial Park objected at Monday's meeting of the Planning/Airport Zoning Commission to a proposed clarification of a city ordinance which would restrict the density of people allowed in the city's airport zoning areas.

MWC Mayor Charlie Wier said he hopes the city and developers can find a "common ground" on the matter, but said developers are hinting development of the park may not continue if the proposed density cap is imposed.

Warren Thomas, a managing partner in the Tinker Industrial Developers, said, "we're in here for the long haul."

City Manager Charles Johnson said the developers have applied for a permit and said it could be "granted at any time."

City officials said developers say a density level of 50 people per net acre is needed to make the development economically feasible.

One part of a three-pronged formula advanced by the city staff limits the project to 25 people per gross acre.

"We're dealing with areas that may be susceptible to aircraft crashes... so you begin to talk about issues of public safety," says Guy Henson, MWC director of development services.

An ordinance was passed in 1983 to adhere to recommendations the Department of Defense made to local municipalities during the 1970s, city attorney John Vincent said.

The ordinance does not include specific numbers, but only states "low density". Vincent said a clarification of that ordinance is now needed.

Johnson said because the permit had been requested prior to implementation of the revised ordinance, it would require that an administrative definition of "low density" be given.

The developers are operating under the guidelines outlined in a city ordinance adopted in 1983, Thomas said.

Thomas said the current development would not be affected if the council adopts new clarifications, but said he is concerned about the matter because of future interest in the city's development.

Commission Chairman Ed Keller said it is unclear whether the current project would be "grandfathered in" under the existing ordinance.

"What we are saying is that this ordinance would have prevented this project from beginning," he said.

Vincent said the intent of the ordinance is that there cannot be more than 125 people in one building.

Under the city staff proposal, the park could house 1,325 people, whereas a formula supported by park officials would allow the housing of 2,207.

The proposed density cap by the city staff, which restricts the number of employees per area space, was tabled at last week's meeting of the MWC Planning/Airport Zoning Commission and by the city council for further study.

Keller confirmed that developers have told the commission it "would be economically unfeasible to go ahead with their development project" if the density is restricted.

The commission meets again Tuesday to continue the Monday meeting which recessed after four hours.

The land purchased by the developers is located at the corner of SE 29 and Sooner Road which city staff said lies within an airport zoning area. The staff said safety is a key concern in the proposed density cap.

The purpose of the planned 62-acre facility would be to attract new businesses which officials have estimated could create 3,000 new jobs in the area. Thomas said the Department of Commerce has projected the development would eventually have $79 million payroll.

Council tables proposal

Tinker officials say zoning unacceptable

By Fount Holland
Staff Writer

Tinker Air Force Base, in a letter to Midwest City Mayor Charlie Wier, said a proposed ordinance recommended at a Monday night meeting of the MWC Airport Zoning Commision does not meet acceptable guidelines recommended by the AICUZ criterion.

AICUZ is a report written by Department of Defense in the 1970s and used as guidelines for municipalities around Air Force bases to establish zonings.

The proposed ordinance establishes a density level in an area termed Airport Zoning—1. The area lies under runway approaches at Tinker Air Force Base. But the ordinance proposed by the planning commission Monday night was tabled by the MWC city council the following evening. The council's decision will be final.

Controversy over the ordinance has centered around the development of the Tinker Industrial and Development Park.

Developers support passage of the ordinance recommended by the Airport Zoning Commission and have opposed efforts by the city staff to impose an ordinance which they say would restrict the development and make it economically unfeasible.

The level of density proposed by the Airport Zoning Commission would allow a maximum 50 people per gross acre on the MWC land located in the APZ1 area.

Because of the response received from Tinker, the MWC staff presented changes to the recommended ordinance which would limit the density level to 35 people per gross acre or 375 square foot of building per person. Also, the staff proposal would limit one building to 150 people.

At an earlier meeting of the Airport Zoning Commission, the staff's recommendations were rejected and the commission instructed the staff to prepare an ordinance based on guidelines at Mather Air Force Base which would allow a more liberal level of density.

But Brig. Gen. John R. Allen, in a letter sent to Wier on Tuesday prior to the council meeting, pointed to the danger of a large concentration of people in an area under the base runways.

Allen stated the proposed ordinance would allow 2,500 people in a single structure at the southeast corner of SE 29 and Sooner Road.

Tinker Air Force Base has objected to other proposed buildings at the same site. Efforts to construct the 1st Southern Baptist Church of Del City and a shopping mall by Landmark were halted after Tinker expressed safety concerns.

However, construction of the first building of the 15-building industrial park is already underway.

"The unobstructed use of our east/west runway without undue risk remains vital to Tinker and the community, and its importance will be even more critical when the Navy E-6 mission becomes operational at Tinker," Allen stated.

The development lies under the east/west runway which is only a secondary runway.

Allen recommended that an ordinance be structured along the lines of the one originally proposed by the city staff. He said the combination of criterion in the ordinance originally proposed would minimize the potential loss of life to aircraft accidents.

City Councilman Chuck Stith said the alternate runway is only used 7 percent of the time and said the number (recommended by staff) has never been qualified.

Developer Warren Thomas said there is now about $6.5 million invested in the development. Thomas said the intent of the development has not changed.

"We would not be in here, if we thought it was not in the best interest of Tinker.

Several comments were received from the audience.

MWC Chamber of Commerce President Elect Pam Hall urged the council to use caution when making a decision. Throughout the debate over the ordinance, the Chamber has maintained that Tinker Air Force Base provides the base for the area's economy. Chamber representatives have stated that nothing should be done to jeopardize the mission of Tinker.

Dick Hefton, publisher of *The Midwest City Sun*, said, "It appears that we may not be heading in a direction that is in the best interest of Tinker." Hefton urged the council to table the matter for further consideration.

The council tabled the motion until the latter part of January.

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Tinker Officials Endorse Industrial Park Proposal

By Judy Kuhlman
Staff Writer

MIDWEST CITY — Tinker Air Force Base officials have given their blessing to a revised proposal restricting the number of people allowed in buildings at an industrial park in the base's alternate runway flight path, officials said.

The modified proposal, which will be presented to the city council Tuesday, is the result of nearly nine months of research, zoning commission meetings and meetings between officials of the city, Tinker and the industrial park.

The revised proposal would limit the number of people who can occupy a building in Tinker Industrial and Business Park at SE 29 and Sooner Road, said city development services director Guy Henson.

The proposal sets forth several requirements for developments in runway flight paths.

A development with several buildings would be required to scatter them throughout the development and not concentrate them in one area, Henson said.

He said the proposal also would require that a developer construct earthen berms and plant trees and other types of plants to help minimize the possibility of casualities if an airplane crashed in the development.

Any development in a flight path also would be required to grant a type of permit for the base to use air space above the development and to exempt the city and base from any damages resulting from airplane noise, fumes and vibrations.

An earlier proposal which would have allowed several hundred people in a building at the industrial park was rejected by the city council in December.

The issue stirred a controversy between officials of the base and the industrial park over the number of people that should be allowed to work in buildings constructed at the industrial park.

The industrial park is a joint venture by Pecan Grove Interests Inc. and Tinker Developers, both headed by Warren Thomas. Russell Vaught is the park's general manager.

The council rejected the proposal presented in December after Brig. Gen. John R. Allen Jr. wrote a letter to the council saying he believed it allowed too many people per building.

Tinker's commander, Maj. Gen. Joseph Spiers, said earlier in a prepared statement that the Air Force has spent a "significant amount of time, effort and money" to ensure that both Tinker runways comply with Air Installation Compatible Use Zone requirements.

U.S. Rep. Dave McCurdy, whose congressional district includes Tinker, has said he hopes base officials will "use common sense" and support a compromise.

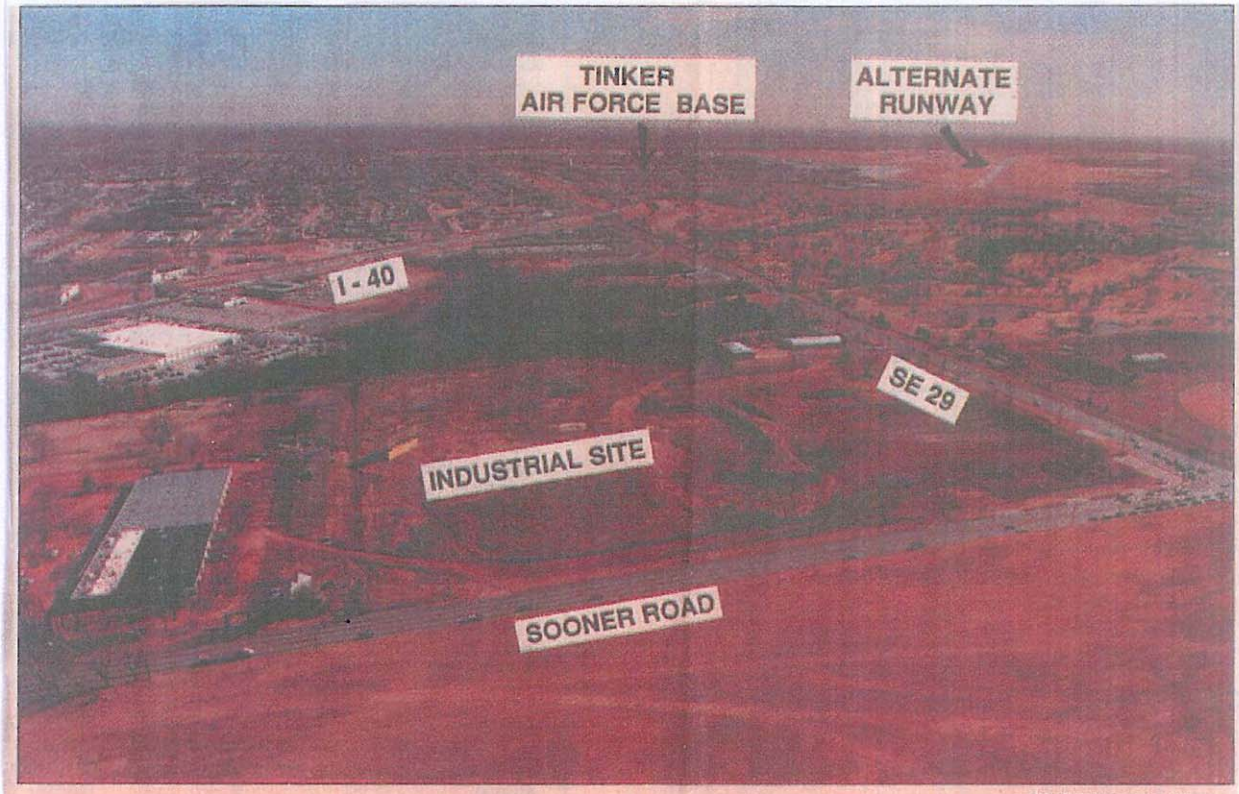
THE DAILY OKLAHOMAN/TIMES

Friday, January 19, 1990

XII.4

FRIDAY, JANUARY 26, 1990 THE DAILY OKLAHOMAN

OKLAHOMA CITY TIMES



—Staff Photo by George R. Wilson

This view toward the southeast shows the proposed business and industrial park's proximity to a Tinker Air Force Base runway.

Midwest City Ordinance Lauded

By Judy Kuhlman
Staff Writer

MIDWEST CITY — A Tinker Air Force Base general praised city officials this week for their adoption of an ordinance he said will protect the public safety and the base's mission.

Developers of a $65 million business park proposed for a site in a Tinker Air Force Base runway flight path also praised the city for clearing the way for completion of the project.

In a letter to the council, Brig. Gen. John R. Allen Jr. said the ordinance meets the "spirit and intent" of a federal Air Installation Compatibility Use Zone (AICUZ) study by protecting public safety and helping the base continue to attract large defense contracts.

"I would like to commend the various personnel from Midwest City and the community for their superb spirit of cooperation in working on the airport zoning ordinance and for their commitment to protecting the public interests regarding safety and accident potential," Allen said in the letter.

The ordinance adopted by the city council Tuesday restricts the number of people allowed in any building on land in a Tinker Air Force Base runway flight path. It also contains several requirements designed to minimize injuries or casualties in the event of an aircraft crash.

The ordinance was the last hurdle for developers of Tinker Business and Industrial Park at SE 29 and Sooner Road. The business park is a joint-venture of Pecan Grove Interests Inc. and Tinker Developers.

Russell Vaught, the park's general manager, and Warren Thomas, who heads Pecan Grove and Tinker Developers, started a round of applause after the council adopted the ordinance.

Several members of the audience joined in the applause. Mayor Charlie Wier recessed the meeting for further backpatting and congratulations to those who contributed to helping the city formulate the ordinance.

Councilman Chuck Stith said, "This city, county and state will not long forget what has been done here tonight. Nowhere in the United States is there a more restrictive AICUZ ordinance or policy."

Thomas also praised city officials for their cooperation in helping to find a solution agreeable to Tinker and the business park.

"This gives us a well-defined framework within which we can develop the project and provide the necessary assurance that the public safety and Tinker's mission have been protected."

The ordinance is the result of more than nine months of research, zoning commission meetings and meetings among officials of the city, the Air Force base and the industrial park.

Earlier proposals for developing the area were abandoned

See TINKER, Page 2

Continued

when Tinker officials complained about potential danger to the public safety or the base's mission.

A proposal presented to the council last month was rejected after Gen. Allen wrote a letter opposing it. In the letter he said he feared too many people could be allowed in one building at the business park.

More research was done by city employees, and three more meetings were conducted with representatives from the city council, the zoning commission, the business park and Tinker.

The resulting ordinance requires a developer of land in a runway flight path to construct earthen berms, plant trees and use other types of landscaping methods to minimize the hazards of an aircraft crash.

If several buildings are planned for such a site, they must be scattered over the development and not concentrated in one area.

Developers of land in a flight path also are required to grant a navigation easement allowing use of the air space above the development.

The ordinance also exempts the city and Tinker from any liability resulting from fumes, noise, vibration, dust, fuel, fuel particles or any other effects caused by an aircraft landing or taking off from Tinker.

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Appendix G Engrossed House Bill No. 2472

THE STATE SENATE
Monday, April 5, 2004

ENGROSSED

House Bill No. 2472

EHB 2472

ENGROSSED HOUSE BILL NO. 2472 - By: BRADDOCK of the House and HELTON and ALDRIDGE of the Senate.

An Act relating to cities and towns; amending 11 O.S. 2001, Section 43-101.1, as amended by Section 1, Chapter 41, O.S.L. 2002 (11 O.S. Supp. 2003, Section 43-101.1), which relates to land use hazardous to aircraft operation; updating reference to certain studies and recommendations; and providing an effective date.

BE IT ENACTED BY THE PEOPLE OF THE STATE OF OKLAHOMA:

SECTION 1. AMENDATORY 11 O.S. 2001, Section 43-101.1, as amended by Section 1, Chapter 41, O.S.L. 2002 (11 O.S. Supp. 2003, Section 43-101.1), is amended to read as follows:

Section 43-101.1 A. Any municipality in this state within which there lies wholly or in part an active-duty United States Air Force military installation, may enact a city ordinance specifying that within five (5) miles of the corporate limits of the military installation future uses on the property which may be hazardous to aircraft operation shall be restricted or prohibited. Such authority shall not extend into the corporate limits of another municipality.

B. The ordinance shall restrict or prohibit future uses within the five-mile area which:

1. Release into the air any substance which would impair visibility or otherwise interfere with the operation of aircraft, such as steam, dust or smoke unless such substance is generated from agricultural use;

2. Produce light emissions, either directly, or indirectly or by reflective light, which would interfere with pilot vision;

3. Produce electrical emissions which would interfere with aircraft communications systems or navigation equipment;

4. Attract birds or waterfowl including, but not limited to, operation of sanitary landfills and maintenance of feeding stations;

5. Provide for structures within ten (10) feet of aircraft approach, departure, or transitional surfaces;

6. Expose persons to noise greater than seventy-five (75) decibels; or

7. Detract from the aesthetic appearance, or otherwise create or promote an unsightly, unsanitary or unhealthy appearance of any entrance into the installation including, but not limited to, automobile or truck salvage yards, equipment storage sites or solid waste storage or disposal sites.

C. The ordinance shall restrict or prohibit future uses within the five-mile area which violate any Federal Aviation height restriction criteria.

D. 1. The ordinance shall be consistent with the most current recommendations or studies made by the United States Air Force installations located at Altus Air Force Base located in Altus, Oklahoma, Tinker Air Force Base located in Oklahoma City, Oklahoma, and Vance Air Force Base located in Enid, Oklahoma, entitled "Air Installation Compatible Use Zone Study"~~, Volumes I, II and III, dated October 1992~~ or studies made by the United States Department of the Army installations located at Fort Sill in Lawton, Oklahoma, entitled "Army Compatible Use Buffers" or any similar zoning relating to or surrounding a military installation as adopted by a county, city, or town or any combination of those governmental entities and shall be consistent with the most current recommendations; and

2. Interpretations of such ordinance shall consider ~~such~~ the recommendations or studies with a view to protection of the public and maintenance of safe aircraft operations.

E. ~~The~~ Subject to the provisions and requirements of paragraph 1 of subsection D of this section, the ordinance shall not prohibit single-family residential use on tracts of one (1) acre or more in area, provided that future construction shall comply with the "Guidelines for the Sound Insulation of Residences Exposed to Aircraft Operations, Wyle Research Report WR 89-7". Such

construction shall be regulated and inspected by the municipality's existing building permit and inspection ordinances and procedures.

SECTION 2. This act shall become effective November 1, 2004.

COMMITTEE REPORT BY: COMMITTEE ON VETERANS, MILITARY AFFAIRS & PUBLIC SAFETY, dated 3-29-04 - DO PASS.

Appendix H Public Involvement Activities

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www.acogok.org

NEWS RELEASE
For Immediate Release: October 4, 2007
Media contact: Jerry Church, 234-2264

SECURING FUTURE OF TINKER AIR FORCE BASE SUBJECT OF PUBLIC MEETING on OCT. 18

Cooperation, collaboration and future visioning are key tenets to a study that is currently being conducted between Tinker Air Force Base and the greater Oklahoma City metropolitan region.

The Association of Central Oklahoma Governments (ACOG) serves as the primary sponsor of the Joint Land Use Study (JLUS), which is funded by the US Department of Defense, Office of Economic Adjustment.

The study is a cooperative land use planning effort. It is designed to promote community growth and development that is compatible with Tinker's training and operational missions.

Public involvement and interaction is a primary component of the JLUS process. Citizens interested in the study and living in the vicinity of Tinker are invited to the first public meeting. The meeting will be held October 18, at 7 p.m. at the Reed Center, 5750 Will Rogers Road, in Midwest City.

ACOG serves as the study's sponsor. Partners are: Midwest City, Del City, Oklahoma City, Spencer, Choctaw, Nicoma Park, Oklahoma County, Cleveland County, the Oklahoma Strategic Military Planning commission, and Tinker Air Force Base.

While the focus of the JLUS is to protect the communities as well as address encroachment threats to the base, it will also strengthen Tinker's position when it comes to the next round of Base Realignment and Closure (BRAC) hearings.

Periodically, Congress initiates a BRAC process based on federal defense budgets, defense infrastructure and the relationships of communities with military installations in their hometowns. During the past two BRAC reviews, Tinker has not been negatively impacted by the process.

With the prospect of another BRAC process occurring in the coming years, the Central Oklahoma communities most impacted by Tinker's presence want to be prepared to fend off any efforts to close, or reduce its current missions.

MORE

SECURING TINKER SUBJECT OF LOCAL STUDY AND PUBLIC MEETING, Page 2

The annual economic impact of Tinker AFB is $3.4 billion. Employed at the base are 8,900 military personnel and 18,970 civilians. The annual payroll is $1.23 billion.

During the JLUS process, the consulting team of DFW Advisors, Michael R. Coker Company and Pavlik and Associates will study how Tinker interacts with adjacent cities and neighborhoods by analyzing existing development codes. Compatibility among all entities and property owners is key. Take off and landing patterns of planes at Tinker are reflected in what are referred to as noise contours and accident potential zones. Land uses within these areas will be studied in depth. The consulting team may ultimately recommend changes to zoning ordinances, subdivision regulation policies and building codes. Individual cities would then follow their own process for updating their ordinances and land development policies on a volunteer basis.

"The mayors, councilmembers and county commissioners of Central Oklahoma do not take Tinker Air Force Base for granted," said Zach D. Taylor, Executive Director of ACOG. "Tinker's continued vitality remains the number one legislative priority for our region."

For more information, visit **www.acogok.org/JLUS** or call Jerry Church, 234-2264.

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association of central oklahoma governments

JOINT LAND USE STUDY (JLUS) PUBLIC MEETING

Thursday, October 18, 2007
7:00 – 8:00 p.m.

The Reed Center, Exhibit Hall
5750 Will Rogers Road, Midwest City, OK 73110

AGENDA

A. Welcome and Introduction of Guests
Dave Howe, JLUS Policy Committee Chairman (5 min.)

B. JLUS Support by Tinker Air Force Base
Col. Tucker, 72 ABW/Vice Commander (3 min.)

C. Overview of Tinker AFB History and Economic Impact
Zach Taylor, ACOG Executive Director (10 min.)

D. Joint Land Use Study Overview and Schedule
James Falvo, DFW Advisor Co. Ltd. (10 min.)

E. Land Use, Development Strategies and Coordination
Michael Coker, AICP, Coker Company (10 min.)

F. Communication and Public Outreach
Linda Pavlik, Pavlik and Associates (5 min.)

G. Questions and Answers (12 min.)

H. Closing Remarks – Zach Taylor, ACOG Executive Director (5 min.)

21 E Main Street, Suite 100 Oklahoma City, OK 73104-2405 405.234.2264 FAX 234.2200 TTY 234.2217 www.acogok.org

MEETING SUMMARY

Joint Land Use Study (JLUS) Public Meeting

The Reed Center, Exhibit Hall

5750 Will Rogers Road, Midwest City, OK 73110

Thursday, October 18, 2007

7:00 pm

The first public meeting of the Joint Land Use Study (JLUS) was called to order by Dave Howe, JLUS Policy Committee Chairman. Among the elected officials and their representatives present were State Representative Gary Banz, State Representative Charlie Joyner, Del City Councilman Ken Bartlett, Midwest City Mayor Russell Smith, Midwest City Councilman Turner Mann, Oklahoma City Councilman Pete White, Col. Mona Lisa Tucker of Tinker Air Force Base, Col. David Parr of Tinker AFB, and Cyrena Eitler with the Department of Defense Office of Economic Adjustment.

Mr. Howe explained that the JLUS is a cooperative land use planning effort between Tinker Air Force Base and the surrounding Central Oklahoma community. It is designed to promote community growth and development that is compatible with Tinker's training and operational missions. Study partners are Midwest City, Del City, Oklahoma City, Spencer, Choctaw, Nicoma Park, Oklahoma County, Cleveland County, Oklahoma Strategic Military Planning Commission and Tinker Air Force Base. The Association of Central Oklahoma Governments (ACOG) is the study sponsor and the U.S. Department of Defense, Office of Economic Adjustment is the project manager.

Col. Lisa Tucker, ABW/Vice Commander, Tinker AFB, commented on the long history that the base and community share and said this relationship is one of the strongest relationships she has experienced at the 12 bases she has been assigned during her 22-year military career. JLUS is a great tool for local planners and the leadership at the base is looking forward to being a part of the dialogue, she said.

Presenting an overview of Tinker AFB's history and economic impact was Zach Taylor, Executive Director of ACOG. Referencing how the base and the Central Oklahoma community have "grown up together," he said that Tinker needs to be protected from the pressures of a Base Realignment and Closure process by making certain any land use concerns are resolved on the local level. Over the years, Oklahoma County has been involved in securing voter approval of bonds to cover costs associated with voluntary acquisition and condemnation of properties adjacent to the base that could have hampered the military's mission. The annual economic impact of Tinker is $3.4 billion. Employed at the base are 8,900 military personnel and 18,970 civilians. As the largest employer in the state of Oklahoma, the base has an annual payroll of $1.23 billion.

James Falvo, principal, DFW Advisors Ltd. Co., as the lead JLUS consultant, gave an overview of the process and contrasted the JLUS with the Air Force's Air Installation Compatible Use Zone (AICUZ) Study completed for Tinker AFB in December 2006. He

noted the establishment of a JLUS Policy Committee and Technical Work Group, and said that the JLUS Technical Work Group provides review of data and recommendations in regards to zoning ordinances, comprehensive plans and building codes. The JLUS Policy Committee provides oversight of the JLUS initiative sets policy and will be responsible for approval of the JLUS recommendations and reports. The JLUS goals are:

- To protect and promote the present and future operational capabilities of Tinker AFB.
- To increase communication and cooperation between the base and local jurisdictions.
- To identify appropriate regulatory and non-regulatory measures to ensure compatibility between existing and future land uses and base operations.

Health, safety and welfare concerns related to the local community include: (1) excessive installation noise identified by the Air Installation Compatible Land Use Zone (AICUZ) Study noise contours, and (2) potential incompatible development in the Clear Zone and Accident Potential Zones (APZ).

Encroachment occurs when communities continue to grow near and around military bases, exposing more people to safety and other concerns. Encroachment limits the ability to train and maintain operational readiness. Types of encroachment can include: high rise structures; urban lighting, smoke and dust; air quality; endangered wildlife species and habitat; fish and wildlife breeding seasons; crowded air space, visual and electronic eavesdropping and management of weapons and munitions.

Mr. Falvo emphasized the differences between AICUZ studies and the JLUS process. An AICUZ study is conducted by the military installation. It describes the base boundaries, the type of aircraft flown at the base, the mission, noise contour areas, accident potential zones, and other technical details.

The JLUS is the communities' study—not the military's. It provides persons outside the military the opportunity to understand fully the mission, flight operations and overall importance of the installation. Much broader in scope, the JLUS is designed to complement the AICUZ study and incorporate AICUZ information.

Michael Coker, AICP, president of the Michael Coker Company and a planning expert, outlined his approach to studying existing land uses around Tinker and explained how the consulting team will develop compatibility criteria and compatible land use alternatives as well as help to determine the feasibility of land use alternatives. Implementation strategies will also be developed. Draft and final reports will be presented for public comment this winter.

Linda Pavlik of Pavlik and Associates, communications consultant, emphasized the importance of public involvement and input during the JLUS. She encouraged everyone to keep informed through the local media and by signing up to receive periodic updates and meeting notices from ACOG. The JLUS information on ACOG's website can be used to contact the JLUS team. She also asked attendees to fill out the public comment sheet that was made available prior to the meeting.

Following the presentations, general comments were made and questions answered. It was emphasized that all cities and counties should have representatives of their planning departments fully participating in the JLUS. It was noted that Oklahoma City requires, for new construction, avigation easements which essentially gives the base the permission to fly in the area. An avigation easement is defined as an easement giving a property interest in air space over a particular portion of ground, providing for, among other things, the right of flight; the right to cause noise and dust, etc.; the right to remove all objects protruding into the airspace and the right to enter the land to enforce the rights required.

A representative of Midwest City commented on their positive relationship and support for Tinker. For example, when it snows, the first roads cleared are those that go in and out of the base. Some 38,000 people are using the base commissary so traffic management is very important.

Warren Thomas, representing Tinker Business and Industrial Park located at 29th Street and Sooner Road, said the private sector advocates for the base and his business is committed to the preservation and enhancement of Tinker and its mission. He noted that the private sector looks for consistency and predictability.

Jim Taheri said his property is located next to the county's land in Del City and used to be a mobile home park. He said he has spent thousands of dollars cleaning it up. Because Del City has rezoned it with certain restrictions, he cannot sell the property. He would like someone to help him with his challenges.

Participants were encouraged to use the ACOG website (www.acogok.org/jlus) to stay informed during the JLUS.

JOINT LAND USE STUDY (JLUS) PUBLIC MEETING

Thursday, October 18, 2007
7:00 – 8:00 p.m.

The Reed Center, Exhibit Hall
5750 Will Rogers Road, Midwest City, OK 73110

Attendance List

Name	Affiliation
Billy J. and Nell Williams	Del City homeowners
Donald Parker	Del City homeowner
Janelle Stafford	Tinker Business & Industrial Park
Warren Thomas	Tinker Business & Industrial Park
Tom and Pat Shimp	Del City homeowners
Jim Taheri	Del City property owner – 5009 SE 29th St.
Dave Dimick	Oklahoma City homeowner
Carol Parker	Del City homeowner
Roy Snell	Century 21 Malone's Homes
Glen Goldschlager	Midwest City resident
Hon. Gary W. Banz	State Representative
Hon. Charlie Joyner	State Representative
Hon. Russell Smith	Midwest City Mayor
Hon. Turner Mann	Midwest City Councilman
Hon. Pete White	Oklahoma City Councilman
Hon. Ken Bartlett	Del City Councilman
Col. Mona Lisa Tucker, ABW/Vice Commander	Tinker Air Force Base

JOINT LAND USE STUDY (JLUS) PUBLIC MEETING

Thursday, October 18, 2007
7:00 – 8:00 p.m.

The Reed Center, Exhibit Hall
5750 Will Rogers Road, Midwest City, OK 73110

Attendance List (Cont.)

Name	Affiliation
Col. David Parr	Tinker Air Force Base
Ralph Monson, Public Affairs	Tinker Air Force Base
Brion Ockenfels, Public Affairs	Tinker Air Force Base
Bill Dalke, Base Planner	Tinker Air Force Base
LouAnna Munkres, Community Planner	Tinker Air Force Base
Cyrena Eitler, Project Manager	Office of Economic Adjustment (OEA)
Dave Howe	JLUS Policy Committee Chairman
Tom Leatherbee, Planner	City of Del City
Judy Gordon, Economic Development Dir.	City of Del City
Anais Starr, Planner	City of Midwest City
James Falvo	DFW Advisors Ltd. Co.
Linda Pavlik	Pavlik and Associates
Michael Coker	Michael R. Coker Company
Zach Taylor	ACOG
Jane Sutter	ACOG
Jerry Church	ACOG
Holly Massie	ACOG

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www.acogok.org

NEWS RELEASE
For Immediate Release: February 13, 2008
Media contact: Jerry Church, 234-2264

SECURING FUTURE OF TINKER AFB SUBJECT OF PUBLIC MEETING on FEB. 28

Cooperation, collaboration and future visioning are key tenets to a study that is currently being conducted between Tinker Air Force Base and the greater Oklahoma City metropolitan region. The Association of Central Oklahoma Governments (ACOG) serves as the primary sponsor of the Joint Land Use Study (JLUS), which is funded by the US Department of Defense, Office of Economic Adjustment.

The study is a cooperative land use planning effort. It is designed to promote community growth and development that is compatible with Tinker's training and operational missions. Citizens interested in the study and living in the vicinity of Tinker are invited to a public meeting. The meeting will be held February 28, at 7 p.m. at the Midwest City Library, Room A, 8143 E. Reno Ave., in Midwest City.

At this meeting, the public will see a full presentation on the findings and recommendations in the JLUS draft report and the consultant team will receive further input from the public.

While the focus of the JLUS is to protect the communities as well as address encroachment threats to the base, it will also strengthen Tinker's position when it comes to the next round of Base Realignment and Closure (BRAC) hearings. With the prospect of another BRAC process occurring in the coming years, the Central Oklahoma communities most impacted by Tinker's presence want to be prepared to fend off any efforts to close, or reduce its current missions.

During the JLUS process, the consulting team is studying how Tinker interacts with adjacent cities and neighborhoods by analyzing existing development codes. Compatibility among all entities and property owners is vital.

ACOG serves as the study's sponsor. Partners are: Midwest City, Del City, Oklahoma City, Spencer, Choctaw, Nicoma Park, Oklahoma County, Cleveland County, the Oklahoma Strategic Military Planning commission, and Tinker Air Force Base.

For more information, visit **www.acogok.org/JLUS** or call Jerry Church, 234-2264.

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JOINT LAND USE STUDY (JLUS) PUBLIC MEETING

Thursday, February 28, 2008
7:00 – 8:00 p.m.

Midwest City Library, Room A
8143 E. Reno Avenue, Midwest City, Oklahoma

AGENDA

A. Welcome and Introduction of Guests
Dave Howe, JLUS Policy Committee Chairman

B. Joint Land Use Study Background and Status
James Falvo, DFW Advisors Ltd. Co.

C. JLUS Draft Report – Findings and Recommendations
Michael Coker, AICP, Coker Company

D. JLUS Public Outreach Activities
Linda Pavlik, Pavlik and Associates

E. Questions and Answers

F. Closing Remarks

Additional information on the Joint Land Use Study, including the JLUS Draft Report, is available at www.acogok.org/jlus or by contacting ACOG at 405/234-2264

21 E Main Street, Suite 100 Oklahoma City, OK 73104-2405 405 234 2264 FAX 234 2200 TTY 234 2217 www.acogok.org

MEETING SUMMARY

Joint Land Use Study Public Meeting

Midwest City Library, Room A, 8143 E. Reno Ave., Midwest City, OK 73110

Thursday, February 28, 2008

7:00 p.m.

The second public meeting of the Joint Land Use Study (JLUS) was called to order by David Howe, JLUS Policy Committee Chairman. He introduced John Johnson, interim director of the Association of Central Oklahoma Counties (ACOG). Among the elected officials and their representatives present were Del City Mayor Brian Linley, Del City City Manager Mark Edwards, Spencer City Manager Louis Smitherman, State Representative Gary Banz, and Col. Mona Lisa Tucker of Tinker Air Force Base.

Mr. Howe explained that the JLUS is a cooperative land use planning effort among Tinker Air Force Base and the surrounding central Oklahoma communities, sponsored by ACOG. Partners are Midwest City, Del City, Oklahoma City, Spencer, Choctaw, Nicoma Park, Oklahoma County, Cleveland County, the Oklahoma Strategic Military Planning Commission and Tinker AFB. The U.S. Department of Defense (DoD), Office of Economic Adjustment (OEA) is the funding agency.

James Falvo, principal, DFW Advisors, Ltd. Co., as the lead JLUS consultant, gave a brief overview of the process and contrasted the JLUS with the Air Force's Air Installation Compatible Use Zone Study (AICUZ), the latter being the military's formal process for recommending land use policies around the base to reduce their impact on the base's mission. The JLUS, in turn, belongs to the communities. The JLUS includes land development recommendations supportive of the base's mission, and is designed to complement the AICUZ and incorporates AICUZ information.

Health, safety and welfare concerns related to the local communities include: (1) excessive installation noise identified by the AICUZ noise contours, and (2) potential incompatible development in the Clear Zone (CZ) and Accident Potential Zones (APZ). Encroachment occurs when communities continue to grow near and around military installations, exposing more people to safety and noise concerns. Encroachment limits the ability to train and maintain operational readiness.

Michael Coker, AICP, president of the Michael R. Coker Company and a planning expert, discussed several recommendations for the surrounding communities included in the JLUS draft report, including the following:

- Developing a transfer of development rights program to maintain public safety and mission sustainability where development rights currently exist.
- Continuing to meet or exceed DoD recommendations for noise level reduction.
- Upgrading building codes to the most recent version of the International Building Code.
- Preparing a construction guide for builders, developers, architects, inspectors to clarify development and building guidelines in areas impacted by accident potential and noise.
- Encouraging positioning of structures on a development site for the purpose of reducing noise levels in the most noise-sensitive buildings.

Recommendations specific to cities and counties were outlined as follows.

Midwest City, Oklahoma City, Oklahoma County and Cleveland County

- Establishing guidelines for existing structures and new construction in the 65 plus dB DNL to participate in a sound attenuation program. Once a structure complies with the program, certification should be awarded to the property owner and recorded along with all other property ownership records.

Del City, Midwest City and Oklahoma City

- Modifying land use and comprehensive plans to minimize incompatible land uses in and around the base, particularly within *both* of the AICUZ accident potential zones.
- Incorporating a new land use category into Future Land Use Elements of comprehensive plans to promote compatible land use development surrounding Tinker AFB
- Allowing land to be placed in a temporary holding status to be turned over for compatible development at a future date

Midwest City and Oklahoma City

- Establishing land use policies against re-zoning land to any category permitting residential development within the existing or future 65 dB DNL contour unless sound attenuation will be achieved.
- Showing noise contour areas on all adopted Future Land Use Plan and zoning maps. All new development within these areas should be required to provide noise attenuation features

Spencer, Midwest City and Oklahoma City

- Allowing the purchase of avigation easements to ensure land use compatibility of properties within the 65 dB DNL or greater noise contour

Oklahoma County and Cleveland County

- Implementing disclosure process for structures located within AICUZ noise contours and accident potential zones at the initial advertisement of property (e.g., Multiple Listing Service database).

Oklahoma County and Tinker AFB

- Working with the state's agriculture department to help reduce the number of birds circling the landfill in the southeast sector.
- Determining the feasibility of closing Douglas Boulevard to address future needs for Tinker expansion

Tinker AFB

- Providing (or continuing to provide) detailed information regarding proposed development plans and future mission changes to surrounding communities.

Linda Pavlik of Pavlik and Associates, communications consultant, explained the importance of public input and reported meetings with all study partners, their staffs, and chambers of commerce. The next public meeting is scheduled in May, and she emphasized that the full draft report is available on line at www.acogok.org/jlus. Attendees were encouraged to fill out comment forms made available prior to the meeting.

Following the presentations, general comments were made and questions answered. One person questioned a proposed purchase of the GM plant by Oklahoma County and subsequent gift of the property to Tinker AFB. He said that the GM property is on the tax rolls, and if given to the military, it would become tax exempt. Mid-Del ISD depends on property taxes for its budget, he said, asking if the JLUS report could recommend a mechanism whereby the school district could receive dollars from this type of transaction. There was discussion about several area schools being located in the APZ II and how this use could be addressed. Linda Pavlik stated that some property owners present had expressed a concern to her that their neighborhoods would be cleared. Mr. Falvo told the group that condemnation of properties was not being recommended in the report.

JOINT LAND USE STUDY (JLUS) PUBLIC MEETING

Thursday, February 28, 2008
7:00 – 8:00 p.m.
Midwest City Library, Room A
8243 E. Reno Avenue, Midwest City, Oklahoma

Attendance List

Name	Affiliation
Glen Goldschlager	Midwest City resident
Lloyd and DeAnna Lumry	Midwest City residents
Billy J. Williams	Del City resident
Dorothy Rogers	Midwest City resident
Gary Haynes	Del City resident
Dwight W. Popes	Spencer resident
Janelle Stafford	Tinker Business and Industrial Park
Warren Thomas	Tinker Business and Industrial Park
John Estus	The Oklahoman
Hon. Gary Banz	State Representative
Hon. Brian Linley	Del City Mayor
Mark Edwards	City Manager, Del City
Louis Smitherman	City Manager, Spencer
Ruth Walters, Planner	Oklahoma County
Lt. Col. Mona Lisa Tucker	Tinker Air Force Base ABW/Vice Commander
Gene Gallogly	Tinker Air Force Base 72 ABW/CE
Bill Dalke, Base Planner	Tinker Air Force Base
LouAnna Munkres, Community Planner	Tinker Air Force Base
Ralph Monson	Tinker Air Force Base 72 ABW/PA
Dave Howe	JLUS Policy Committee Chairman

JOINT LAND USE STUDY (JLUS) PUBLIC MEETING

Thursday, February 28, 2008
7:00 – 8:00 p.m.
Midwest City Library, Room A
8243 E. Reno Avenue, Midwest City, Oklahoma

Attendance List (cont.)

Name	Affiliation
James Falvo	DFW Advisors Ltd. Co.
Michael Coker	Michael R. Coker Company
Linda Pavlik	Pavlik and Associates
John G. Johnson	ACOG Executive Director
Holly Massie	ACOG, Special Programs Officer
Jerry Church	ACOG, Communications Coordinator

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www.acogok.org

NEWS RELEASE

For Immediate Release: June 3, 2008
Media contact: Jerry Church, 234-2264

LAND USE AROUND TINKER AFB SUBJECT OF PUBLIC MEETING on JUNE 12

Cooperation, collaboration and future visioning are key tenets to a study that is currently being conducted between Tinker Air Force Base and the greater Oklahoma City metropolitan region.

The study is a cooperative land use planning effort. It is designed to promote community growth and development that is compatible with Tinker's training and operational missions. Citizens interested in the study and living in the vicinity of Tinker are invited to a public meeting. This will be the third public meeting since the study began last year.

The meeting will be held June 12, at 7 p.m., at the Del City Community Center, 4505 S.E. 15th Street, Room One, in Del City.

At this meeting, the public will see a full presentation on the final recommendations in the JLUS report.

The Association of Central Oklahoma Governments (ACOG) serves as the primary sponsor of the Joint Land Use Study (JLUS), which is funded by the US Department of Defense, Office of Economic Adjustment. Partners include: Midwest City, Del City, Oklahoma City, Spencer, Choctaw, Nicoma Park, Oklahoma County, Cleveland County, the Oklahoma Strategic Military Planning commission, and Tinker Air Force Base.

For more information, visit **www.acogok.org/JLUS** or call Jerry Church, 234-2264.

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JOINT LAND USE STUDY (JLUS) PUBLIC MEETING

Thursday, June 12, 2008
7:00 – 8:00 p.m.

Del City Community Center, Room One
4505 SE 15th Street, Del City, Oklahoma

AGENDA

A. Welcome and Introduction of Guests
Dave Howe, JLUS Policy Committee Chairman

B. Joint Land Use Study Background and Status
James Falvo, DFW Advisors Ltd. Co.

C. JLUS Recommendations
Michael Coker, AICP, Coker Company

D. Study Conclusion and Next Steps
James Falvo, DFW Advisors Ltd. Co.

E. Questions and Answers

F. Closing Remarks

Additional information on the Joint Land Use Study, including the JLUS Draft Report, is available at www.acogok.org/jlus or by contacting ACOG at 405/234-2264

21 E Main Street, Suite 100 Oklahoma City, OK 73104-2405 405 234 2264 FAX 234 2200 TTY 234 2217 www.acogok.org

MEETING SUMMARY

Joint Land Use Study Public Meeting

Del City Community Center

4505 S.E. 15th Street, Room One, Del City, OK 73115

Thursday, June 12, 2008

7:00 p.m.

The third public meeting of the Joint Land Use Study (JLUS) was called to order by David Howe, JLUS Policy Committee Chairman. Noting this was the greatest turn-out by the public at a community meeting, he introduced John Johnson, executive director of the Association of Central Oklahoma Counties (ACOG). Among the elected officials and their representatives present were State Senator Jim Reynolds, State Representative Gary Banz, State Representative Scott Inman, Oklahoma County Commissioner Brent Rinehart, Del City Mayor Brian Linley, Del City Councilman Ken Bartlett, Del City Councilman Larry McConnell. Chairman Howe also introduced Del City Manager Mark Edwards, Midwest City Manager Guy Henson, Lt. Col. David Parr of Tinker Air Force Base, and Gene Gallogly, Tinker AFB Director of Civil Engineering.

Mr. Howe explained that the JLUS is a cooperative land use planning effort among Tinker Air Force Base and the surrounding central Oklahoma communities, sponsored by ACOG. Partners are Choctaw, Del City, Midwest City, Nicoma Park, Oklahoma City, Spencer, Cleveland County, Oklahoma County, the Oklahoma Strategic Military Planning Commission and Tinker AFB. The U.S. Department of Defense (DOD), Office of Economic Adjustment (OEA) provided funding for the study. The JLUS review process to date has included two previous public meetings (Oct. 18, 2007 and Feb. 28, 2008) as well as numerous meetings of the policy committee and technical work group.

James Falvo, principal, DFW Advisors, Ltd. Co., as the lead JLUS consultant, said that the Air Force's Air Installation Compatible Zone (AICUZ) Study that preceded the JLUS contains land use compatibility guidelines based on noise exposure zones, Accident Potential Zones (APZ) and obstructions. The JLUS is a community-based study that includes recommendations for preserving the base's missions. It is designed to complement the AICUZ and uses AICUZ information as its foundation.

Two illustrations were shown and it was explained that new noise contours were established by the AICUZ study. The Air Force has delineated the land uses within these contours, as well as the APZs, that are deemed compatible with military operations. It was noted that the 2006 AICUZ Study also established an APZ II at both ends of the crosswind runway for the first time. The APZ II northwest of the crosswind runway extends into Del City.

Michael Coker of Michael M. Coker Company, a land planner serving as a consultant for the JLUS, explained the recommendations and actions listed in the following chart.

JLUS Summary of Recommendations

Recommendation	Action	Applicable Areas
Review Flight Path Corridors	Seek Tinker AFB input on public facilities locations, including schools, libraries, etc.	All local governments*
Revise Current Comprehensive Plans and Zoning Requirements	Modify Comprehensive Plans and Zoning ordinances to minimize incompatible land uses in and around the Base, particularly within both of the AICUZ accident potential zones.	Oklahoma City, Del City, Midwest City
Modify Land Use Policies Regarding Zoning Process	Establish land use policies against zoning land to any category permitting residential development within the 75 dB DNL or higher contour, or within the 65-74 dB DNL contour unless sound attenuation will be achieved.	Midwest City, Oklahoma City, Spencer,
Consider Purchase of Land within the APZ I and 75+ dB Noise Contour	Consider as an alternative to regulatory methods for preserving land and minimizing the development of incompatible land uses.	Del City, Midwest City, Oklahoma City
Create Voluntary Acquisition Program	Consider providing a voluntary acquisition program for residential properties and vacant land located within the APZ I areas.	Del City, Midwest City, Oklahoma City
Develop Voluntary Avigation Easement Program	Allow the acquisition of easements to ensure land use compatibility of properties within the 65 dB DNL or greater noise contour.	Spencer, Del City
Consider Fee Simple Purchase of a Portion of Land	Allow the purchase of a portion of property to protect open space, sensitive, or critical areas within AICUZ noise contours and accident potential zones.	Del City, Midwest City, Oklahoma City

Recommendation	Action	Applicable Areas
Establish Transfer of Development Rights Program	Develop a transfer of development rights program to maintain public safety and mission sustainability where development rights currently exist.	All local governments*
Allow Land Banking in APZs and 75+ dB DNL Areas	Allow land to be placed in a temporary holding status to be turned over for compatible development at a future date.	Del City, Midwest City, Oklahoma City
Develop Real Estate Disclosure Process	Implement disclosure process for structures located within AICUZ noise contours and accident potential zones at the initial advertisement of property (e.g., Multiple Listing Service database).	Oklahoma County, Cleveland County
Help Manage Bird Population	Work with the state's agriculture department to help reduce the number of birds circling the landfill in the southeast sector of Oklahoma City.	Oklahoma County, Tinker AFB
Limit Landfills and Protect Wetlands	Prohibit new sanitary landfill or wetland mitigation projects within 10,000 feet of aircraft runways. (Does not include retention or detention ponds.)	Del City, Midwest City, Oklahoma City, Oklahoma County
Update Building Codes	Continue to meet or exceed DoD recommendations for noise level reduction. Upgrade building codes to most recent version of the International Building Code.	Midwest City
Revise Ordinances	Ensure height and obstruction ordinances reflect current Air Force and Federal Aviation Administration (FAA) Part 77 requirements.	All local governments**
Develop Construction Guide	Prepare for builders, developers, architects and building inspectors to clarify noise compatibility guidelines.	All local governments**

Recommendation	Action	Applicable Areas
Modify Architectural Design for Noise Level Reduction	Encourage existing structures and require new construction in the 65+ dB DNL and higher to participate in a sound attenuation program. Once a structure complies with the program, certification should be awarded to the property owner and recorded along with all other property ownership records.	Midwest City, Oklahoma City, Spencer, Oklahoma County
Improve Acoustic Site Design	Encourage positioning of new structures within AICUZ noise contours on a development site for the purpose of reducing noise levels in the most noise-sensitive buildings.	Midwest City, Oklahoma City
Evaluate Closure of Part of Douglas Boulevard	Determine the feasibility of closing a portion of Douglas Boulevard related to development of the MROTC and future needs for Tinker expansion.	Tinker AFB, Oklahoma City, Midwest City, Oklahoma Department of Transportation, Association of Central Oklahoma Governments
Guard Against Urban Encroachment	Provide detailed information regarding proposed development plans and future mission changes.	Tinker AFB, All local governments***
Adopt Maximum Development Densities	Develop standardized distributed maximum densities for new development within AICUZ APZ I and II for various land uses.	Del City, Midwest City, Oklahoma City
Adopt Communication Strategy	Develop strategy and protocol for ongoing communication between Tinker AFB and surrounding communities to apprise each other of potential development within AICUZ accident and noise zones.	Tinker AFB, Del City, Midwest City, Oklahoma City, Spencer, Oklahoma County, Cleveland County

Recommendation	Action	Applicable Areas
Revise Maps	Show APZs I, II and AICUZ noise contours on all adopted Comprehensive Plan maps and/or Zoning maps.	Oklahoma County, Cleveland County, Del City, Midwest City, Oklahoma City

*Oklahoma County, Cleveland County, Choctaw, Del City, Midwest City, Oklahoma City, Nicoma Park and Spencer

**Choctaw, Del City, Midwest City, Oklahoma City, Nicoma Park and Spencer

***Oklahoma County, Cleveland County, Del City, Midwest City, Oklahoma City

Questions were raised by attendees about whether homeowners would be expected to move out of the area and the impact of the study on school locations. Mr. Falvo emphasized that residents are not expected to relocate. He said the JLUS makes recommendations for future new development. The consulting team, in a meeting with Mid-Del ISD administrators advised the school district that in the future, when new schools are built or when the student population shifts and schools may be considered for closure, it is imperative for the district to take into consideration JLUS recommendations as adopted by local jurisdictions.

A concern was expressed about traffic and the recommendation to consider partial closure of Douglas Boulevard. Attendees also asked about whether the planned shopping center at I-40 and Sooner Road in Del City could go forward. Mr. Falvo explained that the proposed development was within the APZ II and therefore certain uses such as restaurants and a hotel would not be considered compatible according to the AICUZ land use compatibility guidelines. One attendee asked about height restrictions in the APZ I and APZ II, and questioned why these types of restrictions were needed when the crosswind runway is used only about 7 percent of the time.

Del City Mayor Brian Linley said that Del City has already adopted, based on the AICUZ Study, interim guidelines that reduces the commercial density of the development at I-40 and Sooner from 40 to 10 percent lot coverage. He emphasized that safety is Del City's primary concern.

When a question was asked about the types of accidents that birds are responsible for, Lt. Col. David Parr explained that birds can fly into engines and cause fatal accidents. Tinker AFB actively manages the bird population at the base by cutting grass between 7 and 14 inches and shooting off cannons, the noise from which scares the birds.

In closing the meeting, Mr. Howe reminded the group that safety is paramount and the JLUS recommendations help the communities to understand what they should do to support the base and its missions.

JOINT LAND USE STUDY (JLUS) PUBLIC MEETING

Thursday, June 12, 2008
7:00 – 8:00 p.m.
Del City Community Center, Room One
4505 SE 15th Street, Del City, Oklahoma

Attendance List

Name	Affiliation
Dick Kanenchen	Del City resident / former mayor
Gale Snow	Oklahoma City resident
Jerry Zimmerman	Oklahoma City resident
Tom and Pat Shimp	Del City residents
Bill and Nell Williams	Del City residents
Patricia Ledbetter	Del City resident
Bill Giles	Del City
Carl Sullivan	Del City Chamber of Commerce
Dallas and Marilyn Miller	Del City residents
Sky Schaffer	Del City resident
Geraldine Day	Del City resident
Mary Setser	Del City North Neighborhood Watch
David and Marie Moore	Del City residents
Gerry Hayes	
Glen Gahn	
Yolanda Ikard Holman	Del City resident
Harold and Gretchen Santos	Del City residents
Sarge Patterson	Del City resident
Margarette Malone	Del City resident
John Inman	Del City resident

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Attendance List (cont.)

Name	Affiliation
Carolyn Inman	Del City resident
Ron Blachmore	Oklahoma City resident
Jo Ann Bartlett	Del City resident
Lisa Smith	Del City resident
Jim Marshall	Oklahoma County
Harry Birdwell	RCL Development
Warren Thomas	Tinker Business and Industrial Park
Mary Wright	Del City resident
Robert Cundiff	Del City resident
John Setser	Del City resident
Chip Carter	Trammell Crow Company
Hon. Jim Reynolds	State Senator
Hon. Gary Banz	State Representative
Hon. Scott Inman	State Representative
Hon. Brian Linley	Del City Mayor
Hon. Ken Bartlett	Del City Councilman
Hon. Larry McConnell	Del City Councilman
Hon. Brent Rinehart	Oklahoma County Commissioner Dist. 2
Mark Edwards	City Manager, Del City
Jim DePuy	Assistant City Manager, Del City

JOINT LAND USE STUDY (JLUS) PUBLIC MEETING

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Attendance List (cont.)

Name	Affiliation
Guy Henson	City Manager, Midwest City
Lt. Col. David Parr	Tinker Air Force Base
Gene Gallogly	Tinker Air Force Base 72 ABW/CE
Bill Dalke, Base Planner	Tinker Air Force Base
LouAnna Munkres, Community Planner	Tinker Air Force Base
Ralph Monson	Tinker Air Force Base 72 ABW/PA
Dave Howe	JLUS Policy Committee Chairman
James Falvo	DFW Advisors Ltd. Co.
Michael Coker	Michael R. Coker Company
Linda Pavlik	Pavlik and Associates
John G. Johnson	ACOG Executive Director
Holly Massie	ACOG, Special Programs Officer
Jerry Church	ACOG, Communications Coordinator

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Stakeholder Meetings

Presentations on the Tinker AFB Joint Land Use Study (JLUS) Draft Report were made to the following Central Oklahoma stakeholders at the dates, times and locations listed below:

February 19, 2008 (Tuesday)

8:30 a.m. – Oklahoma City Council, 200 N. Walker, 3rd Floor, City Hall
9:00 a.m. – Cleveland County Board of Commissioners, 201 S. Jones, Norman, County Courthouse
1:30 p.m. – Mid-Del Independent School District, 7217 SE 15th, MWC, Administration Building

February 21, 2008 (Thursday)

7:00 p.m. – Spencer City Council, 8300 NE 36th Street, City Hall

February 26, 2008 (Tuesday)

6:15 p.m. – Choctaw City Council (pre meeting), 2500 N. Choctaw Road, City Hall
7:15 p.m. – Midwest City Council, 100 N. Midwest Boulevard, City Hall

February 27, 2008 (Wednesday)

9:00 a.m. – Oklahoma County Board of Commissioners, 320 Robert S. Kerr, OKC, Courthouse

February 28, 2008 (Thursday)

11:30 a.m. – Midwest City Chamber of Commerce, East Is In Luncheon, Rose State College Student Center, Midwest City

March 3, 2008 (Monday)

6:00 p.m. – Del City Council (including Chamber representatives), 4517 SE 29th Street, City Hall

March 6, 2008 (Thursday)

9:30 a.m. – Mid-Del Board of Realtors, Midwest City
10:30 a.m. - OKC Chamber of Commerce-Greater OKC Partnership Group, 123 Park Ave., OKC

March 19, 2008 (Wednesday)

2:00 p.m. – Central Oklahoma Homebuilders Association, Oklahoma City

April 1, 2008 (Tuesday)

7:00 p.m. – Nicoma Park City Council, 2301 Nichols Drive, City Hall

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Committee Meetings

Meetings of the Joint Land Use Study Policy Committee and Technical Work Group were held on the following dates. All meetings were held in the ACOG Board Room at 21 E. Main Street in Oklahoma City and were open to the public. Agendas and minutes of the meetings are available from ACOG or on the following Web site: www.acogok.org/jlus.

Meeting Date	*Policy Committee*	*Technical Work Group*	*Consultant Evaluation Subc.**
May 4, 2007, 10:00 a.m.	X	X	
June 13, 2007, 1:30 p.m.			X
June 19, 2007, 9:00 a.m.			X
June 22, 2007, 10:00 a.m.	X		
September 21, 2007, 10:00 a.m.	X	X	
January 4, 2008, 10:00 a.m.	X	X	
January 11, 2008, 8:00 a.m.**	X	X	
February 1, 2008, 10:00 a.m.		X	
February 15, 2008, 10:00 a.m.	X		
April 25, 2008, 10:00 a.m.		X	
May 9, 2008, 10:00 a.m.	X		
June 3, 2008, 1:30 p.m.	X		
June 25, 2008, 10:00 a.m.	X	X	
July 18, 2008, 10:00 a.m.	X		

*A subcommittee of the Technical Work Group
**Tour of Tinker Air Force Base

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