



SHEPPARD AFB JOINT LAND USE STUDY

BACKGROUND REPORT

This study was prepared under contract with the City of Wichita Falls, with financial support from the Office of Economic Adjustment, Department of Defense. The content reflects the views of the City of Wichita Falls and the jurisdictions, agencies and organizations participating in the JLUS program, and does not necessarily reflect the views of the Office of Economic Adjustment.



MAY 2014

SHEPPARD AFB

JOINT LAND USE STUDY (JLUS)

BACKGROUND REPORT



*City of Wichita Falls Planning Division
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Wichita Falls, TX 76307*

Prepared by
Matrix 
DESIGN GROUP

May 2014

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ACKNOWLEDGEMENTS

Policy Committee

The Policy Committee (PC) served an active and important role in providing policy direction during the development of the Sheppard Air Force Base Joint Land Use Study. The Policy Committee was composed of the following individuals:

- **PC Chairperson: Glenn Barham**, Mayor
City of Wichita Falls, TX
- **Colonel Dieter Bareihs** (Former), Commander 80 FTW
US Air Force
- **Colonel Lance Bunch**, Commander 80 FTW
Sheppard Air Force Base
- **Brigadier General Michael Fantini** (Former), Commander 82 TRW
US Air Force
- **Dan Fears**, Mayor
City of Iowa Park, TX
- **Honorable Woodrow “Woody” Gossom**, County Judge
Wichita County, TX
- **Brigadier General Scott A. Kindsvater**,
Commander 82 TRW
Sheppard Air Force Base
- **Carl Law**, Mayor
City of Burkburnett, TX
- **Robyn Murphy**, Mayor
City of Cashion Community, TX
- **Jim V. Smith**, Councilmember
City of Frederick, OK
- **Kay Yeager**, Chair
Sheppard Military Affairs Committee

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- **Pat Norriss**, Commissioner, Precinct #2
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- **Colonel Om Prakash** (Former), Vice Commander 82 TRW
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Sheppard Air Force Base
- **Edwin L. Smith**, Councilmember
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- **Tom Whaylen**, President / CEO
Sheppard Military Affairs Committee
- **George Woodward**, Director of Public Affairs
Sheppard Air Force Base
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Sheppard Military Affairs Committee

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- **Brian Hackler**, Field Representative
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 - **Kami Moon**, District 63
State Representative Don Armes (R – OK)
 - **Rhonda Poirot**, District 69 Director
State Representative James Frank (R – TX)
 - **Bruce Redden**, Dallas Region Director
US Senator Ted Cruz (R – TX)
 - **Sandra Ross**, 13th District
US Congressman Mac Thornberry (R – TX)
 - **Johnny Sandmann**, 4th District
US Congressman Tom Cole (R – OK)
 - **Sandra Shelton**, District 31
State Senator Don Barrington (R – OK)
 - **Emily Shipley**, Southwest OK Field Rep
US Senator Tom Coburn (R – OK)
 - **Jennifer Smith**, District 30
State Senator Craig Estes (R – TX)
 - **John Wood**, North Texas Region Director
US Senator John Cornyn (R – TX)
-

Technical Committee

The Technical Committee (TC) served a key role in the development of the Sheppard Air Force Base Joint Land Use Study. They provided the overall technical support, review, and guidance of the study. The Technical Committee was composed of the following individuals:

- **TC Chairperson: Kevin Hugman, JLUS Project Manager**
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Airport Board of Adjustment Representative
- **John Burrus, Director - Traffic, Transportation and Aviation Department**
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- **Peter Clemo, Community Planner**
Sheppard Air Force Base
- **Preston Giles, Landowner**
Landowner Representative
- **Tim James, Former City Manager**
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- **Robert Johnston, City Manager**
City of Frederick, OK
- **Major Michael Kirk, 80th Operation Support Squadron**
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- **Karen Montgomery-Gagné, Planning Administrator**
City of Wichita Falls, TX
- **Mike Nieto, West Region Manager – Customer Operations**
Public Utilities, Oncor Electric Delivery
- **Colonel William Peterson, 82nd Mission Support Group**
Sheppard Air Force Base
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City of Iowa Park, TX
- **Miles Risley, City Attorney**
City of Wichita Falls, TX
- **Danny Steed, Broker / Owner, Hirschi Realtors**
Realtor Representative
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- **Tom Whaylen, President / CEO**
Sheppard Military Affairs Committee
- **Dennis Wilde, Executive Director**
North Texas Regional Planning Commission

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TABLE OF CONTENTS

Chapter	Page
Acronyms	v
Chapter 1: Introduction	1-1
1.1 What is a Joint Land Use Study?	1-2
1.2 Why Prepare a Joint Land Use Study?	1-3
1.3 Public Outreach	1-6
1.4 JLUS Study Areas	1-9
1.5 JLUS Organization	1-13
Chapter 2: Community Profile	2-1
2.1 Sheppard AFB Study Area Community Profile	2-2
2.2 Frederick Regional Airport Study Area	2-14
Chapter 3: Military Profile	3-1
3.1 Sheppard Air Force Base, Texas	3-2
3.2 Frederick Regional Airport, Oklahoma	3-20
Chapter 4: Existing Compatibility Tools	4-1
4.1 State Of Texas Plans and Programs	4-4
4.2 Texas Local Jurisdiction Planning Tools	4-7
4.3 Wichita County, TX.....	4-10
4.4 City of Wichita Falls, TX	4-10
4.5 City of Burkburnett, TX	4-12
4.6 City of Cashion Community, TX	4-13
4.7 City of Electra, TX	4-14
4.8 City of Iowa Park, TX.....	4-15
4.9 Town of Pleasant Valley, TX	4-15
4.10 State of Oklahoma Plans and Programs	4-16
4.11 Tillman County, OK	4-17
4.12 City of Frederick, OK.....	4-17
4.13 Sheppard AFB Tools	4-17
4.14 Federal Programs and Policies	4-19
4.15 Other References	4-23
Chapter 5: Compatibility Assessment	5-1
5.1 Methodology and Evaluation	5-3
5.2 Sheppard AFB Study Area Compatibility Factors.....	5-4
5.3 Frederick Regional Airport Study Area Compatibility Factors.....	5-26
5.4 Compatibility Tools	5-32

Figures And Tables

<i>Figure</i>		<i>Page</i>
Figure 1-1	Sheppard AFB Location Map	1-4
Figure 1-2	Sheppard AFB JLUS Regional Study Area.....	1-10
Figure 1-3	Sheppard AFB Study Area.....	1-11
Figure 1-4	Frederick Regional Airport Study Area.....	1-12
Figure 2-1	Wichita County Population Density, 2000	2-7
Figure 2-2	Wichita County Population Density, 2010	2-8
Figure 2-3	Building Permits in Wichita County 2000-2012	2-9
Figure 2-4	Wichita County NAICS Codes.....	2-11
Figure 2-5	Sheppard AFB Study Area Transportation.....	2-13
Figure 2-6	Tillman County Population Density, 2000	2-16
Figure 2-7	Tillman County Population Density, 2010	2-17
Figure 2-8	Frederick Regional Airport Study Area Transportation.....	2-19
Figure 3-1	Sheppard AFB Economic Impact FY12	3-4
Figure 3-2	Sheppard AFB Installation Setting	3-5
Figure 3-3	Sheppard AFB Land Use	3-6
Figure 3-4	Sheppard AFB Mission Footprint: Flight Patterns	3-13
Figure 3-5	Sheppard AFB Mission Footprint: Imaginary Surfaces	3-15
Figure 3-6	Imaginary Surfaces Cross-Section.....	3-16
Figure 3-7	Sheppard AFB Mission Footprint: Runway Safety Zones	3-17
Figure 3-8	Sheppard AFB Mission Footprint: Noise Zones	3-19
Figure 3-9	Frederick Regional Airport Installation Setting	3-21
Figure 3-10	Frederick Regional Airport Flight Patterns	3-23
Figure 3-11	Frederick Regional Airport Mission Footprint: Runway Safety Zones	3-25
Figure 3-12	Frederick Regional Airport Mission Footprint: Imaginary Surfaces	3-26
Figure 5-1	Incompatible Lands Under Runway Safety Zones	5-11
Figure 5-2	Bird / Aircraft Strikes Involving Sheppard AFB Aircraft, 2003-2013	5-12
Figure 5-3	Existing Identified Vertical Obstructions Around Sheppard AFB.....	5-14
Figure 5-4	Change in AICUZ Noise Zones from 1999 to 2011.....	5-17
Figure 5-5	Properties with Potentially Incompatible Structures Under Noise Zones	5-18
Figure 5-6	Frederick Regional Airport Runway Safety Zones	5-29
Figure 5-7	Frederick Regional Airport Runway Imaginary Surfaces.....	5-30

<i>Table</i>		<i>Page</i>
Table 1-1.	JLUS Sponsor Responsibilities and Participants	1-7
Table 1-2.	JLUS PC Responsibilities and Participants.....	1-7
Table 1-3.	JLUS TC Responsibilities and Participants.....	1-7
Table 2-1.	Wichita County Population, 2000-2010.....	2-6
Table 2-2.	Forecasted Population in Wichita County, 2010-2050	2-9
Table 2-3.	Existing Housing Stock in 2010.....	2-9
Table 2-4.	Median Monthly Gross Rent in Surrounding Jurisdictions, 2000-2012.....	2-10
Table 2-5.	Median Housing Values, 2000-2012.....	2-10
Table 2-6.	Sheppard AFB BAH 2013	2-10
Table 2-7.	Median Household Income Change, 2000-2012.....	2-12
Table 2-8.	Tillman County Population, 2000-2010	2-15

Table 2-9.	Forecasted Population in Tillman County and City of Frederick, 2010-2030.....	2-15
Table 2-10.	Existing Housing Stock in 2010.....	2-15
Table 2-11.	Median Housing Values, 2000-2012.....	2-15
Table 2-12.	Median Household Income Change, 2000-2012.....	2-18
Table 3-1.	Sorties and Hours Flown by Type of Aircraft, 2012.....	3-11
Table 4-1.	City and County Planning Tools.....	4-9
Table 5-1.	Generalized Existing Land Use Within Sheppard AFB CZs and APZs Off-Base	5-9
Table 5-2.	Off-Base Acres and Population Within the Noise Contours of Sheppard AFB.....	5-19
Table 5-3.	Generalized Existing Land Use Within the Sheppard AFB Noise Contours Off-Base.....	5-19

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80 FTW 80th Flying Training Wing
82 TRW 82nd Training Wing

A

AETC Air Education and Training Command
AFB Air Force Base
AGL above ground level
AICUZ Air Installation Compatible Use Zone
APZ Accident Potential Zone
AT / FP Anti-Terrorism / Force Protection
ATC Air Traffic Control

B

BAH Base Allowance for Housing
BASH Bird Aircraft Strike Hazard
BHWG Bird Hazard Warning Group
BLM Bureau of Land Management
BRAC Base Realignment and Closure

C

CIP capital improvements plan
COMBS Contractor Operated and Maintained
Base Supply
CP comprehensive plan
CWA Clean Water Act
CZ Clear Zone

D

DFW Dallas-Fort Worth
DNL day-night average sound level
DOD Department of Defense

E

EA environmental assessment
EIS environmental impact statement
ENJJPT Euro-NATO Joint Jet Pilot Training
EOD explosive ordnance disposal
EPA Environmental Protection Agency
ESA Endangered Species Act
ETJ extraterritorial jurisdiction

F

FAA Federal Aviation Administration
FRLPP Farms and Ranch Lands Protection
Program
FY fiscal year

G

GO general obligation

H

HB House Bill
HCP Habitat Conservation Plan

I

IBC International Building Code
IFF Introduction to Fighter Fundamentals
IFR instrument flight rules
IGA intergovernmental agreement
INRMP Integrated Natural Resources
Management Plan
IRC International Residential Code

J

JLUS Joint Land Use Study
 JPPT Joint Primary Pilot Training
 JSF Joint Strike Fighter

L

LUP Land Use Plan

M

MIA Military Influence Area
 MOU memorandum of understanding
 MPEC Multi-Purpose Events Center
 MPO Metropolitan Planning Organization
 MSL mean sea level
 MTR military training route

N

NACO National Association of Counties
 NAICS North American Industry Classification System
 NATO North Atlantic Treaty Organization
 NCCP Natural Community Conservation Plan
 NCO Noncommissioned Officer
 NDAA National Defense Authorization Act
 NEPA National Environmental Policy Act
 NGOs nongovernmental organizations
 NLR noise level reduction
 NOAA National Oceanic and Atmospheric Administration
 NPDES National Pollutant Discharge Elimination System

O

OEA Office of Economic Adjustment
 OREC Oklahoma Real Estate Commission

P

PC Policy Committee
 PRPRPA Private Real Property Rights Preservation Act

R

RCS Recovery Credit System
 REPI Readiness and Environmental Protection Initiative
 RSUs runway supervisory units

S

SAFB Sheppard Air Force Base
 SB Senate Bill

T

TAC Technical Advisory Committee
 TC Technical Committee
 TCEQ Texas Commission on Environmental Quality
 TIA Takings Impact Assessment
 TPC Transportation Policy Committee
 TREC Texas Real Estate Commission

U

UPT Undergraduate Pilot Training
 US United States
 USAF United States Air Force
 USFWS US Fish and Wildlife Service

W

WMA Wildlife Management Area
 WHMP Wildlife Hazard Management Plan



CHAPTER 1: INTRODUCTION

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CHAPTER 1: INTRODUCTION

Military installations are critical to local economies, generating thousands of jobs and millions of dollars in economic activity and tax revenue annually. In the past, incompatible development has been a factor in the loss of training operations and restructuring of mission-critical components to other military installations. To protect the missions of military installations and the health of economies and industries that rely on them, encroachment must be addressed through collaboration and joint planning between installations and local communities. This Joint Land Use Study (JLUS) attempts to mitigate future issues and strengthen coordination between the local communities and the technical training and pilot training programs at Sheppard Air Force Base (AFB) and Frederick Regional Airport.

Sheppard AFB is located in north-central Texas, five miles north of the City of Wichita Falls' Downtown Business District. The installation encompasses approximately 4,633 acres and has four runways, three of which are used by the City of Wichita Falls Regional Airport, and supports commercial and general aviation activities. The United States Air Force (USAF) also has an agreement with an auxiliary airfield in Frederick, Oklahoma located approximately 57 miles northwest of Sheppard AFB.

There are several communities around Sheppard AFB that also participated as partners in this JLUS. They are the cities of Burkburnett, Cashion Community, Electra, Iowa Park, Wichita Falls, and Frederick (Oklahoma), the Town of Pleasant Valley, and the counties of Wichita and Tillman (Oklahoma). An organized communication effort between these jurisdictions, Sheppard AFB, and other stakeholder entities that own or manage land or resources in the region is needed to ensure that future growth around Sheppard AFB is coordinated and is compatible with military training activities.

1.1	What Is A Joint Land Use Study?	1-2
	JLUS Goal.....	1-3
	JLUS Objectives	1-3
1.2	Why Prepare a Joint Land Use Study?.....	1-3
	Regional Economic and Local Importance	1-5
	Military Strategic Importance	1-5
	Local Communities Working Together.....	1-5
1.3	Public Outreach	1-6
	Stakeholders	1-6
	Policy Committee and Technical Committee.	1-6
	Public Forums	1-8
	Public Outreach Materials.....	1-9
1.4	JLUS Study Areas.....	1-9
1.5	JLUS Organization.....	1-13
	JLUS Report	1-13
	Background Report.....	1-13

1.1 What is a Joint Land Use Study?

A Joint Land Use Study (JLUS) is a planning process accomplished through the collaborative efforts of a comprehensive list of stakeholders in a defined study area in order to identify compatible land uses and growth management guidelines within, and adjacent to, active military installations. These stakeholders include local community, state, and federal officials, residents, business owners, local tribal governments, nongovernmental organizations, and the military.

The intent of the process is to establish and encourage a working relationship among military installations and their proximate communities to act as a team to prevent and / or reduce encroachment issues associated with future mission expansion and local growth. Encroachment refers to incompatible uses of land, air, water, and other resources that may individually or cumulatively impact the military's ability to carry out its testing and training mission.

A JLUS culminates in a set of recommendations or potential guidelines that can be implemented by identified stakeholders to promote compatible development and relationships between the military and neighboring communities for the present and future. As such, a JLUS may become an adopted plan for establishing compatible land use regulations.

Although primarily federally funded by the Department of Defense (DOD), Office of Economic Adjustment (OEA), a JLUS is produced by and for local communities. The project management entity for the Sheppard AFB JLUS is the City of Wichita Falls.

This JLUS is important to preserve long-term land use compatibility between Sheppard AFB and the surrounding jurisdictions and to better protect the health, safety, and welfare of surrounding communities and the civilian and military community at Sheppard AFB. The JLUS is representative of collaboration between Sheppard AFB and the local county and city governments for the purpose of planning for compatible land use, while ensuring the continued presence of the military.

JLUS Goal

The goal of the Sheppard AFB JLUS is to protect the viability of current and future training operations, while simultaneously guiding community growth, sustaining the environmental and economic health of the region, and protecting public health, safety, and welfare.

JLUS Objectives

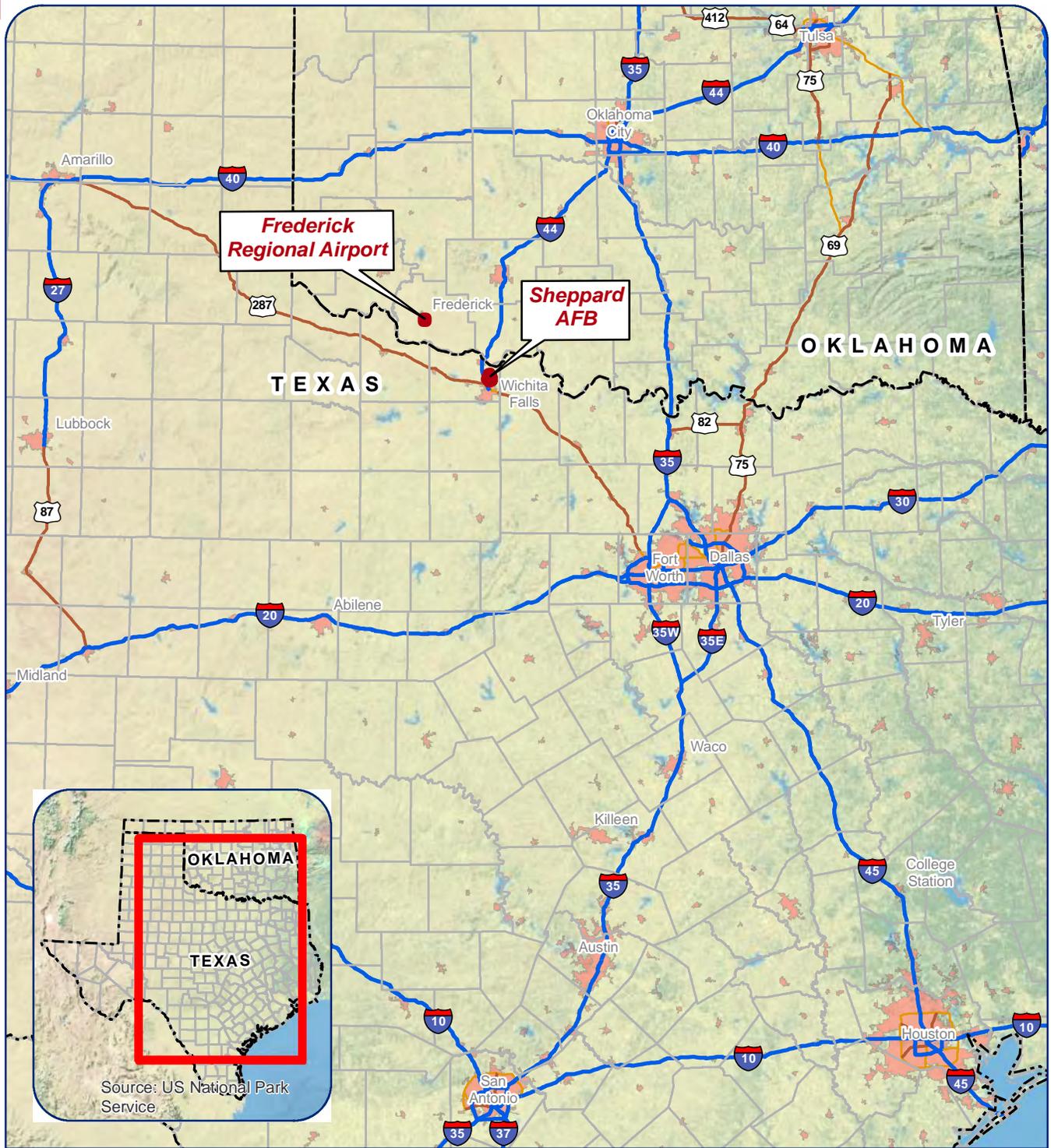
To help meet this goal, three primary JLUS objectives were identified.

- **UNDERSTANDING.** Convene community and military representatives to identify, confirm, and understand the issues in an open forum, taking into consideration both community and Sheppard AFB perspectives and needs. This includes public awareness, education, and input organized in a cohesive outreach program.
- **COLLABORATION.** Encourage cooperative land use and resource planning among Sheppard AFB and surrounding communities so that future community growth and development are compatible with the training and operational missions at Sheppard AFB, while at the same time seeking ways to reduce operational impacts on adjacent lands.
- **ACTIONS.** Provide a set of mutually supported tools, activities, and procedures from which local jurisdictions, agencies, and Sheppard AFB can select, prepare, and approve / adopt and then use to implement the recommendations developed during the JLUS process. The actions proposed include both operational measures to mitigate installation impacts on surrounding communities, and local government and agency approaches to reduce community impacts on military operations. These tools will help decision makers resolve compatibility issues and prioritize projects within the annual budgeting process of their respective entity / jurisdiction.

1.2 Why Prepare a Joint Land Use Study?

Although military installations and nearby communities may be separated by a fence line, they often share natural and manmade resources such as land, airspace, water, and infrastructure. Despite the many positive interactions among local jurisdictions, agencies, and the military, and because so many resources are shared, the activities or actions of one entity can pose unintended negative impacts on another, resulting in conflicts. As communities develop and expand in response to growth and market demands, land use approvals have the ability to locate potentially incompatible development closer to military installations and operational / training areas. The result can initiate new, or foster existing, land use and other compatibility issues, often referred to as encroachment, which can have negative impacts on community safety, economic development, and sustainment of military activities and readiness. This threat to military readiness activities is currently one of the military's greatest challenges.

Collaboration and joint planning among military installations, local communities, and agencies should occur to protect the long-term viability of existing and future military missions. Working together also enhances the health of economies and industries of the communities before incompatibility becomes an issue. Recognizing the close relationship that should exist between installations and adjacent communities, the OEA implemented the JLUS program in an effort to mitigate existing and future conflicts and enhance communication and coordination among all affected stakeholders. This program aims to preserve the sustainability of local communities within the JLUS Study Area while protecting current and future operational and training missions at Sheppard AFB.



Legend

- Facilities Covered by JLUS
- State Boundary
- County Boundary
- Interstate
- US Highway
- State/County Highway

Matrix
DESIGN GROUP

0 30 60
Miles

Source: Esri 2012.

**Figure 1-1
Sheppard AFB Location Map**

Regional Economic and Local Importance

Sheppard AFB is located in north-central Texas, just south of the border of Oklahoma (see Figure 1-1), and five miles north of City of Wichita Falls' Downtown Business District.

It sits near Interstate 44. Sheppard AFB is bordered by the City of Wichita Falls to the west and south, the incorporated City of Cashion Community north of the Base runways, and unincorporated lands within Wichita County on the remaining sides. Within this region, Sheppard AFB is an important economic engine, which supported approximately 14,500 people in fiscal year (FY) 2012, including 6,469 military personnel, 3,430 civilians, and the remaining were military dependents. In FY 2012, Sheppard AFB's economic benefit to local communities was greater than \$894.7 million.

Military Strategic Importance

Sheppard AFB has the distinction of being the only base in the Air Force with both a technical training wing and a flying training wing mission. The 82nd Training Wing serves as the Air Force's premier technical training unit and graduates more than 60,000 Airmen annually. Fifty percent of all first-term Airmen go through the courses offered by Sheppard AFB. There are over 900 formal courses, with 61 locations (satellite facilities) associated with the courses at Sheppard AFB around the world. The 80th Flying Training Wing is home to the Euro-NATO Joint Jet Pilot Training (ENJJPT) Program, which is the world's only multi-nationally manned and managed training program for training combat pilots for NATO. The program is made up of 13 partner countries and pilots from the various nations are trained at Sheppard AFB. Additional details on Sheppard AFB's missions and activities are described in Chapter 3, Military Profile.

Local Communities Working Together

As a community presence, Sheppard AFB contributes much more than just an economic engine. Sheppard AFB is used by numerous entities including military, federal, and local agencies. Personnel at Sheppard AFB operate the joint-use runways, which are shared with commercial flights at Wichita Falls Regional Airport. In addition, Sheppard AFB hosts a variety of community events throughout the year, including base tours, holiday breakfasts / lunches, awards ceremonies, memorial ceremonies, etc.

Sheppard AFB engages in many public outreach efforts to make itself a greater part of the local and regional community. The Sheppard AFB Area Community Relations Council is operated by the Sheppard AFB Public Affairs Office and meets on a quarterly basis, rotating meetings between Wichita Falls, Iowa Park, Burkburnett, and Sheppard AFB. The primary function of the council is to discuss projects, events, and issues of mutual interest and responsibility to ensure that all parties have an understanding of the base mission and how to appropriately accommodate new growth in the region.

The Sheppard Military Affairs Committee (SMAC) was developed in response to the 2005 Base Realignment and Closure (BRAC) Commission decision to move basic medical training from Sheppard AFB to Fort Sam Houston in San Antonio, TX. SMAC is a community-based non-profit organization that serves to protect the future of Sheppard AFB by communicating concerns between the base and the regional communities to maintain and strengthen the relationship between the base and the communities. Through this working relationship, SMAC is able to advocate for Sheppard AFB and provide a voice for the residents of the communities. SMAC supports many community activities hosted by Sheppard AFB and works with the Public Affairs Office to oversee the Squadron Adoption Program. This program partners local area business and civic and philanthropic organizations throughout Wichita County with military personnel from other countries stationed at Sheppard AFB and encourages the "adopter" to engage the "adoptee" in local activities so that both parties can get insight into the culture and interests of each other.

In January 2012, the Altus Trophy was awarded to the Sheppard communities of Wichita Falls, Burkburnett, Electra, and Iowa Park by the Air Force Air Education and Training Command (AETC) and the Altus Military Affairs Committee. This award is presented annually to a civilian community for its outstanding support of a nearby AETC base or unit in the spirit of cooperation.

1.3 Public Outreach

As highlighted in the objectives stated previously, the JLUS process was designed to create a locally relevant plan that builds consensus and obtains support from the various stakeholders involved. To achieve the JLUS goal and objectives, the JLUS process included a stakeholder and public outreach program that included a variety of opportunities for interested parties to contribute to its development.

Stakeholders

An early step in any planning process is the identification of stakeholders. Informing or involving them early in the project is instrumental in the identification of their most important compatibility issues to address and resolve through the development of integrated strategies and measures. Stakeholders include individuals, groups, organizations, and governmental entities interested in, affected by, or affecting the outcome of the JLUS project. Stakeholders identified for the Sheppard AFB JLUS included, but were not limited to:

- Local jurisdictions (cities and counties)
- DOD officials (including OEA representatives) and military installation personnel
- Local, regional, and state planning, regulatory, and land management agencies
- Landholding and regulatory federal agencies
- The public (including residents and landowners)
- Environmental advocacy organizations
- Nongovernmental organizations (NGOs)
- Other special interest groups (including local educational institutions and school districts)

Policy Committee and Technical Committee

The development of the Sheppard AFB JLUS was guided by two committees, comprising city, county, Sheppard AFB, federal and state agencies, resource agencies, local governments, and other stakeholders.

JLUS Policy Committee (PC): The PC consists of officials from participating jurisdictions, military installation leadership, and representatives from other interested and affected agencies. The PC is responsible for the direction of the JLUS, preparation and approval of the study design, approval of policy recommendations, and approval of draft and final JLUS documents.



PC Meeting #2, January 31, 2013

JLUS Technical Committee (TC): The TC is responsible for identifying and studying technical issues. Membership includes area planners, military base planners, business and development community representatives, and other subject matter experts as needed to help assist in the development and evaluation of implementation strategies and tools. Items discussed by the TC were brought before the PC for consideration and action.

The PC and TC served as liaisons to their respective stakeholder groups. PC and TC members were charged with conveying committee activities and information to their organizations and constituencies and relaying their organization's comments and suggestions to both committees for consideration. PC members were encouraged to set up meetings with their organizations and / or constituencies to facilitate this input. The responsibilities and list of participants for the JLUS sponsors, the PC, and the TC are identified in Tables 1-1, 1-2, and 1-3, respectively.



TC Meeting Number #3, May 7, 2013

Table 1-1. JLUS Sponsor Responsibilities and Participants

Responsibilities	Participants
<ul style="list-style-type: none"> ■ Coordination ■ Accountability ■ Grant Management ■ Financial Contribution 	<ul style="list-style-type: none"> ■ Office of Economic Adjustment ■ City of Wichita Falls

Table 1-2. JLUS PC Responsibilities and Participants

Responsibilities	Participants
<ul style="list-style-type: none"> ■ Policy Direction ■ Study Oversight ■ Monitoring ■ Report Adoption 	<ul style="list-style-type: none"> ■ City of Burkburnett, TX ■ City of Cashion Community, TX ■ City of Frederick, OK ■ City of Iowa Park, TX ■ City of Wichita Falls, TX ■ Sheppard AFB ■ Sheppard Military Affairs Committee ■ State elected officials ■ Wichita County, TX

Table 1-3. JLUS TC Responsibilities and Participants

Responsibilities	Participants
<ul style="list-style-type: none"> ■ Identify Issues ■ Provide Expertise to Address Technical Issues ■ Evaluate and Recommend Implementation Options to the PC ■ Provide Draft and Final Report Recommendations to the PC 	<ul style="list-style-type: none"> ■ Airport Board of Adjustment ■ City of Burkburnett, TX ■ City of Frederick, OK ■ City of Iowa Park, TX ■ City of Wichita Falls, TX ■ North Texas Regional Planning Commission ■ Oncor Electric ■ Private land owner representative ■ Realtor representative ■ Sheppard AFB ■ Sheppard Military Affairs Committee ■ Wichita County

Meetings were held throughout the process to ensure the JLUS identified and appropriately addressed local issues. The meetings conducted are highlighted as follows:

- **Meeting #1 (October 17, 2012):** This meeting served as the initial kick-off for the committees with the project consultant. This meeting provided an overview of the JLUS project, and presented information on the JLUS program and process. At the end of the meeting, attendees were asked to identify their thoughts on any current or potential future compatibility issues.
- **Meeting #2 (January 29 [TC] and 31 [PC], 2013):** This meeting provided information about the January 29th public forum to PC and TC members. Preliminary compatibility issues identified at the public forum were discussed at the PC meeting. Committee members' inputs on potential compatibility issues were provided. The JLUS Study Area was also discussed and refined.
- **TC Meeting #3 (May 7, 2013):** This meeting presented the first look at the Work-In-Progress Draft Background Report for the committee to review and provide comments on any missing or incorrect information to be updated in the report to prepare the Committee Draft. The draft compatibility issues were also reviewed and revised during this meeting. Lastly, this meeting presented the Draft Community Compatibility Assessment Tool map program to the committee.
- **PC Meeting #3 (August 29, 2013):** The third PC meeting provided committee members with an update of the JLUS process and an overview of the TC comments and revisions to the Work-In-Progress Draft Background Report and the draft compatibility issues. This meeting also presented an overview of the preliminary JLUS recommendations.
- **TC Meeting #4 (August 27, 2013):** The fourth TC meeting updated members with the changes that were made to the Work-In-Progress Draft Background Report and draft compatibility issues. This meeting also presented an overview of the preliminary JLUS recommendations.

- **PC Meeting #4 (February 27, 2014):** The fourth PC meeting presented the Public Draft JLUS and Background Report to the committee members. During this meeting, an overview of the TC meeting and Frederick public forum were discussed and details for the Wichita Falls public forum occurring in the evening were provided.
- **TC Meeting #5 (February 26, 2014):** The fifth TC meeting presented the Public Draft JLUS and Background Report to the committee members. An overview of the previous night's public forum in Frederick was discussed and details for the Wichita Falls public forum occurring in the evening were provided.

Public Forums



Frederick Public Forum #1, May 7, 2013



Wichita Falls Public Forum #2, August 27, 2013

In addition to the PC and TC meetings, a series of public forums were held throughout the development of the JLUS. These forums provided an opportunity for the exchange of information with the greater community, assisted in identifying the issues to be addressed in the JLUS, and provided input on the

strategies proposed. Each forum included a traditional presentation and a facilitated exercise providing a “hands on,” interactive opportunity for the public to participate in the development of the plan. The public forums conducted are highlighted as follows:

- **Public Forum #1 (January 29, 2013 – Wichita Falls, TX, and May 7, 2013 – Frederick, OK):** There were two kick-off public forums held at different times for the two JLUS sub-study areas. One was held in the City of Wichita Falls at the Multi-Purpose Events Center (MPEC) and the other was held in the City of Frederick at the Great Plains Technology Center. At these forums, the JLUS project and purpose were presented and discussed with the residents of the communities within the Sheppard AFB Study Area (Wichita Falls) and the Frederick Regional Airport Study Area (Frederick), and the 23 standard compatibility factors were introduced. Then attendees were asked to identify specific compatibility issues they believed should be addressed.
- **Public Forum #2 (August 27, 2013 – Wichita Falls, TX, and August 29, 2013 – Frederick, OK):** The second set of public forums presented the compatibility issues to the public, and an interactive exercise took place that encouraged attendees to prioritize the issues by high, medium, low, on-going, or awareness, depending on how much impact the issue has between military operations and the communities. Some additional discussion occurred to revise or update some of the issues.
- **Public Forum #3 (February 25, 2014 – Frederick, OK and February 27, 2014 Wichita Falls, TX):** The last public forum presented the Public Draft JLUS to the communities and citizens to provide an overview of the document. The forum allowed the public an opportunity to provide feedback and input to be considered and incorporated into the Final JLUS. The Public Draft JLUS was made available on the project website for download before the forum was held.

Public Outreach Materials

Fact Sheet: At the beginning of the JLUS project, a Fact Sheet was developed describing the JLUS program, objectives, methods for the public to provide input into the process, an overview of the 23 compatibility factors that would be analyzed throughout the project, and the proposed Sheppard AFB JLUS Study Area. This Fact Sheet was made available at the forums for review by interested members of the public, as well as posted on the website for download.

Strategy Tools Brochure: The Strategy Tools Brochure was prepared for the second set of public forums. JLUS strategies constitute a variety of actions that local governments, military installations, agencies, and other stakeholders can take to promote compatible land use planning. This brochure provides an overview of the strategy types that could be applied to address compatibility issues around Sheppard AFB.

Website: A project website was developed and maintained to provide stakeholders, the public, and media representatives with access to project information. This website was maintained for the entire duration of the project to ensure information was easily accessible. Information on the website included program points of contact, schedules, documents, maps, public meeting information, and downloadable comment forms.

Sheppard AFB JLUS - Public Draft

The links below provide access to the Public Draft documents that make up with Sheppard AFB JLUS. These documents are being released on February 14, 2014 for public review and comment as part of a 30-day review period that will end on March 17, 2014.

The contact person for this project is Kevin Hugman, Wichita Falls Assistant City Manager. Comments can be mailed to the City of Wichita Falls office (1300 7th Street, Room # 400, P.O. Box 1431 Wichita Falls, TX 76707) or emailed to Mr. Hugman ([click here for e-mail](#)) no later than midnight on March 17, 2014. Comments may also be sent via FAX at 940-761-7419 by the same time and date noted.

In order to develop a plan that is responsive to local needs, input from the community is critical. You are encouraged to join us at one or both forums listed below to provide your questions, comments, or concerns on the Public Draft JLUS.

Click here to download the JLUS Report.

- The is the main JLUS document, and provides a summary of key findings, areas affected, and recommended strategies.

What's New

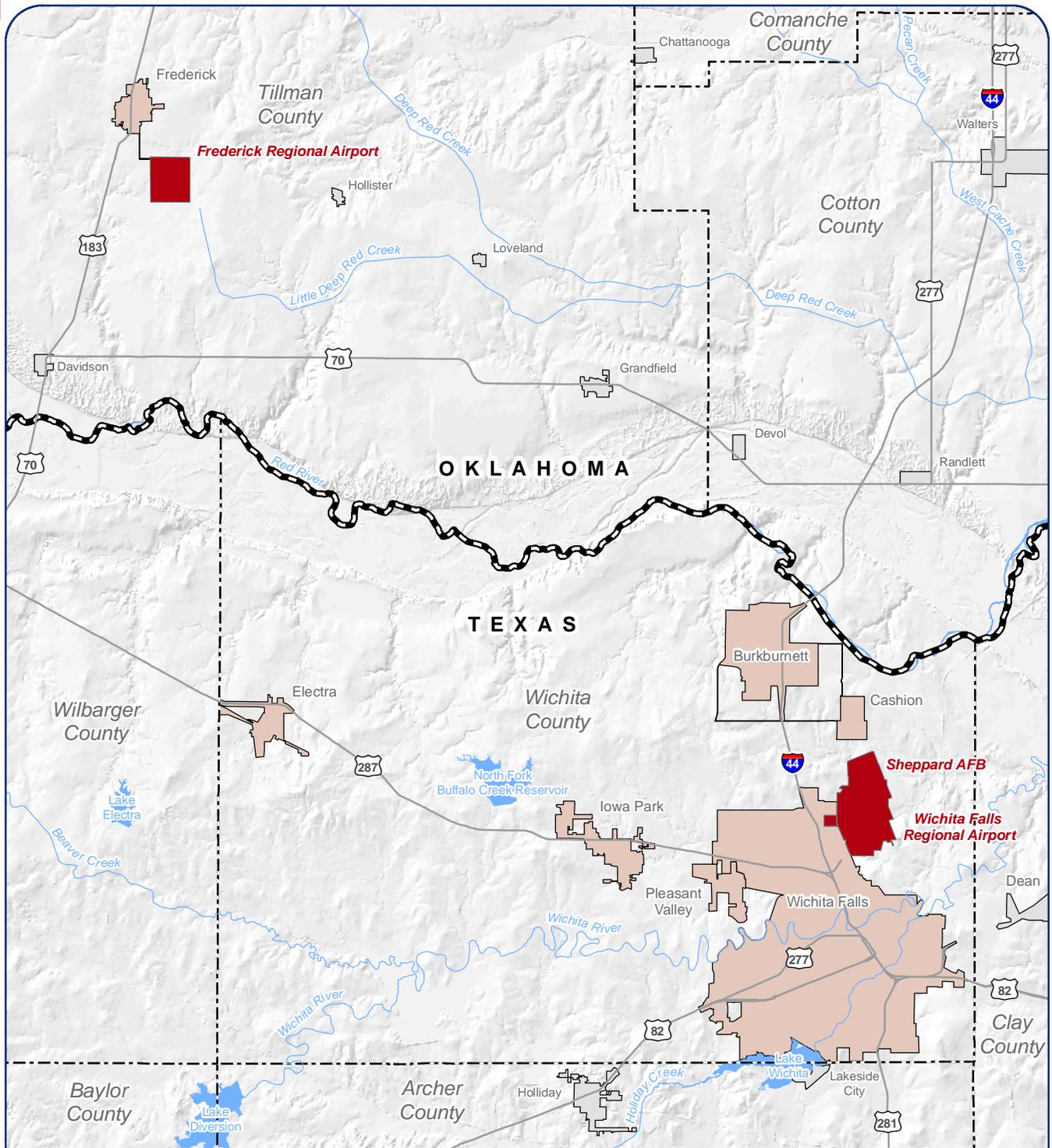
- Public Forum 3 – Wichita Falls, TX (February 27, 2014)
- Public Forum 3 – Frederick, OK (February 25, 2014)
- Sheppard AFB JLUS - Public Draft

For More Information

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1.4 JLUS Study Areas

The Sheppard AFB regional JLUS Study Area is designed to address all lands near Sheppard AFB and Frederick Regional Airport that may impact current or future military operations or be impacted by operations. Since the JLUS has been developed for two specific geographic locations, there are two distinct sub-study areas within the overall Study Area: the Sheppard AFB Study Area includes Wichita County and the cities of Wichita Falls, Burkburnett, Cashion Community, Electra, and Iowa Park, and the Town of Pleasant Valley in Texas. The Frederick Regional Airport Study Area covers portions of Tillman County and the City of Frederick in Oklahoma. The primary characteristics evaluated in determining the study areas were general compatibility factors associated with military mission readiness and land uses such as heights of structures, safety, and / or noise and vibration. Figure 1-2 illustrates the entire Sheppard AFB JLUS Study Area, while Figures 1-3 and 1-4 represent the Sheppard AFB and Frederick Regional Airport sub-study areas, respectively.



Legend

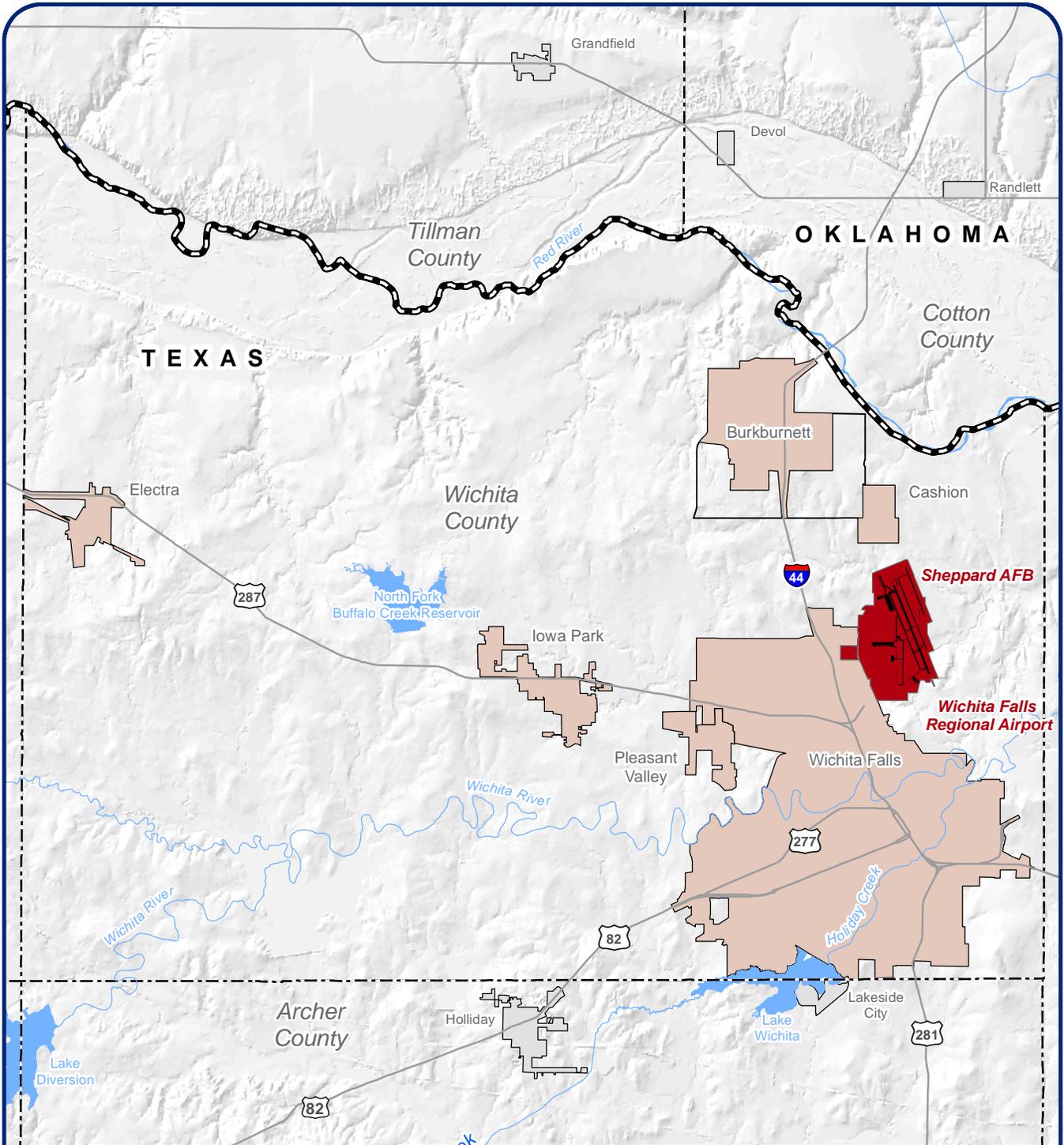
- Facilities Covered by JLUS
- Other Community
- State
- County
- Community Covered by JLUS
- Highway
- River
- Water Body



0 3 6 Miles

Sources: City of Wichita Falls, 2012; TNIRIS, 2012; OCGI, 2012.

**Figure 1-2
Sheppard AFB JLUS Regional Study Area**



Legend

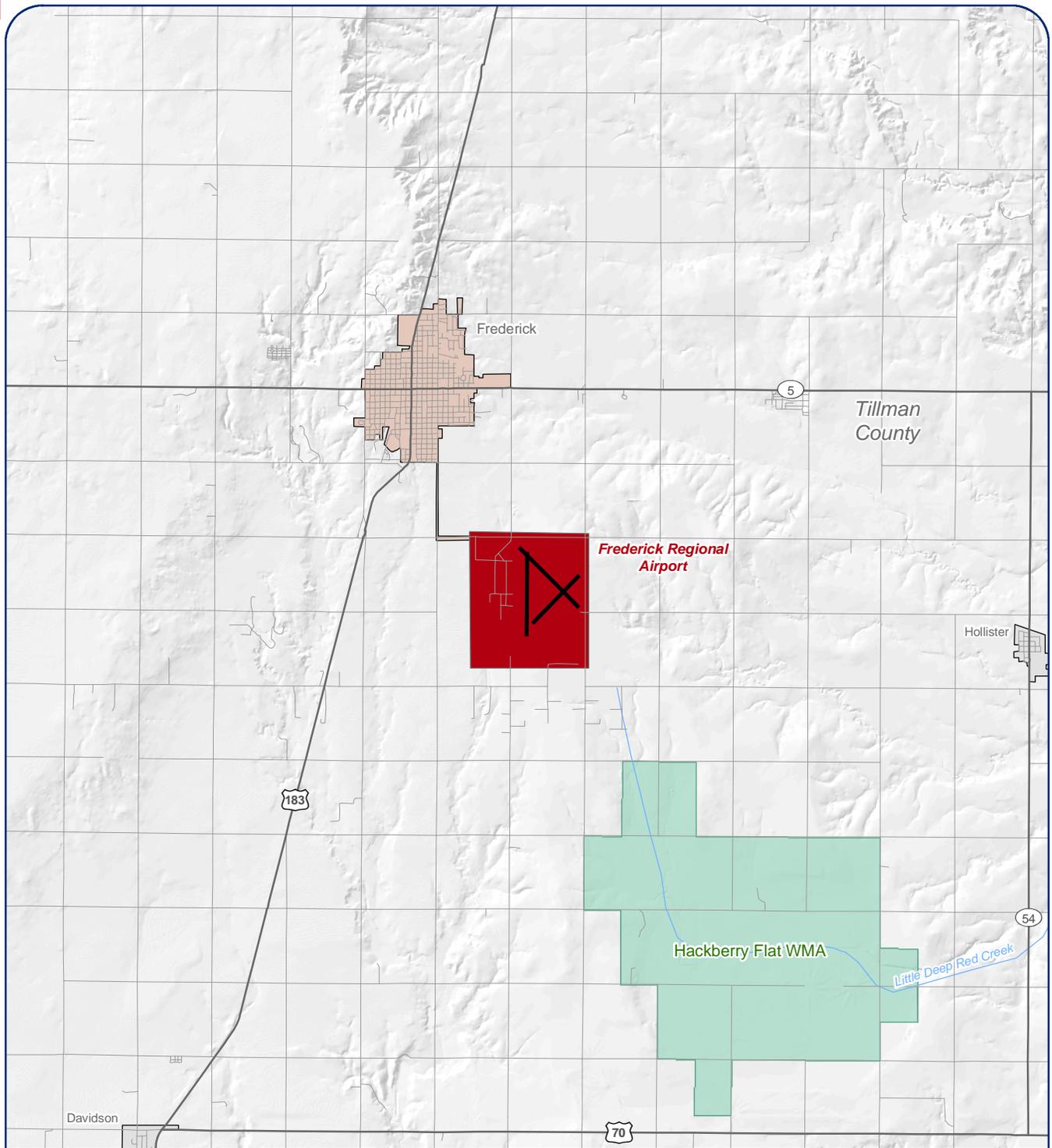
- Sheppard AFB
- State
- County
- Community Covered by JLUS
- Other Community
- Airfield Surface / Runway
- Water Body
- Highway
- River



0 1 2
Miles

Sources: City of Wichita Falls, 2012; OCGI, 2012.

Figure 1-3
Sheppard AFB Study Area



Legend

- Frederick Regional Airport
- Community Covered by JLUS
- Other Community
- Hackberry Flat WMA
- Highway
- Road
- Airport Runway
- River



0 1 2 Miles

Sources: City of Wichita Falls, 2012; OCGI, 2012.

**Figure 1-4
Frederick Regional Airport Study Area**

1.5 JLUS Organization

The following is a brief overview of the organization of the Sheppard AFB JLUS, including the contents of the main JLUS Report and each of the chapters of the Background Report.

JLUS Report

The JLUS Report is a high-resolution graphic portfolio of the key issues and strategies identified in the Sheppard AFB JLUS. The report provides a user-friendly reference of the JLUS that is accessible and easy-to-use for all stakeholders. This report provides a brief discussion on the purpose and objectives of a JLUS, describes the benefit of a JLUS, and provides an overview of the various JLUS partners that assisted in developing the Sheppard AFB JLUS to be a useful tool for all affected jurisdictions. Finally, this document outlines the relevant compatibility issues accompanied by relevant strategies identified in this JLUS and provides summaries of the strategies separated by jurisdiction.

Background Report

Chapter 1: Introduction: Chapter 1 provides an introduction and overview of the Sheppard AFB JLUS. This chapter describes the strategic and local importance of Sheppard AFB, the working relationships among the entities, the background and intent of the JLUS, the Study Area, the objectives used to guide development of the JLUS, the stakeholders involved in developing the JLUS, public outreach methods, implementation premise, and the organization of the document.

Chapter 2: Community Profile: This chapter introduces the communities that are within the JLUS Study Area and gives an overview of their history and current statistics, including population, housing characteristics, economic outlook, and past, present, and future trends of growth and development. The chapter also discusses an overview of the transportation system within the JLUS Study Area.

Chapter 3: Military Profile: The military profile chapter discusses the military presence and activities that take place within the JLUS Study Area. This chapter is broken into two sections, one which discusses Sheppard AFB and one which discusses the military presence at Frederick Regional Airport. For each installation, an overview of the military facilities is discussed, as well as the military

operations that take place there. A brief history and the economic impact of each installation on the surrounding communities are also presented.

The discussion for Sheppard AFB also includes information on the units and schools that operate out of the base. It is important to identify the military operating areas and current and possible future missions that take place in the Study Area to get an idea of how the military operations could potentially impact, or be impacted by, the surrounding communities.

Chapter 4: Existing Compatibility Tools: This chapter provides an overview of relevant plans, programs, and studies that are tools to address compatibility issues in the JLUS Study Area. The applicable tools are reviewed in order to set a baseline outline for the evaluation of the effectiveness of each existing plan or program relative to addressing compatibility issues, as identified and described in Chapter 5.

Chapter 5: Compatibility Assessment: Compatibility, in relationship to military readiness, can be defined as the balance or compromise between community needs and interests and military needs and interests. In this chapter, the JLUS presents the compatibility issues identified for the Sheppard AFB JLUS for the Sheppard AFB Study Area and the Frederick Regional Airport Study Area. These issues were identified based on input from the PC and TC, members of the public, existing plans and technical reports, and evaluation by the project team.

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CHAPTER 2: COMMUNITY PROFILE

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This chapter provides important information about the civilian entities within the Sheppard Air Force Base (AFB) Joint Land Use Study (JLUS) Study Area. The Study Area for this JLUS includes Sheppard AFB and its surrounding communities, and the auxiliary airfield at Frederick Regional Airport and the City of Frederick. For ease of discussion, the Study Area is broken down into two sub-study areas. The Sheppard AFB Study Area include the installation itself and its neighboring communities in Wichita County, City of Burkburnett, Cashion Community, City of Electra, City of Iowa Park, City of Wichita Falls, and the Town of Pleasant Valley. The Frederick Regional Airport Study Area covers Frederick Regional Airport, the City of Frederick and portions of Tillman County, Oklahoma. These study areas are discussed and shown on maps in Chapter 1.

2.1 Sheppard AFB Study Area Community Profile 2-2

History and Profile 2-2

Wichita County..... 2-2

City of Burkburnett..... 2-3

City of Cashion Community 2-4

City of Electra 2-4

City of Iowa Park..... 2-4

Town of Pleasant Valley 2-5

City of Wichita Falls 2-5

Study Area Growth Trends 2-6

Population..... 2-6

Housing Trends 2-9

Median Monthly Gross Rent 2-10

Housing Value Trends 2-10

Military Housing 2-10

Economic Development..... 2-11

Transportation..... 2-12

2.2 Frederick Regional Airport Study Area ... 2-14

History and Profile 2-14

Study Area Growth Trends 2-14

Population..... 2-14

Housing Trends 2-15

Housing Value Trends 2-15

Economic Development..... 2-18

Transportation..... 2-18

2.1 Sheppard AFB Study Area Community Profile

History and Profile

Wichita County



Wichita County Courthouse

Wichita County covers 606 square miles of land in the north central portion of Texas along the Oklahoma border. The 2010 population of the county was approximately 131,500 people, which remains steady from the 2000 Census. The largest city, and county seat, is Wichita Falls.

The county is the historic home of the Caddoan Indians, principally the Wichitas and Taovayas, who were relocated to reservations north of the Red River in the mid-1800s. Wichita County was established by the Texas legislature on February 1, 1858 from the Cooke Land District. The area was named after the Wichita Indians and originally attached to Clay County for judicial purposes. Through the 1880s, Wichita County remained overwhelmingly rural with agriculture comprising the main economic activity, corn and hay being the leading crops. Development was spurred when the expanding Fort Worth and Denver City Railroad reached the tiny settlement of Wichita Falls in September 1882. This ensured the continued existence of Wichita Falls, and the town adopted the date of the arrival of the first train, September 26, 1882, as its birthday.

Rail and water improvements brought development to the area, which experienced substantial growth through the discovery of oil in the early 1900s. By 1918, following major discoveries near the community of Burkburnett, the county found itself in the midst of a

full-scale oil boom which would last through the 1950s. The county seat became the center of economic growth as a number of petroleum-related businesses, including oil field product manufacturing, crude oil refining, stock sales, and related endeavors, began operations. By 1940, the county had become Texas' most productive and active oil county.

The Great Depression and World War II brought population declines as farming and cattle grazing experienced significant downturns; however, war industries increased the demand for oil and introduced manufacturing jobs to the region. The establishment of an Army Air Corps training facility just north of the county seat, which would become Sheppard Air Force Base, had a lasting effect on the local economy.

Post war growth saw steady population increase from 73,604 in 1940 to 123,528 in 1960, and then remained virtually unchanged, increasing slightly up to the present day. Wichita Falls continued to serve as the focal point of the local economy, with diversified manufacturing and commercial activity, medical services, Sheppard Air Force Base, and the county government serving as major economic drivers. Despite a depression in the oil business during the mid-1980s, oil production remained an important segment of the economy.

Wichita County utilizes a Commissioners' Court form of government. The job of the county commissioner calls for hands-on service delivery as well as policy-making budget decisions. Four commissioners, each elected from a quarter of the county's population, serve along with the county judge on the commissioners' court.

City of Burkburnett



Downtown Burkburnett

The City of Burkburnett is situated in the northern most reaches of Wichita County, just south of the Texas-Oklahoma state line. It is approximately 12 miles due north of Wichita Falls and accessible via Interstate 44 / US Highway 277.

The site was originally settled by ranchers as early as 1856, and received its name from Samuel Burk Burnett, a wealthy rancher and developer in the area. The city was officially established on June 6, 1907, and remained a significant ranching site until the discovery of oil in 1912. By 1918, approximately 23,000 people had located to the area to work the abundant oil fields. The town lost many of its residents with the downturn of the Great Depression, but recovered after the war with the continued presence of Sheppard AFB. The 2010 population of Burkburnett stood at 10,811, which is almost unchanged compared to the 2000 census population of 10,927.

The City of Burkburnett is a home-rule municipality. The governing body is composed of seven City Commissioners who are elected by the citizens at-large, rather than by district. The City Commissioners serve staggered two-year terms, with four City Commissioners elected during even-numbered years and three City Commissioners elected during odd-numbered years. The City Commissioners are charged with electing the Mayor from among the City Commissioners, and appointing or reappointing the City Manager. The Mayor is the traditional public figurehead of the city, while the City Manager is responsible for the day-to-day operations within the city government.

City of Cashion Community



Cashion City Hall

The City of Cashion Community, often referred to simply as Cashion, is eight miles north of Wichita Falls, off State Highway 240.

Settlement in the area began around 1897 and a one-room schoolhouse was built on donated land and named for T.J. Cashion, a County Commissioner. The school became the center of the community which experienced an oil boom and population increase during the 1920s. Oil production decline in the 1930s, coupled with the Great Depression, resulted in a population drop in the area.

The community was incorporated in 2000 as a Type C General-Law Municipality and adopted a commission form of government with a Mayor and three Council members. It reported a population of 550 residents at the time of incorporation, which are 202 more than its 2010 census population of 348.

City of Electra



Electra Water Tower

The City of Electra is less than 30 miles west of Wichita Falls, off US Highway 287. The area was first settled as a ranching community in 1852. A town grew around the local railroad station, which attracted farmers to the area. Oil was discovered in April 1911,

and the population increased fourfold over a period of a few months. By the 1930s, Electra had well over 6,000 residents; however, like many cities in the region, it experienced a significant decrease in population in the late post-war years, and by 2000, Electra's population dropped to 3,168 (2000 census). The population of Electra continued to drop and was reported as 2,791 in the 2010 census.

The City of Electra is a Home Rule City, with full services available to its citizens. The five member City Commission is elected to two-year staggered terms. The City Commission appoints the City Administrator, City Secretary, City Attorney and Chief of Police. The City Administrator is the Chief Executive Officer of the city responsible for day to day operations.

City of Iowa Park



Lake in Iowa Park

The City of Iowa Park is approximately 10 miles west of Wichita Falls, off US Highway 287.

Iowa Park was founded in 1888 alongside the tracks of the Fort Worth and Denver City Railway, and soon became a shipping point for cotton and wheat. The population declined during the early part of the century, but an oil discovery in 1918 reversed the trend. A concrete highway connecting Iowa Park with Wichita Falls was built in 1927, which helped Iowa Park retain its population while most other towns experienced declines due to the Great Depression.

Sheppard AFB provided an infusion to the population in the 1950s, which has held steady ever since. The 2000 census reported a population of 6,431, while the 2010 census showed a slight decrease to 6,312.

Iowa Park employs a Home Rule municipal government in order to promote economic and cultural prosperity, provide for the common welfare, insure health and safety, and support municipal cooperation.

The governing body of the City is a City Council and consists of a Mayor and five Council members. The Mayor and Council members are elected by the qualified voters of the entire City for a term of two years, or until a successor has been duly elected and qualified, but each Council member shall be elected to and occupy an at-large, nongeographic place on the City Council. The City Council appoints a City Manager who is responsible to the City Council for the management and administration of the offices of the City, except as otherwise provided by the Charter Council.

Town of Pleasant Valley



Pleasant Valley Baptist Church

The Town of Pleasant Valley is approximately 8 miles west of Wichita Falls, off US Highway 287.

Development of the community where Pleasant Valley is currently situated began in the late 1880s, when a one-room schoolhouse that also served as a church began operating. Pleasant Valley served as a school community well into the twentieth century. As nearby Wichita Falls expanded in the late 1950s and early 1960s, residents of Pleasant Valley decided to protect their town's separate identity and avoid annexation by incorporating. On January 11, 1962, Pleasant Valley incorporated, selecting a Mayor-Council form of city government to serve its 200 residents.

By the mid-1970s the town had a population of over 300 for the first time in its history. Most residents were farmers, although a growing percentage commuted to jobs in Wichita Falls. In 2000, the population was 408, but has since dropped to 336 (2010 census).

City of Wichita Falls



Downtown Wichita Falls

The land where the City of Wichita Falls is located was purchased in the early 1800s, but not platted for development until July 1876. The original town was established along the Wichita River and included a small waterfall on the river (which later washed away), a town square, and several named streets. As permanent settlers began to occupy the area, a post office was established in 1879 and the first public school opened in 1880, followed by the First Methodist Church the next year.

During the early 1880s, residents of Wichita Falls persuaded the Fort Worth and Denver Railway Company to bring their railway through the area, with the first trains arriving in September 1882. This triggered a boom in the sale of town lots and the establishment of significant industries including the first lumberyard and a shingle and sorghum mill which were also established the same year. In November 1883, Wichita Falls became the county seat of Wichita County, and on July 29, 1889, it was officially incorporated.

Construction of additional railroads and the presence of several railway companies, including the Wichita Valley Railroad, the Wichita Falls Railway, the Wichita Falls and Southern Railway, the Wichita Falls and Oklahoma Railway, and the Wichita Falls and Northwestern, established Wichita Falls as a regional transportation and distribution center. Its population increased from 2,480 at the turn of the century to 8,200 by 1910. Population growth brought a need for more water, and several significant water projects over the next fifty years expanded the water supply to meet population needs.

In 1903, oil was discovered east of Wichita Falls in Clay County. Over the next couple decades, oil became a big business in the region and shifted the economic drivers for Wichita Falls. By 1920, there

were nine refineries and 47 factories in Wichita Falls. The oil boom was accompanied by a building boom that spurred further growth of the city. Call Field, an Army Air Corps training facility, was built south of the city during World War I. The area continued to grow; by 1920 it had a population of 40,079, and by 1930 a population of 60,000, which was 80 percent of the county's total population. Airline passenger service was established in Wichita Falls in 1928.

In the 1960s, decreased oil production caused a drop in population. The 1960 population was 101,724, down from 110,100 just five years earlier. The city's leadership formed Industrial Development, Incorporated as a means to diversify the economy by attracting other types of industries. This prompted companies such as Gates Rubber Company, Sprague Electric, Johnson and Johnson, Tex-Color Labs, Town and Country Mobile Homes, and Dowell Division of Dow Chemical Company to establish operations in the area. Growth continued until the 1980s when some of the companies moved away from Wichita Falls, including Johnson and Johnson and Sprague.

Wichita Falls operates under a Council-Manager form of government. This system combines the strong political leadership of elected officials, in the form of a City Council, with the strong managerial experience of an appointed City Manager. The Council-Manager form of government establishes a representative system where all power is concentrated in the elected Council and the Council hires a professionally trained manager to oversee the delivery of public services. The City of Wichita Falls has a Mayor and six member Council elected in non-partisan elections. Their terms of service are for two years.

The 2010 population of Wichita Falls was 104,553, virtually unchanged from the 1960 population of 101,724.

Study Area Growth Trends

The following section provides a profile of the Texas component of the study area's population growth, housing growth, and median home values. This information assists in setting the regional context and growth potential for the JLUS. The Oklahoma overview follows the information on Texas.

Population

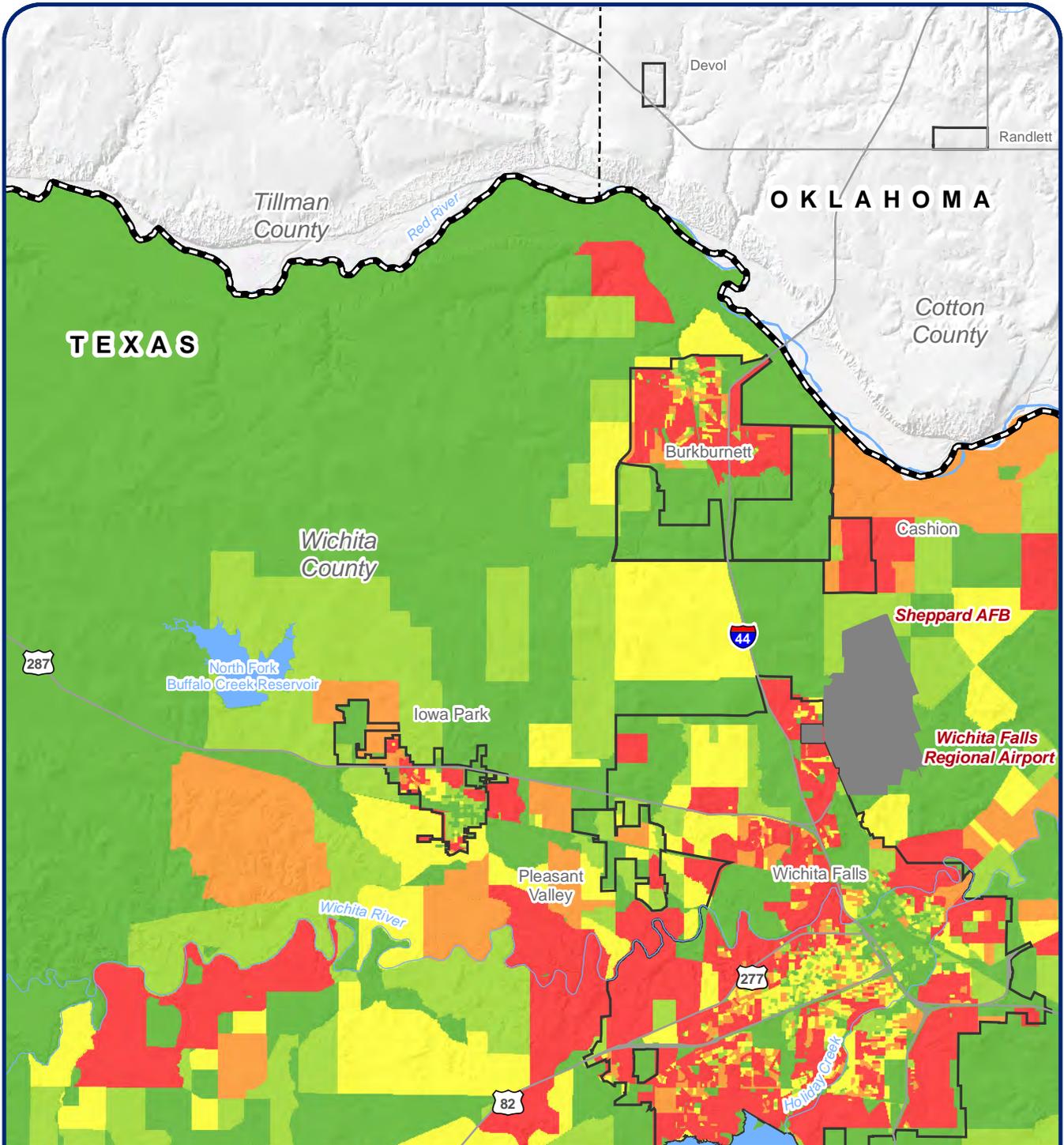
The population information used is based on 2000 and 2010 US Census data, in addition to the 2007-2011 American Community Survey. Population projections show the overall trends in population change in the area and assist policymakers in making informed decisions based on these prevailing tendencies. The following information provides an overview of the changes in population in the Sheppard AFB JLUS area in the ten year period 2000 to 2010. Figures 2-1 and 2-2 also show the locations of population densities around Sheppard AFB for the years 2000 and 2010, respectively.

Between 2000 and 2010, the State of Texas experienced a significant population increase, which is expected to continue for the foreseeable future. However, most communities in the study area experienced decreases in population during this time. Table 2-1 shows the population changes in Wichita County and its cities compared with the State of Texas from 2000 to 2010.

Table 2-1. Wichita County Population, 2000-2010

Jurisdiction	2000	2010	Number Change	Percent Change
Texas	20,851,820	25,145,561	4,293,741	20.6%
Wichita County	131,664	131,500	-164	-0.1%
City of Burkburnett	10,927	10,811	-116	-1.06%
City of Cashion Community	346	348	2	<0.1%
City of Electra	3,168	2,791	-377	-11.9%
City of Iowa Park	6,431	6,355	-76	-1.18%
Town of Pleasant Valley	408	336	-72	-17.65%
City of Wichita Falls	104,197	104,553	356	0.3%

Sources: 2000 and 2010 US Census data



Legend

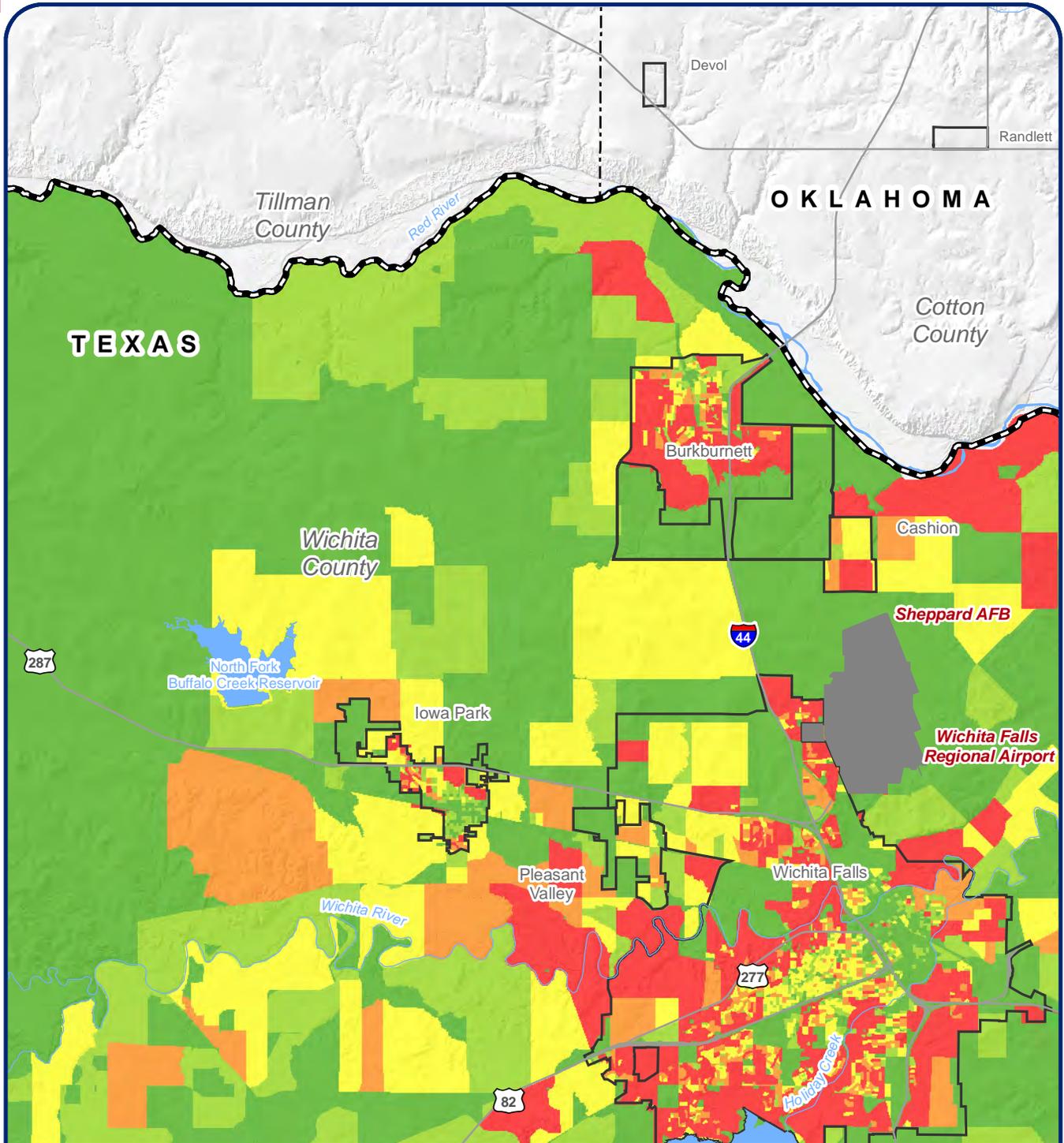
- | | | | |
|----------------------------|---------|--------------|------------|
| Population Per Square Mile | 26 - 50 | Sheppard AFB | Highway |
| 0 - 10 | 51 - 75 | State | River |
| 11 - 25 | > 75 | County | Water Body |
| | | Community | |



0 1 2 Miles

Sources: City of Wichita Falls, 2012; TNRIS, 2012; OCGI, 2012.

**Figure 2-1
Wichita County Population Density, 2000**



Legend

Population Per Square Mile	26 - 50	Sheppard AFB	Highway
0 - 10	51 - 75	State	River
11 - 25	> 75	County	Water Body
	Community		



0 1 2 Miles

Sources: City of Wichita Falls, 2012; TNRS, 2012; OCGI, 2012.

**Figure 2-2
Wichita County Population Density, 2010**

The City of Wichita Falls is the largest populated city in Wichita County, and continues to account for nearly 80 percent of the county's population. While no significant population changes took place in the study area, because of the rural nature of cities such as Iowa Park and Electra, the relatively small numbers of people moving out of the cities have large effects on the small populations. Overall, the county experienced a slight loss in population, but has remained relatively stable over the study period.

Future population projections, as shown in Table 2-2, indicate a slow, steady growth outlook of 14.6 percent for Wichita County through the 40-year planning period. Most of this growth is anticipated to occur in the Wichita Falls-Burkburnett-Iowa Park area due to the availability of essential services, infrastructure, and housing. These population projections were provided by the Texas State Data Center and were the only projections available for the study area at the time the JLUS was created. Since the 2010 population of Wichita Falls was 104,553, virtually unchanged from the 1960 population of 101,724, it is likely that the populations in Table 2-2 will not increase to the levels forecasted.

Table 2-2. Forecasted Population in Wichita County, 2010-2050

Year	Population
2010	131,500
2020	137,104
2030	142,792
2040	147,397
2050	150,772

Source: Texas State Data Center, Office of the State Demographer

Housing Trends

Housing trends are an important indicator of economic activity and vitality because they capture the changes in housing types as well as growth from new housing construction. These values can also be used to study affordability with various housing options, including renting, which can have significant impacts on Sheppard AFB as military personnel must compete with local rental markets for off-base housing. Furthermore, housing trends can potentially indicate future development and types of residential development to come. The following information explores the housing market trends in the study area, looking at indicators such as new residential building

permits, median home values, and median rental costs for Wichita County and the jurisdictions found in it. Table 2-3 shows the number of housing units within the various jurisdictions according to the 2010 Census.

Table 2-3. Existing Housing Stock in 2010

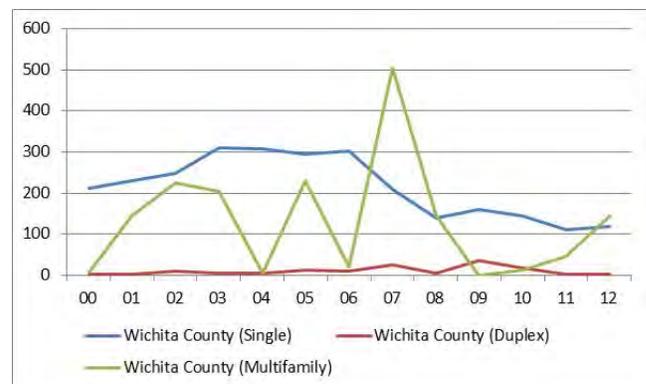
Jurisdiction	Housing Units
Wichita County	55,566
City of Burkburnett	4,676
City of Cashion Community	138
City of Electra	1,426
City of Iowa Park	2,794
Town of Pleasant Valley	154
City of Wichita Falls	43,632

Source: US Census 2010

Building Permits

An analysis of the number of building permits issued can also be a good indicator of the growth of a community. However, it should be noted that not all of the jurisdictions in the Study Area issue building permits. Figure 2-3 illustrates the number and type of building permits filed in Wichita County between 2000 and 2012.

Figure 2-3. Building Permits in Wichita County 2000-2012



Source: US Census 2000-2012

Housing construction trends in the study area experienced the effects of the national recession and housing value loss which began in 2007 and is only beginning to recover. Overall, the relatively slow growth seen in new housing follows the tepid population growth seen throughout the county.

Median Monthly Gross Rent

The cost of local rent and the rates of change is a significant factor to consider in local affordable housing available for both local residents and military personnel assigned to Shepard AFB. The data given in Table 2-4 shows the changes in the median rental costs in jurisdictions in the study area between 2000 and the annual estimate for the years 2008 to 2012.

Table 2-4. Median Monthly Gross Rent in Surrounding Jurisdictions, 2000-2012

Jurisdiction	2000	2008-2012 Estimate
Texas	\$574	\$834
Wichita County	\$486	\$723
City of Burkburnett	\$487	\$721
City of Cashion Community	N/A	\$446
City of Electra	\$370	\$616
City of Iowa Park	\$503	\$873
Town of Pleasant Valley	\$543	\$750
City of Wichita Falls	\$489	\$720

Source: US Census 2000; American Community Survey, 2008-2012

The information given shows a substantial increase in the median rent throughout all jurisdictions in the study area. While the 2008-2012 value is only an estimate, it offers an important insight into the changing trends of affordable rental properties in the study area. These values are important to consider with military BAH when examining available housing for military personnel.

Housing Value Trends

Housing value trends can potentially indicate the change in land and home values relative to market fluctuations. These fluctuations can be indicative of development activity, and represents another significant aspect of population movements, economic activity, and housing affordability for a region or jurisdiction. Table 2-5 reports the median housing value trends for owner-occupied housing units in the JLUS area from 2000 to 2012.

Table 2-5. Median Housing Values, 2000-2012

Jurisdiction	2000	2008-2012 Estimate
Texas	\$82,500	\$128,000
Wichita County	\$61,500	\$89,600
City of Burkburnett	\$63,000	\$89,500
City of Cashion Community	N/A	\$114,400
City of Electra	\$28,400	\$38,500
City of Iowa Park	\$55,000	\$81,200
Town of Pleasant Valley	\$68,600	\$104,400
City of Wichita Falls	\$62,700	\$91,300

Source: US Census 2000; American Community Survey, 2008-2012

Military Housing

The Base Allowance for Housing (BAH) is a stipend given to uniformed soldiers to augment the cost of living such as renting a home or an apartment, utilities, and renter's insurance. The BAH for Sheppard AFB are provided in Table 2-6.

Table 2-6. Sheppard AFB BAH 2013

Rank	Without Dependents	With Dependents
E-1	\$750	\$1002
E-2	\$750	\$1002
E-3	\$750	\$1002
E-4	\$750	\$1002
E-5	\$849	\$1098
E-6	\$918	\$1182
E-7	\$1017	\$1356
E-8	\$1158	\$1545
E-9	\$1281	\$1710
W-1	\$966	\$1185
W-2	\$1113	\$1434
W-3	\$1284	\$1665
W-4	\$1305	\$1725
W-5	\$1398	\$1797
O-1E	\$1098	\$1395
O-2E	\$1224	\$1632
O-3E	\$1302	\$1737
O-1	\$906	\$1107

Table 2-6. Sheppard AFB BAH 2013 (cont.)

Rank	Without Dependents	With Dependents
O-2	\$1065	\$1179
O-3	\$1287	\$1656
O-4	\$1374	\$1824
O-5	\$1485	\$1938
O-6	\$1665	\$1959
O-7	\$1698	\$1977

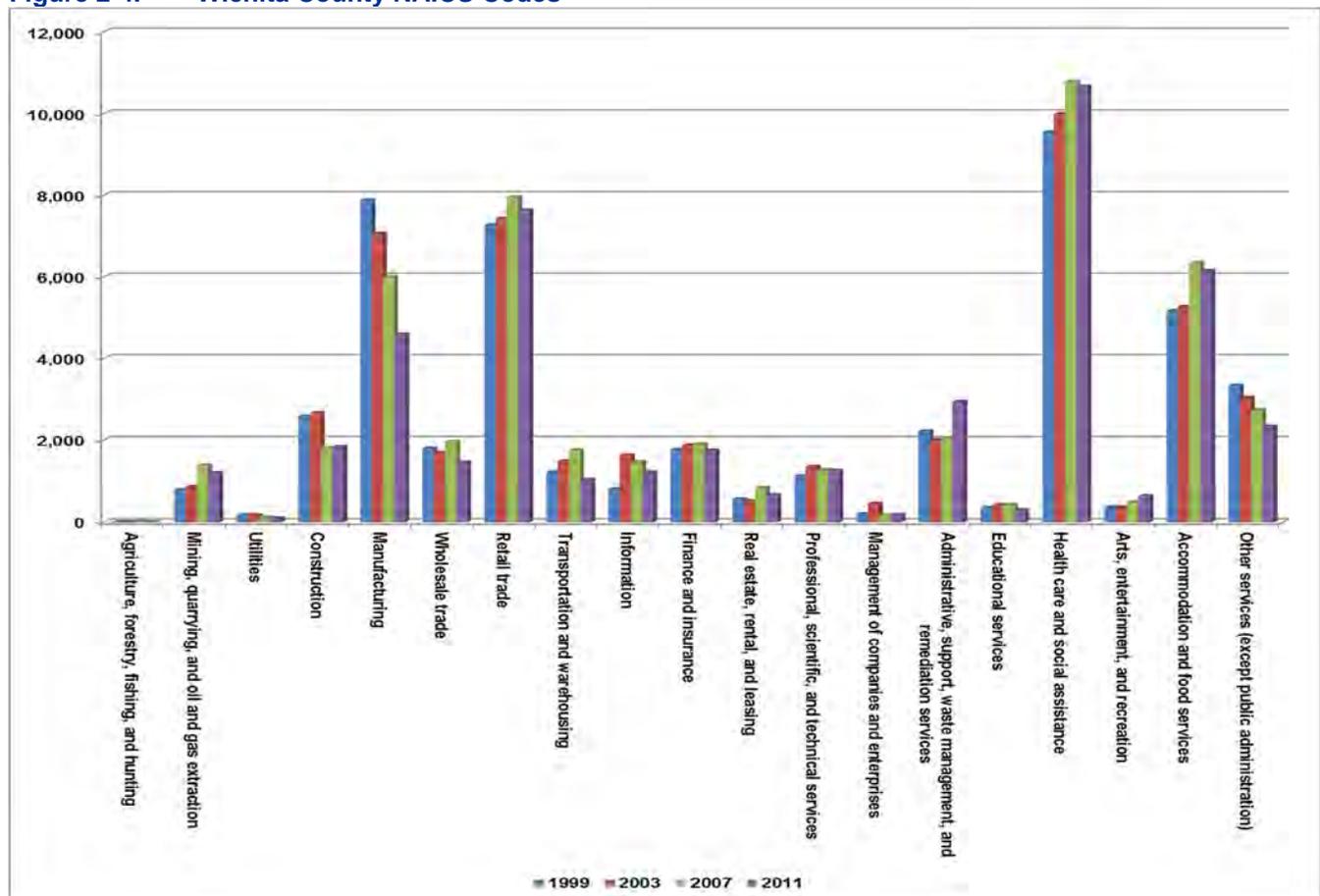
Source: *Sheppardhousing.com/bah.php*

The BAH for Sheppard AFB is determined by pay grade, local area rental market, and dependency status. When comparing current BAH rates to median rental prices around Sheppard AFB, it is evident that affordability is not an immediate concern for military personnel stationed at the installation. Furthermore,

because of the brief training periods often associated with assignments to Sheppard AFB, there may not be extensive demands on the local rental market from military personnel for housing.

Economic Development

According to the North American Industry Classification System (NAICS), which classifies business establishments to collect, analyze, and publish statistical data related to the US economy, the major industries in Wichita County are healthcare, manufacturing, accommodation and food services, and retail. Figure 2-4 illustrates the trends in employment industries between the years of 1999 to 2011. As the figure shows, of the four major industries, manufacturing has experienced a significant decline during this time period.

Figure 2-4. Wichita County NAICS Codes

Source: *US Census Bureau*

While employment trends reflect the recent national economic recession, several general trends show growth in the healthcare and retail industries, while manufacturing, which has been a longtime source of employment with the oil industry, has been on a steady decline in recent years. This is reflected in the major employers in the region, such as Sheppard AFB, the North Texas State hospitals, United Regional Healthcare System, Howmet Corp. WS Casting Division, Work Services Corp., and Lear Siegler Service Inc., which are among the largest employers in the county.

Table 2-7 provides the median household income in each of the study area communities. This information reveals that incomes are increasing consistently throughout the study area.

Table 2-7. Median Household Income Change, 2000-2012

Jurisdiction	2000	2008-2012 Estimate	Number Change	Percent Change
Texas	\$49,279	\$51,563	\$2,284	4.6%
Wichita County	\$40,937	\$45,589	\$4,652	11.4%
City of Burkburnett	\$41,579	\$50,446	\$8,867	21.3%
City of Cashion Community	N/A	\$73,472	N/A	N/A
City of Electra	\$27,546	\$37,163	\$9,617	34.9%
City of Iowa Park	\$44,075	\$48,019	\$3,944	8.9%
Town of Pleasant Valley	\$44,286	\$52,500	\$8,214	18.5%
City of Wichita Falls	\$41,588	\$44,390	\$2,802	6.7%

Source: US Census 2000, Historical Census of Housing Tables, American Community Survey 2008-2012

Transportation

The major federal highways in Wichita County include Interstate 44, US Highways 82, 277, 281 and 287. The primary State Highways include 25, 79, 240 and 258 (see Figure 2-1). These highways connect the county to points north in Oklahoma across the Red River including Oklahoma City and south, to the Dallas-Fort Worth area and other cities in Texas.

Within the JLUS regional study area, there is one scheduled commercial service airport, the Wichita Falls Regional Airport, located on Sheppard AFB five miles north of the downtown business district. The airport is joint use in that the runways and taxiways that serve it are operated by and shared with Sheppard Air Force Base. Since runways are owned by Sheppard AFB, the majority of the flight activity associated with them is military aircraft. There are currently four commercial passenger flights per day arriving and departing from Wichita Falls Regional Airport.

There are six general aviation airports of note within the study area, (see Figure 2-5). There is also a general aviation airport in Oklahoma just north of Wichita County that is located between Sheppard AFB and Frederick Regional Airport. The general aviation airports in the region are:

- Wichita Valley Airport is located in Pleasant Valley, eight miles northwest of Wichita Falls. It offers 24-hour self-service fuel, hangars and tie downs.
- Kickapoo Downtown Airport, located in southeast Wichita Falls, is a city-owned public use airport located 3.5 miles south of the central business district with one runway.
- The Lucky G Airport is a privately owned grass landing strip located in Holliday, Texas and is southwest of Wichita Falls off Kell Boulevard (US Highways 82 and 277).
- Cactus Hill Airport is a grass landing strip located west-southwest of Wichita Falls, is privately owned and has only 1 single engine aircraft based there. This landing strip is north of the Lucky G airstrip.

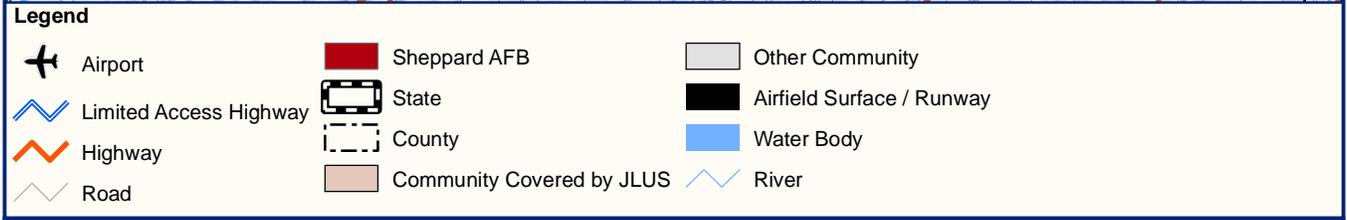
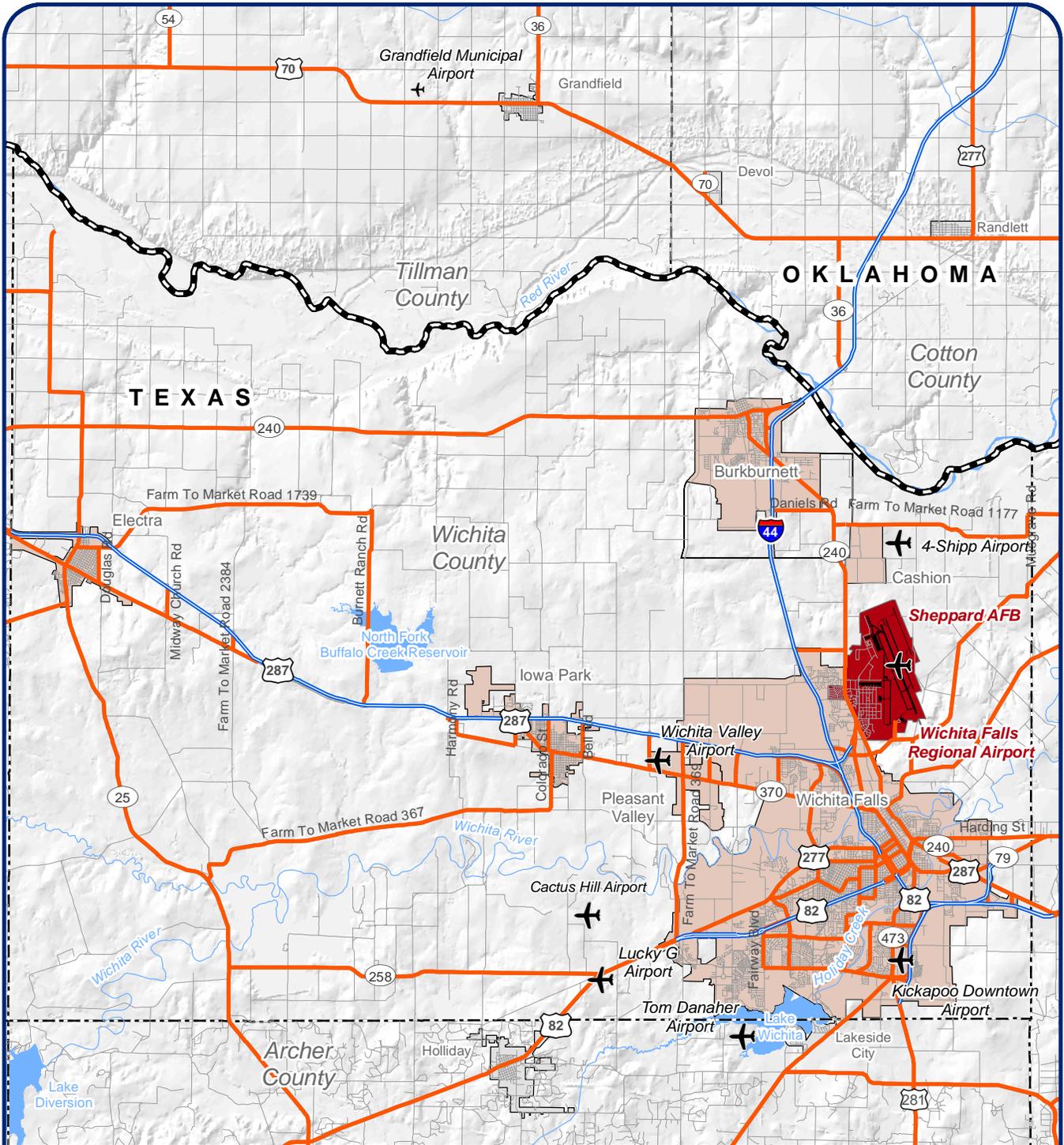


Figure 2-5
Sheppard AFB Study Area Transportation

- 4-Shipp Airport is a turf landing strip located within Sheppard AFB's Class D Surface Area, five miles southeast of Burkburnett. It is privately owned. There are restrictions on this airport at certain times due to training flights from Sheppard AFB.
- Tom Danaher Airport is a privately owned asphalt landing strip approximately five miles southwest of downtown Wichita Falls. It is located in northern Archer County, on the southwest edge of Lake Wichita.
- Grandfield Municipal Airport sits approximately 22 miles northwest of Sheppard AFB and three miles west of the City of Grandfield in Tillman County, Oklahoma. It is publicly owned by the City of Grandfield and has two asphalt runways.

2.2 Frederick Regional Airport Study Area

History and Profile



Great Plains Technology Center in Frederick

Tillman County occupies about 880 square miles of land located in the southwest corner of the state of Oklahoma along the banks of the Red River, which separates Oklahoma from Texas to the south. The area has a long history of agriculture and ranching, which continues to this day.

The area was first inhabited by members of the Plains Indians tribes, including the Kiowa and Comanche. As westward expansion progressed, the area was eventually resettled for farming and ownership was shaped by treaties, land lotteries, and trades which

took place from the mid-1800s through the turn of the century. The Katy Railroad supported a crop of new cities in the area, including Loveland, Hollister, and Tipton.

In 1902, the town sites of Hazel and Gosnell merged to form the City of Frederick. With the coming of the Blackwell, Enid, and Southern Railroad, the two towns joined and adopted the name Frederick (named after the son of a conductor on the first passenger train into town). In 1906, several remaining large tracts of land were opened to settlement, which effectively doubled what would become Tillman County.

The most significant political change came when Oklahoma entered statehood in 1907. This led to the creation of Tillman County the same year, with Frederick incorporated as the county seat. The area also experienced the boom and bust periods that followed the discovery in oil in northern Texas.

The establishment of Frederick Army Air Field in 1942 for the training of pilots boosted the local economy through World War II, and in 1946 the field was declared surplus property and converted into a civilian airport.

Nearly 4,000 people who live in the county reside in the City of Frederick. The area continues to experience a steady decrease in population. Tillman County and Frederick each experienced a decline in population of approximately 14 percent and 15 percent respectively between 2000 and 2010.

Study Area Growth Trends

The following section provides a profile of the Oklahoma component of the study area's population growth, housing growth, and median home values. This information assists in setting the regional context and growth potential for the JLUS.

Population

Since Frederick Regional Airport is part of the Sheppard AFB facilities, it is important to understand the demographic changes that could be associated with operations at the installation. While the state of Oklahoma has experienced an overall population growth, the region around Tillman County throughout southern Oklahoma has experienced continued population decrease in recent years. This is evident by the population decreases seen in Tillman County and the City of Frederick, given in Table 2-8. Figures

2-6 and 2-7 show the population densities within Tillman County in 2000 and 2010, respectively.

Table 2-8. Tillman County Population, 2000-2010

Jurisdiction	2000	2010	Number Change	Percent Change
Oklahoma	3,450,654	3,751,351	300,697	8.71
Tillman County	9,287	7,992	-1,295	-13.94
City of Frederick	4,637	3,940	-697	-15.03

Source: US Census 2000 and 2010

These steady population decreases represent substantial changes in the local population; however the Oklahoma State Data Center projects population growth for both the City of Frederick and Tillman County, as demonstrated in Table 2-9.

Table 2-9. Forecasted Population in Tillman County and City of Frederick, 2010-2030

Year	City of Frederick	Tillman County
2010	4,590	9,200
2015	4,640	9,300
2020	4,690	9,400
2025	4,740	9,500
2030	4,790	9,600

Source: Oklahoma State Data Center, Department of Commerce

Housing Trends

Housing trends are an important indicator of economic activity and vitality, demonstrating the population growth or decline relative to new residential construction within an area. Housing trends also represent market decisions relative to home ownership versus rental properties. Ultimately, housing trends potentially indicate future development and types of residential development to come. The following information portrays the housing market trends including building permit data (where available), the number of existing housing units, monthly gross rents, percentage of base allowance for housing and median home values within the JLUS area. Table 2-10 provides a comparison of the City of Frederick and Tillman County as a whole for the number of housing units within each community,

according to the 2010 Census. Between the years of 2000 to 2012, only five building permits were issued Tillman County.

Table 2-10. Existing Housing Stock in 2010

Jurisdiction	Housing Units
Tillman County	1,568
City of Frederick	4,040

Source: US Census 2010

Building Permits

According to the US Census, only 5 residential (all of which were single family) building permits were issues in all of Tillman County between the years 2000 and 2012. Three were issues in 2006 (one of which was issues in the City of Frederick), one was issues in 2007, and one was issued in 2011. This indicates a lack of new development in Tillman County and there is no anticipated major growth in the future.

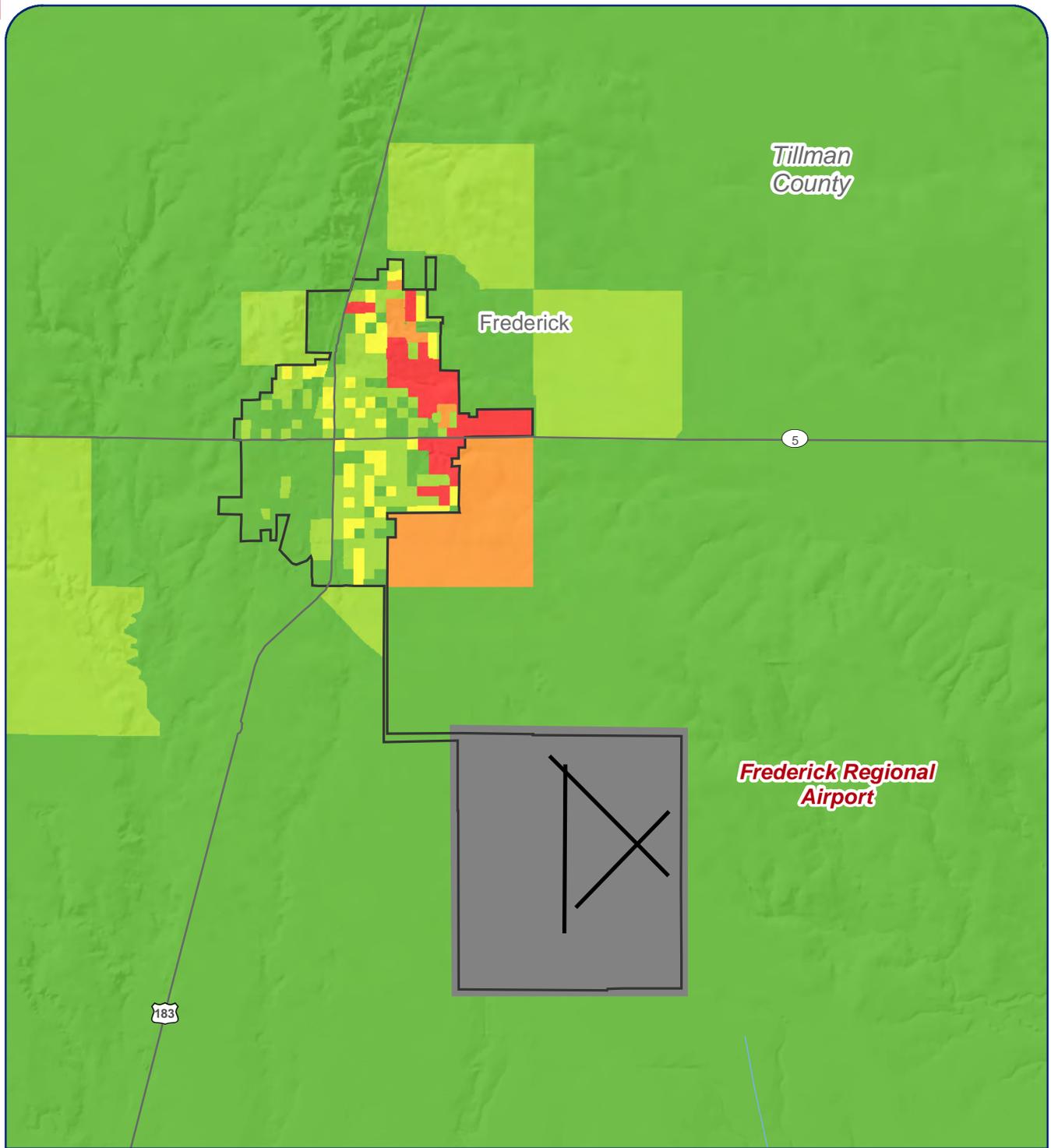
Housing Value Trends

Housing value trends can potentially indicate the change in land and home values relative to market fluctuations. These fluctuations can be indicative of development activity or inactivity and location or migration of people and where they will locate. Table 2-11 reports the median housing value trends for owner-occupied housing units in the JLUS area for the year 2000 and the estimated annual median values between the years 2008 and 2012.

Table 2-11. Median Housing Values, 2000-2012

Jurisdiction	2000	2008-2012 Estimate
Oklahoma	\$32,445	\$110,800
Tillman County	\$29,100	\$53,700
City of Frederick	\$27,300	\$42,600

Source: US Census 2000, American Community Survey 2008-2012, www.city-data.com



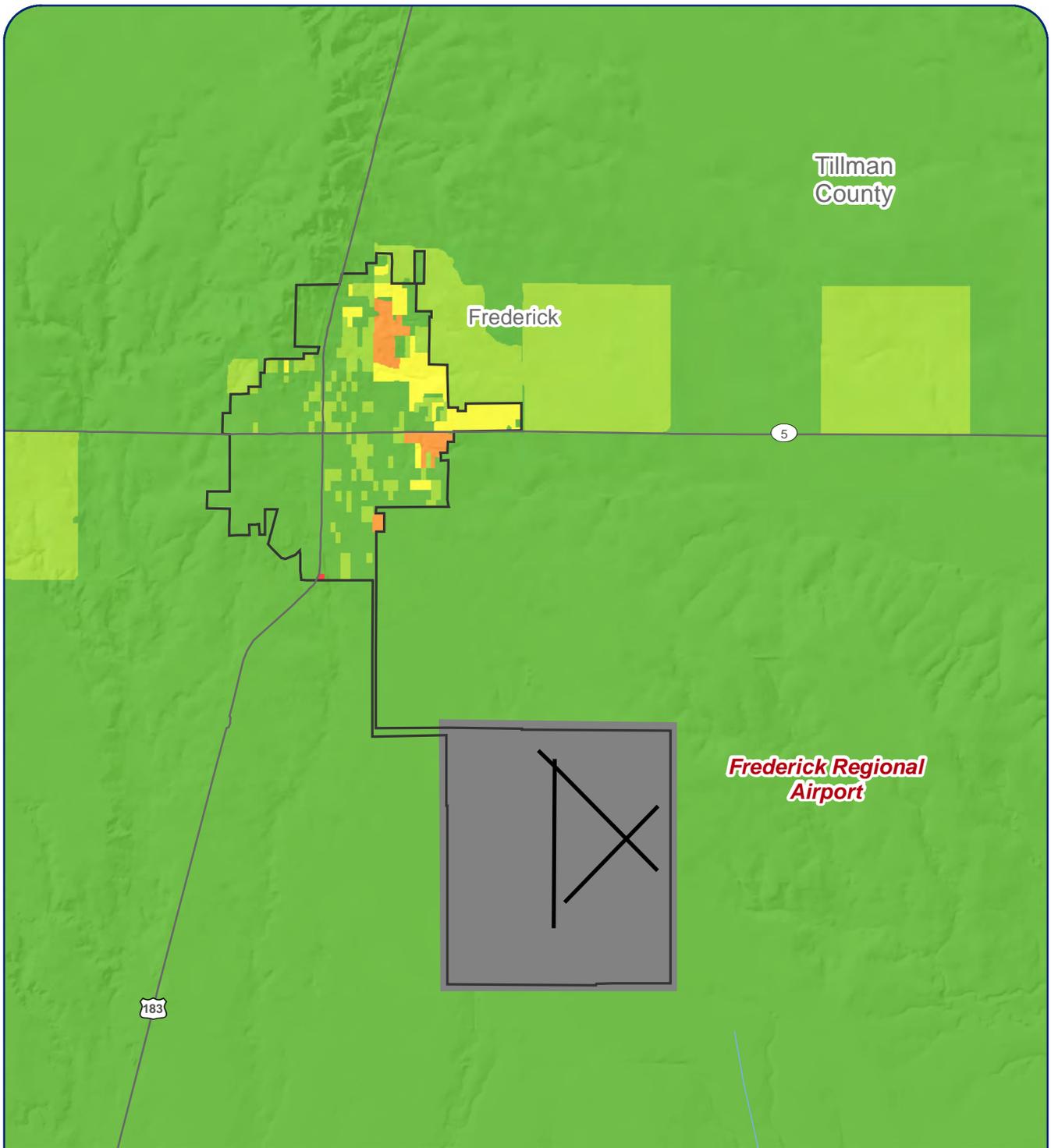
Legend

- | | | | |
|-----------------------------------|---------|----------------------------|----------------|
| Population Per Square Mile | 26 - 50 | Frederick Regional Airport | Airport Runway |
| 0 - 10 | 51 - 75 | Community | |
| 11 - 25 | > 75 | Highway | |



Sources: City of Wichita Falls, 2012; OCGI, 2012.

Figure 2-6
Tillman County Population Density, 2000



Legend

- | | | | |
|-----------------------------------|---------|----------------------------|----------------|
| Population Per Square Mile | 26 - 50 | Frederick Regional Airport | Airport Runway |
| 0 - 10 | 51 - 75 | Community | |
| 11 - 25 | > 75 | Highway | |



Sources: City of Wichita Falls, 2012; OCGI, 2012.

Figure 2-7
Tillman County Population Density, 2010

Economic Development

Generally, in the last fifty years the economy of Tillman County has traditionally relied on government, mineral extraction (oil), and agriculture. The estimated annual median income in Tillman County between 2008 and 2012 was \$34,550 and \$32,438 in the city of Frederick as shown in Table 2-12. This is significantly lower than the estimated annual median income for the State of Oklahoma; however, it is a drastic increase in income from the year 2000. This similar trend is seen in other Red River area counties which are heavily rural and do not have very diversified economies.

Table 2-12. Median Household Income Change, 2000-2012

Jurisdiction	2000	2008-2012 Estimate	Percent Change
Oklahoma	\$32,445	\$44,891	38.4%
Tillman County	\$24,828	\$34,550	37.2%
City of Frederick	\$22,190	\$32,438	46.2%

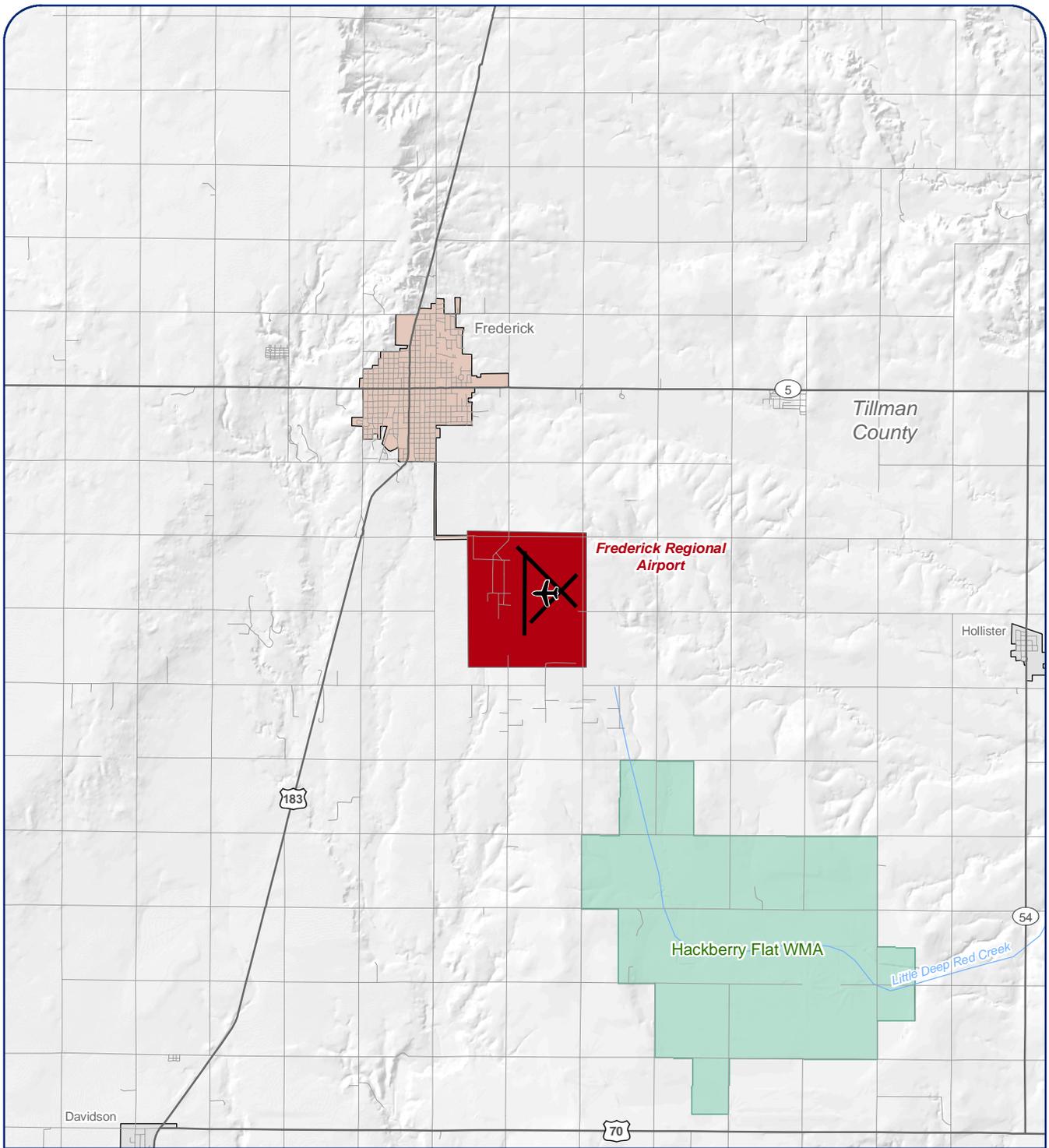
Source: US Census 2000, American Community Survey 2008-2012

The three largest industries in the county are manufacturing, retail, and healthcare services. While these industries provide the greatest employment in the region, the area has experienced a total decrease in population over the last ten years.

Transportation

The major federal highway in Tillman County is US Highway 183 connecting to US Highway 62 and points north and US Highways 70 and 287 to the south. US Highway 183 does not connect directly to a major metropolitan area for some distance. The primary State Highway is Route 5 (Figure 2-8).

Within the Tillman / Frederick portion of the study area, there is one general aviation airport, the Frederick Regional Airport located approximately three miles southeast from the intersection of US Highway 183 and State Road 5. The airport is used as an auxiliary landing field for Sheppard AFB pilot trainees. It consists of one primary north-south landing strip and three other lesser used landing strips.



Legend

- Airport
- Frederick Regional Airport
- River
- Highway
- Community Covered by JLUS
- Road
- Other Community
- Airport Runway
- Hackberry Flat WMA



0 1 2 Miles

Sources: City of Wichita Falls, 2012; OCGI, 2012; Esri, 2012.

**Figure 2-8
Frederick Regional Airport Study Area Transportation**

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CHAPTER 3: MILITARY PROFILE

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Sheppard AFB is located in north-central Texas, five miles north of the City of Wichita Falls' Downtown Business District. The installation encompasses approximately 4,633 acres of land and has four runways, three of which are used by the City of Wichita Falls Regional Airport to support commercial and general aviation activities. It operates the second busiest joint-use airfield in the Air Force and the fourth busiest airfield, not in a combat zone, in the Air Force (as of 2013).

The 82nd Training Wing is the largest technical training unit in the Air Force and is the host wing at Sheppard AFB, providing training to over 60,000 Airmen, Soldiers, Sailors, Marines and international students each year. The wing manages around 1,000 classes taught at Sheppard and 61 locations across the globe. The 80th Flying Training Wing conducts the Euro-NATO Joint Jet Pilot Training (ENJJPT) Program sponsored by the North Atlantic Treaty Organization (NATO). Each year over 200 pilots receive their wings through the ENJJPT program. Over 150 pilots selected for fighter aircraft learn critical combat skills through the Introduction to Fighter Fundamentals program.

The United States Air Force (USAF) also has an agreement with an auxiliary airfield in Frederick, Oklahoma, located approximately 57 miles northwest of Sheppard AFB. Frederick Regional Airport is used by Sheppard AFB T-6 trainers for high density student pilot training.

3.1 Sheppard Air Force Base, Texas.....	3-2
Base History	3-2
Base Establishment and World War II.....	3-2
Cold War Missions.....	3-2
Current Sheppard AFB Operations	3-3
Economic Benefit.....	3-3
Installation Setting	3-4
Military Operations.....	3-4
82nd Training Wing.....	3-7
80th Flying Training Wing.....	3-8
Noncommissioned Officer (NCO) Academy	3-9
Air Operations.....	3-9
Runways and Flight Patterns.....	3-11
Projected New Missions	3-11
Military Mission Footprints	3-11
Flight Patterns.....	3-12
Low-Level Military Training Routes (MTRs) ..	3-12
Imaginary Surfaces.....	3-12
Safety Zones.....	3-14
Aircraft Noise	3-18
3.2 Frederick Regional Airport, Oklahoma....	3-20
Base History	3-20
Economic Impact	3-20
Installation Setting	3-20
Military Operations.....	3-22
Projected New Missions	3-22
Military Mission Footprints	3-22
Flight Patterns.....	3-22
Safety Zones.....	3-24
Aircraft Noise	3-24
Imaginary Surfaces.....	3-24

3.1 Sheppard Air Force Base, Texas

Base History

Base Establishment and World War II

Sheppard AFB was developed in response to growing pressure for additional technical training schools for the US Army Air Corps during the late 1930s and early 1940s. Areas in Wichita Falls near Call and Kell Fields were surveyed in 1940 by General Lincoln, the Commander of Air Corps Technical Training Command because of the areas flat topography and proximity to the established 3,000 foot runway at Kell Field. On December 6, 1940, Sidney Kring, representing the Wichita Falls Chamber of Commerce successfully presented the city's case to establish the technical school to the War Department. The first airmen arrived in May 1941 to Sheppard Field to begin construction of the installation's housing, administration, training, and medical facilities.

As the threat of war increased, the original mission to train aviation mechanics was quickly expanded to include a basic training center. The first aircraft maintenance training began in October 1941. By the US entrance into World War II in December 1941, the fifth class of aviation mechanics included 800 students, with a planned graduation rate of nearly 40,000 per year in addition to the 19,000 recruits completing basic training on the base. This rapid expansion was augmented by \$1.6 million for the construction of an additional 30 buildings at Sheppard Field.

The Army expanded Sheppard Field operations again in September 1942 to include glider training in preparation for the invasion of Europe; a Liaison Pilot School to train artillery spotters; helicopter training for pilots and mechanics; and bomber flight engineer courses. By the end of the war in August 1945, almost 500,000 mechanics and basic trainees completed training at Sheppard Field.

Cold War Missions

Even as war operations came to a close, activity at Sheppard Field remained high as the base served as a separation center for deactivating troops. The installation was inactivated in August 1946 with only a minor maintenance contingency. During its active war status, the base contributed nearly \$100 million to the local economy. While most structures were closed

during deactivation, some facilities were turned over to nonprofit groups such as Hardin College (now Midwestern State University) for use as dormitories.

In August 1948 the base was reactivated by the US Air Force to support Cold War training and other military operations. The base initially served as a basic training center to support Lackland AFB but quickly resumed aviation maintenance training duties. This mission has continued to this day as aircraft types and training have been updated to reflect the Air Force's current demands.

In light of the substantial mission capacity of Sheppard AFB, the installation was given a permanent Air Force base designation in January 1950. This designation came as base operations again escalated to meet the demand of the Korean War, and soon over 15,000 troops were being trained during a three shift training schedule. This increased level of activity continued until mid-1954 with the end of US involvement in the conflict.

The maintenance of a large US peacetime military force necessitated adaptation to Sheppard AFB facilities, which including increased family housing, new training facilities, and runway repairs. The base adapted to meet the changing needs of the US military, including training in ballistic missile maintenance, communications training, and civil engineering training. Over 47,000 specialists from the inter-continental ballistic missile courses were trained over the next eight years. Furthermore, Sheppard received an active operational mission when a bomb wing was stationed at Sheppard AFB by the Strategic Air Command. This unit included crews which maintained constant alert status until the early 1970s. This time also saw the consolidation of operations from Amarillo AFB and Gunter AFB to Sheppard AFB, which increased training demands and flight operations at Sheppard AFB during the Vietnam War. This was evident as nearly 80 percent of all helicopter training graduates from Sheppard AFB received assignments to Southeast Asia during this time.

The 1970s brought realignment in Sheppard's mission. Helicopter pilot training was reassigned to Fort Rucker, AL and the 80th Flying Training Wing was activated in 1972 to train allied pilots under the security assistance program. This was updated in 1978 when NATO selected Sheppard as the site for the Euro-NATO Joint Jet Pilot Training (ENJJPT) program.

Furthermore, the transfer of Inter-Continental Ballistic Missile operations to Vandenberg AFB in California discontinued inter-continental ballistic missile training at Sheppard. Base closures at Lowry, CO and Chanute, IL consolidated all aircraft maintenance training to Sheppard AFB.

Current Sheppard AFB Operations

Sheppard's mission was again changed in July 1993 when the Air Training Command was re-designated as the Air Education and Training Command (AETC). This activated the Second Air Force to manage technical training and the Nineteenth Air Force to oversee flight training at Sheppard AFB. This also led to the reassignment of the Sheppard Training Center as the 82nd Training Wing. These training exercises composed the bulk of Sheppard's operations over the next decade until the 2005 Base Realignment and Closure (BRAC) actions transferred enlisted medical training activities and the 882d Training Group to Fort Sam Houston, Texas. This transfer was completed in September 2011. Prior to the 2005 BRAC decisions, Sheppard AFB was proposed to receive a new mission of the Air Force's portion of the F-35 Lightning II, also known as the Joint Strike Fighter (JSF), Initial Joint Training Site. As a result of BRAC, this mission was instead relocated to Eglin AFB in the Florida Panhandle.

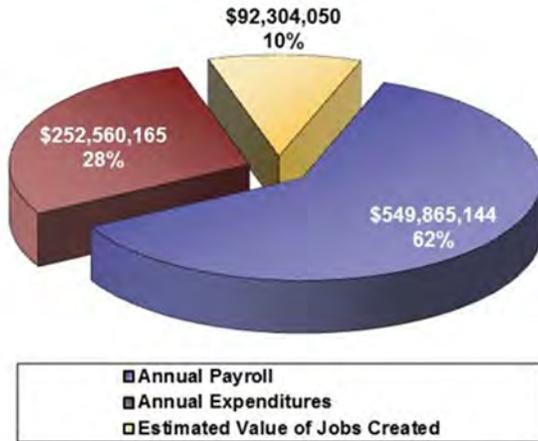
For eight decades, Sheppard Air Force Base has been one of the Air Force's premier training bases, one of the few to host both technical and flying training missions. Over one million Airmen and technicians have been trained in Sheppard's facilities and schools. Today Sheppard produces more technical training graduates than any other Air Force tech training base. The installation continues a critical international role in developing U.S. and allied airpower, producing highly trained combat pilots for the NATO Alliance, as well as foreign enlisted and officer personnel in a variety of disciplines.

Economic Benefit

The Economic Impact Region for Sheppard AFB is the geographic area subject to significant base-generated economic impacts, and is generally defined as the area within a 50-mile radius of the base. This area totally encompasses three counties (Wichita, Archer, and Clay) and parts of six counties (Willbarger, Baylor, Throckmorton, Young, Jack, and Montague.) All impacted counties are in Texas, as the area north of the Red River (Oklahoma) is included in Fort Sill's Economic Impact Region. Wichita County and nearby

cities and towns (Wichita Falls, Burkburnett, etc.) experience the majority of the economic benefits from Sheppard AFB in respect to employment and income.

In FY12, Sheppard AFB had an economic impact of nearly \$895 million on the 50-mile commuting radius. Figure 3-1 shows the breakdown of the total economic impact of Sheppard AFB in the region. Sheppard AFB directly employs approximately 6,469 military personnel (includes active duty, guard, reserve, trainees/cadets) and 3,430 civilian personnel (includes appropriated and non-appropriated funded positions, contractors, Base Exchange, and private business.) The total payroll associated with these jobs is nearly \$550 million. In addition, there are 4,620 dependent personnel associated with Sheppard AFB, bringing the total number of base personnel to 14,519.



Source: Sheppard AFB FY12 Economic Impact Statement

Figure 3-1. Sheppard AFB Economic Impact FY12

It is estimated that 2,635 jobs are created indirectly in surrounding communities in support of Sheppard AFB with an estimated annual value of \$92 million. There are 3,774 military retirees associated with the base that draw annual retiree disbursements in excess of \$87 million.

In addition to the nearly \$550 million in payroll created by Sheppard AFB, the installation has over \$250 million in direct annual expenditures. These expenditures cover many broad categories, to include facility operations, maintenance, and construction; service and maintenance contracts; commissary and Base Exchange; and, health care.

Installation Setting

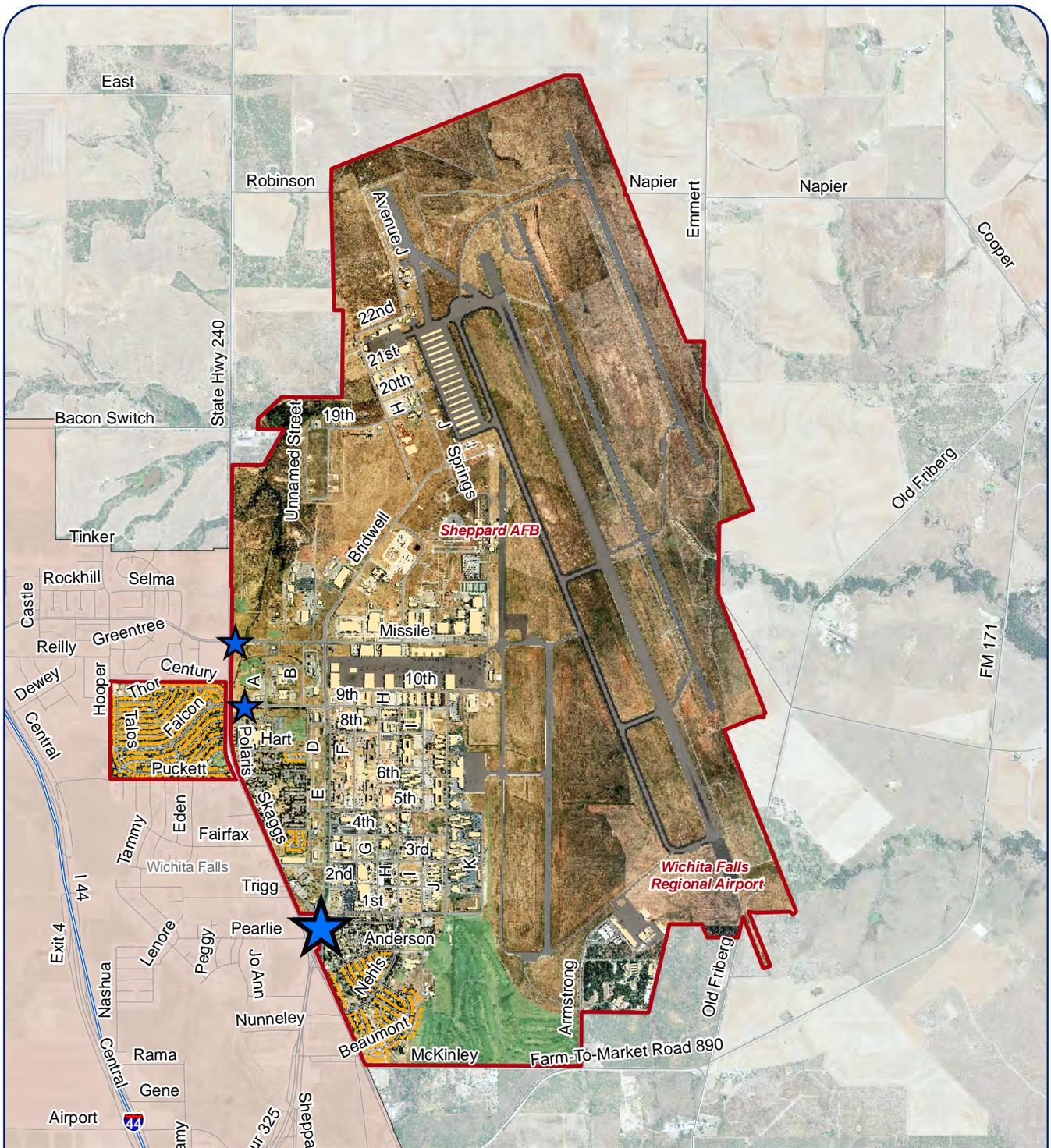


Sheppard AFB is located in north-central Texas, approximately five miles north of Wichita Falls' Downtown Business District, 146 miles northwest of Dallas, and 135 miles southwest of Oklahoma City. It is approximately 15 miles south of the Oklahoma state line on Interstate 44 / US Highway 281 / US Highway 277. Sheppard AFB is bordered by the City of Wichita Falls to the west and south, the City of Cashion Community to the north, and unincorporated lands within Wichita County on the remaining sides. The area is accessible by a state highway and road system, the Wichita Falls Regional Airport (joint use airfield), and interstate bus service.

The base is located on 4,633 acres including easements and right-of-way for runway approach and the drainage ways off base. There are 418 buildings (7,498,177 square feet) and 714 family housing units (operated by a private contractor). Figure 3-2 illustrates an overview of Sheppard AFB and where the development is located on the base and Figure 3-3 illustrates how the base is broken down by land use categories as described in the base's general plan.

Military Operations

Sheppard AFB operates the second busiest joint-use airfield in the Air Force and the fourth busiest airfield, not in a combat zone, in the Air Force (as of 2013). It also has the distinction of being the only base in the Air Force to have both a technical training wing and a flying training wing mission. Before outlining military operations, it's important to understand the scope of activities and units operating on Sheppard AFB, which is home to two large wings and nearly 20 partner organizations.



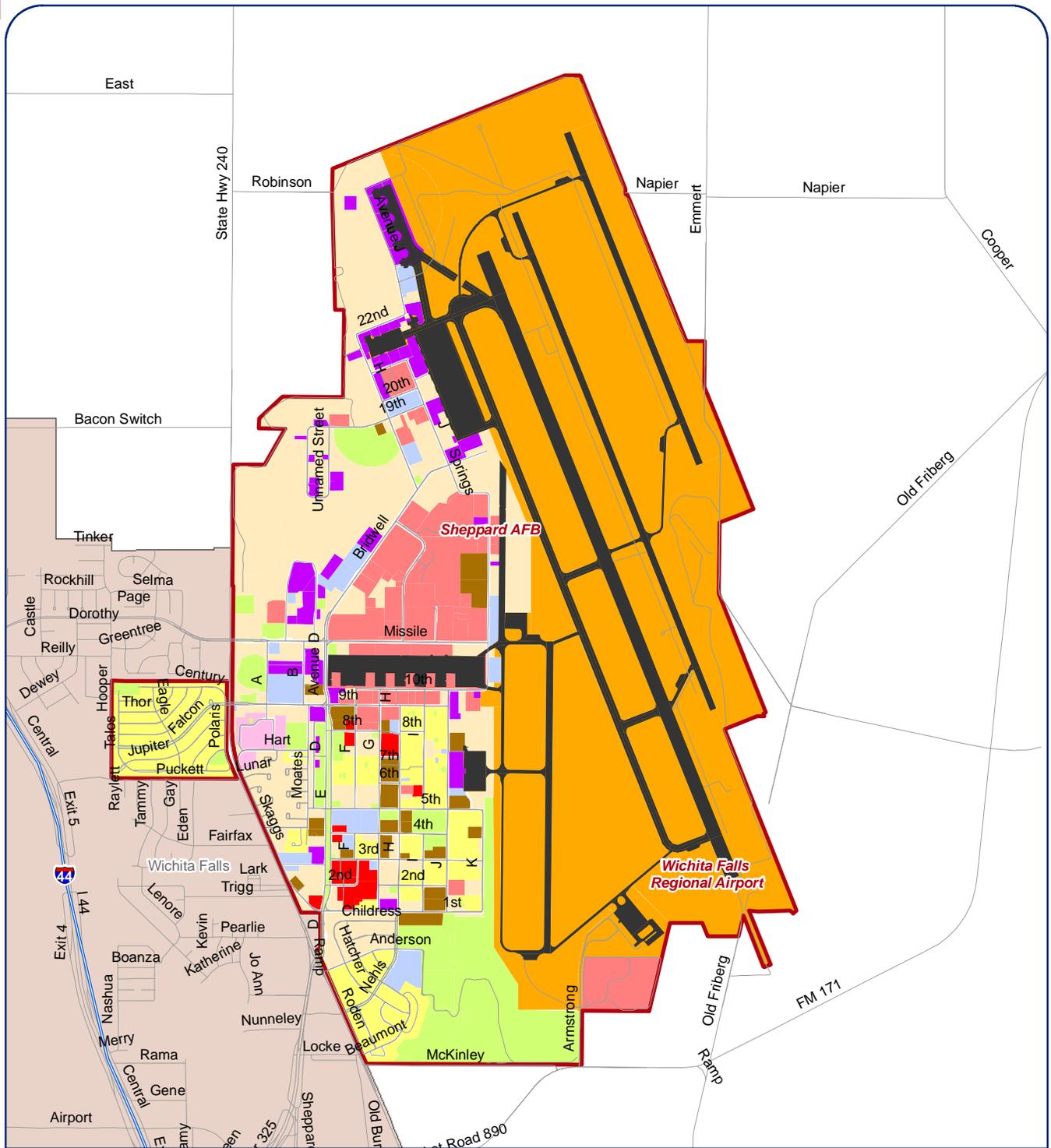
Legend

- Sheppard AFB
- Airfield Surface Area
- Housing
- Other
- Recreation Area
- Highway
- Road
- ★ Gate
- Wichita Falls



Sources: City of Wichita Falls, 2012; TNRS, 2012; Sheppard AFB, 2012.

Figure 3-2
Sheppard AFB Installation Setting



Legend

Land Use	Housing	Service	Airfield Surface Area
Administrative	Industrial	Training	Sheppard AFB
Airfield Other	Medical	Vacant / Available	Wichita Falls
Commercial	Open Space / Recreation		



Sources: City of Wichita Falls, 2012; TNRIS, 2012; Sheppard AFB, 2012.

Figure 3-3
Sheppard AFB Land Use

82nd Training Wing



The 82nd Training Wing (82 TRW) is the host unit at Sheppard AFB and its AETC mission is among the most diverse in the Air Force. The unit managed nearly 1,000 courses in 2012, which trained more than 60,000 Airmen. A diverse selection of courses is offered in civil engineering, nuclear and conventional munitions, aircraft maintenance, aerospace ground equipment, avionics, and telecommunications. The wing consists of a mission support group, a medical group, and three training groups.

- **82nd Mission Support Group:** The 82nd Mission Support Group provides the logistical support for training and operations at Sheppard AFB. The two wings and 17 tenants at Sheppard AFB include more than 5,900 military, contractor, and civilian personnel, 9,200 dependents, and nearly 82,000 trainees which cycle through the installation every year. The 82nd Mission Support Group is responsible for security, personnel support, food services, communications, contracting services, logistics, supplies, vehicle maintenance, housing, lodging, facility maintenance, and emergency services for the installation
- **82nd Medical Group:** The 82nd Medical Group provides both the comprehensive health services for the 20,000 military personnel and other beneficiaries at Sheppard AFB, as well as aerospace and physiology services for the NATO and DOD instructors who are a part of the ENJJPT program at Sheppard AFB. The group includes 549 permanent personnel stationed at Sheppard AFB to support this mission
- **82nd Training Group:** The mission of the 82nd Training Group is to “provide effective and efficient aircraft maintenance, munitions and military training to build, strengthen, and sustain global combat capability.” This mission includes conducting aircraft armament and maintenance training at Sheppard AFB. These skills courses extend over 17 different Air Force Specialty Codes offered to both enlisted Airmen and officers.
- **782nd Training Group:** The training conducted by the 782nd Training Group offers the most diverse training throughout the Air Education and Training Command, including courses ranging from avionics test equipment, aircraft systems maintenance, combat avionics, telecommunications, flight line training, fuels, civil, electrical, and mechanical engineering, and explosive ordnance disposal (EOD). It provides technical and military training to US and international military personnel and DOD civilian personnel annually in more than 153 initial and advanced resident and mobile training team active courses.
 - **364th Training Squadron:** The 364th Training Squadron develops, conducts and evaluates technical training in fuel systems, aircraft electrical and environmental, hydraulic systems maintenance, communications cable and antenna systems, and cyber transport systems. It has detachments located at Fort Leonard Wood, Missouri (which provides training for vehicles operations, emergency management, engineering assistant, pavements and equipment, and security forces), in Bluemont, Virginia (which provides advanced emergency management training), and in Fort Lee, Virginia (which provides training in fuels laboratory skills).
 - **365th Training Squadron:** The 365th Training Squadron provides career development, supplemental and craftsmen courses for all avionics specialties in heavy aircraft, fighter aircraft and avionics test equipment.
 - **366th Training Squadron:** The 366th Training Squadron provides technical and military training for international military and civilian DOD students in vehicle operations, and eight of the Air Force's 13 civil engineer career fields. The 366th Training Squadron is responsible for resident, exportable, mobile training team, and career development courses executed at Sheppard AFB, geographically separated detachments, and United States Air Force installations worldwide.

- **367th Training Squadron:** The 367th Training Squadron is located at Hill AFB in Utah. It produces world-class interactive multimedia instruction for aircraft and munitions maintenance training for the Headquarters of Air Combat Command and Air Mobility Command.
- **982nd Training Group:** Sheppard AFB hosts the headquarters of the 982nd Training Group. While the Group does not conduct any training at Sheppard AFB, the headquarters supports 44 operating locations worldwide where the 982nd conducts weapons systems training. The Group is responsible for developing comprehensive training programs and technical support for equipment during the acquisition and modification of aircraft phases of development. Furthermore, the 982nd Training Group provides hands-on aircraft, munitions, and communications-electronics maintenance training.
 - **372nd Training Squadron:** The 372nd Training Squadron offers advanced skills aerospace maintenance training for the DOD and its allies. They enhance the combat capability of the USAF by meeting the evolving needs of aircraft maintenance training, support training and technical support.
 - **373rd Training Squadron:** The 373rd Training Squadron provides premier maintenance training for all major commands, sister services and allied nations in airlift, special operations, tanker support and aerospace ground equipment.
 - **982nd Maintenance Squadron:** The 982nd Maintenance Squadron creates, acquires, maintains and sustains state-of-the-art aerospace maintenance, telecommunications and civil engineering trainers and training aids to sustain warfighter capabilities. The squadron provides first class, behind the scenes technical training support and assists in the successful instruction of over 70,000 Airmen and sister service members every year.

80th Flying Training Wing



The 80th Flying Training Wing (80 FTW) is the flight training tenant on Sheppard AFB. Its role is to support the training mission and capabilities of the world's only internationally managed pilot training program. The ENJJPT program has been in operation for over 30 years at Sheppard AFB and has trained over 6,400 pilots for the 13 NATO-allied countries which participate in the program.

The heavy training schedule maintained by the 80FTW makes Sheppard AFB the Air Force's fourth busiest airfield not in a combat zone (as of 2013). Over 55,000 sorties were flown from Sheppard AFB in 2011.

The mission of the 80 FTW is "To produce the world's finest NATO pilots with the skills and attitude to succeed in fighter aviation" and their vision is "To be the world's premier Combat Pilot Training Program." The wing also has an operations group and a contractor-operated aircraft maintenance unit.

- **80th Operations Group:** The 80th Operations Group provides operational support for missions conducted at Sheppard AFB. These support functions include flight training, air traffic control operations, and pilot evaluation. The group maintains six squadrons at the installation, including the 80th Operations Support Squadron, the 88th Fighter Training Squadron, the 89th Flying Training Squadron, the 90th Flying Training Squadron, the 459th Flying Training Squadron and the 469th Flying Training Squadron. These squadrons, with support from the USAF Reserve 97th Flying Training Squadron, train undergraduate pilots from NATO countries. The specific functions of each squadron are listed below:

- **80th Operations Support Squadron:** The 80th Operations Support Squadron is a multinational squadron made up of pilots from 13 NATO countries. This squadron provides direct mission support to the 82nd Training Wing, 80th Flying Training Wing and the ENJJPT. The squadron's responsibilities include joint-use airfield management, air traffic control, flying scheduling, aircrew flight

equipment, aviation and airspace management, weather, student training, computer and administrative support to six flying squadrons.

- **88th Fighter Training Squadron:** The 88th Fighter Training Squadron composed of personnel from five different nations. The squadron operates the Introduction to Fighter Fundamentals (IFF) course and Upgrade Instructor Pilot missions for the ENJJPT. The IFF course is a 10-week program that is the final phase of training for fighter pilots. The squadron trains approximately 150 pilots annually utilizing 32 T-38C Talon aircraft.
- **89th Flying Training Squadron:** The 89th Flying Training Squadron is another multinational NATO-supported unit responsible for pilot training operations at Sheppard AFB. Nearly 200 student pilots and instructor trainees are trained each year.
- **90th Flying Training Squadron:** The 90th Flying Training Squadron is a multinational force composed of 60 multinational personnel representing 13 signatory NATO nations. The squadron provides advanced jet flying training and Pilot Instructor Training as part of the ENJJPT mission. The squadron flies 46 T-38s, with over 11,500 training sorties and 13,000 flying hours conducted annually.
- **97th Flying Training Squadron:** The 97th Flying Training Squadron directs the AETC and Air Force Reserve Command Associate Instructor Pilot Program and provides Active Guard Reserve and Traditional Reserve instructor pilots to augment the cadre of active duty pilots conducting pilot training. This unit can be mobilized during wartime to offset anticipated losses of experienced active duty pilot contributions to the instructor pilot training programs.

- **459th Flying Training Squadron:** The 459th Flying Training Squadron is an AETC multinational training squadron, comprised of 60 personnel representing 13 signatory NATO nations training over 100 student pilots for NATO annually. The squadron provides Pilot Instructor Training for 24 instructor pilot candidates annually.
- **469th Flying Training Squadron:** This multinational, NATO-based squadron trains over 200 students annually in undergraduate, pilot instructor, and continuation courses annually.

Noncommissioned Officer (NCO) Academy



Sheppard AFB houses one of the Air Force's eleven NCO Academies. The NCO Academy at Sheppard AFB was established in 2010 with the intent to help fill the growing need for Air Force tech sergeants. The program allows

mid-career Air Force personnel to enhance technical skills and support the Air Force's diverse mission capabilities.

Air Operations



Sheppard AFB Air Control Tower

Air operations are conducted with the aircraft described below:

T-6A Texan II



This single-engine, two-seat aircraft was designed to train Joint Primary Pilot Training (JPPT) students in basic flying skills to become Air Force and Navy pilots. The T-6A was first used for training operations in 2000 at Randolph AFB in Texas and is currently used at five other Air Force bases, including Sheppard AFB. This versatile aircraft prepares pilots in basic skills necessary to move onto one of the four training tracks, including bomber, fighter, airlift, tanker, turboprop, or helicopter operations throughout the Air Force and Navy.

Length: 33.4 feet
 Height: 10.7 feet
 Wingspan: 33.5 feet
 Speed: 320 miles per hour
 Ceiling: 31,000 feet
 Range: 900 nautical miles

Crew: 2, student pilot and instructor

Armament: None

T-38C Talon



The T-38C is a twin-engine supersonic jet capable of high altitude training operations. This aircraft is used in numerous roles as part of the Air Force's AETC for pilot training operations at Sheppard AFB. This is one of the primary aircraft used in the ENJJPT program to train NATO pilots.

Length: 46.3 feet
 Height: 12.8 feet
 Wingspan: 25.3 feet
 Speed: 812 miles per hour
 Ceiling: Above 55,000 feet
 Range: 1,093 miles

Crew: 2, student pilot and instructor

Armament: None

Sources: US Air Force T-38 Talon Factsheet, 2013;
 US Air Force T-6A Texan II Factsheet, 2013

Table 3-1. Sorties and Hours Flown by Type of Aircraft, 2012

Aircraft Type	Number	Sorties	Hours
T-6	77	22,721	30,831
T-38C (includes IFF)	124	31,067	33,174
Total	201	53,788	64,005

Source: Sheppard Air Force Mission Brief, 2012.

Runways and Flight Patterns

Sheppard AFB has three parallel runways and one off-angle runway.

Runway 15R/33L, the inner and southwestern most of the parallel runways, is 13,101 feet long by 300 feet wide; Runway 15C/33C, the center runway, is 10,003 feet long by 150 feet wide; and Runway 15L/33R, the outer and northeastern most runway is 6,000 feet long by 150 feet wide. Runway 17/35 is 7,021 feet long by 150 feet wide.

Runways 15R/33L and 15C/33C are used primarily for T-38 operations, while Runway 15L/33R is used primarily for T-6 aircraft. Commercial aircraft land on both Runways 15L/33R and 15C/33C but primarily take off on Runway 17/35.

Aircraft operating at Sheppard use the following flight patterns:

- T-38 VFR traffic patterns (Runway 15R/33L): Straight-in (2,300' mean sea level [MSL]); Normal Overhead (2,800' MSL); Breakout (4,000' MSL); High Pattern (4,500' MSL); and, Falls Pattern (5,000' MSL)
- T-6 VFR traffic patterns (Runway 15L/33R): Straight-in (1,500' MSL); Normal Overhead (2,000' MSL); Breakout (3,000' MSL); Chase Pattern (3,500' MSL); and, Emergency Landing Pattern (4,000' MSL)

Projected New Missions

The Sheppard AFB General Plan (2008) identifies a long range facilities plan that builds flexibility into the base's overall capabilities; however, the capacity to support new missions is not specifically explored. The plan identifies and reserves land areas that can support new flying and nonflying mission activities for potential mission expansion in the future. Though no new missions are currently programmed for Sheppard

AFB, the capacity to support new activity is worth noting.

Military Mission Footprints



T-38 and T-6 Taxiing

As evidenced by the variety of units operating within the 82 TRW and the 80 FTW, there are a multitude of operations occurring on and around Sheppard AFB. The military is sensitive to the footprint it casts on communities surrounding installations, just as the community must be mindful of how development and land use outside an installation affects military operations.

The majority of ground operations, which primarily take place under the authority of the 82 TRW, occur on the installation and have little effect on the surrounding community. This includes the training of personnel specializing in aircraft maintenance; armament and munitions; aircraft systems and telecommunications; avionics test equipment; combat avionics; flight line training; electrical systems; and EOD. Despite the fact that the preponderance of 82 TRW day-to-day operations does not create significant impacts outside the fence-line, it is important to acknowledge that some factors need to be addressed. Some of these compatibility factors include occurrences of increased noise (i.e., explosive ordnance training, aircraft engine run-ups, etc.), competition for limited water resources, Anti-Terrorism / Force Protection concerns, and potential for frequency spectrum interference.

Conversely, the daily operations of the 80 FTW, a pilot training organization, can have significant mission footprint impacts on the areas surrounding Sheppard AFB. These areas of concern include approach and departure flight patterns, military training routes, safety zones, and aircraft noise.

Flight Patterns

Pilot training requires the designation and assignment of specific flight patterns; however, aircraft can deviate from these. Flight patterns are largely based on the proximity of populated areas, the amount of airspace required for the specified training, as well as the weather, pilot, and number of other aircraft in the flight pattern. An issue of concern is the ability of the student pilot to maintain their assigned pattern.

For the installation, there are specific flight patterns for approach, departure, and touch-and-go. As seen on Figure 3-4, there are a number of flight patterns that occur over the Wichita Falls, Cashion Community, and a good portion of Wichita County. These flight patterns are not a point of concern taken in isolation, but must be considered when examining safety zones, noise contours, and imaginary surfaces. If a deviation from the flight pattern is anticipated due to weather or any other externality, communication with Air Traffic Control (ATC) personnel precedes any departure.

The area surrounding Sheppard Air Force Base / Wichita Falls Regional Airport is host to a great variety of aviation activities. Numerous airline, other civil aviation, and military training flights take place at Sheppard Air Force Base / Wichita Falls Regional Airport and in the surrounding area.

Sheppard AFB / Wichita Falls Regional Airport is unique in that it is the only United States Air Force flight training base that hosts a civilian regional airport. During most times when the 80th Flying Training Wing is flying, Sheppard tower controls Runways 17/35 and 15C/33C. Runways 15R/33L and 15L/33R are controlled by separate runway supervisory units (RSUs). These RSUs control either T-38 or T-6 aircraft on separate UHF frequencies.

During normal operations, civilian aircraft primarily takeoff and land on Runway 17/35. T-38 aircraft utilize a west traffic pattern from 2,300 to 5,000 feet MSL on Runway 15R/33L. It is imperative that aircraft operating on Runway 17/35 comply with altitude restrictions (usually to remain at or below 1,800 feet MSL) given by Sheppard Air Traffic Control. This will

decrease the chance of a conflict with traffic operating from other runways.

Low-Level Military Training Routes (MTRs)

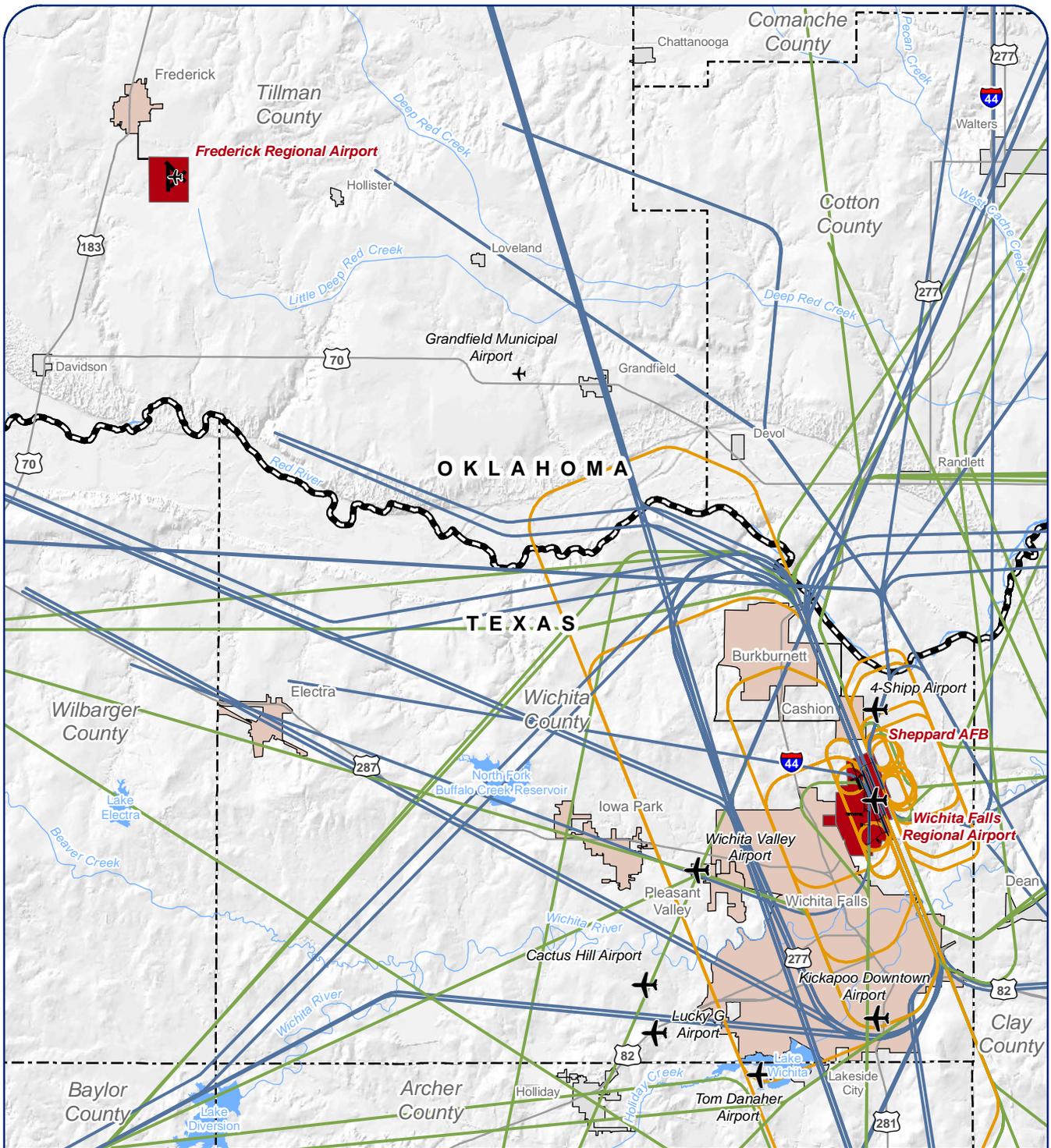
The 80th Flying Training Wing at Sheppard AFB conducts extensive low-level training within 100 miles of the base. Because these MTRs extend a great distance from Sheppard AFB, they are not depicted on Figure 3-4. Training is conducted from 1,500 to 500' AGL, at speeds up to 450 knots for T-38 aircraft and 250 knots for T-6 aircraft. Military pilots use the routes to maintain proficiency by simulating wartime missions. MTRs are not only used by Sheppard training aircraft, but also by various other fighter, bomber, and transport aircraft. Flight in or near MTRs requires constant vigilance since the hazard potential is great. Flight through MTRs is not prohibited; however, it is not recommended.

Sheppard recommends civilian traffic avoids flying below 2,000' AGL when in the vicinity of an MTR. This keeps them above high speed military jet traffic as well as provides a greater margin of safety in the event of engine failure.

Imaginary Surfaces

The Federal Aviation Administration (FAA) has identified certain imaginary surfaces around runways that are used to determine how structures and facilities are evaluated to identify if they pose a vertical obstruction in relation to the airspace around a runway. The levels of imaginary surfaces build upon one another and are designed to eliminate obstructions to air navigation and operations, either natural or man-made. The dimension or size of an imaginary surface depends on the type of runway around which it is based. A description of each of the imaginary surfaces for an Air Force Class B IFR runway (which is what runways 15L/33R, 15C/33C, and 15R/33L at Sheppard AFB are) is as follows:

- **Primary Surface:** 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.



Legend

- | | | | |
|-----------------------|----------------------------|---------------------------|------------|
| Flight Pattern | Airport | State | Highway |
| Arrival | Airfield Surface / Runway | County | River |
| Closed Pattern | Facilities Covered by JLUS | Community Covered by JLUS | Water Body |
| Departure | | Other Community | |



Figure 3-4
Sheppard AFB Mission Footprint: Flight Patterns

Sources: City of Wichita Falls, 2012; TNRS, 2012; OCGI, 2012; Sheppard AFB, 2012.

- **Approach-Departure Clearance Surface:** This 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.
- **Inner Horizontal Surface:** This imaginary surface is an oval plane at a height of 150 feet above the established airfield elevation. The inner boundary intersects with the approach-departure clearance surface and the transitional surface. The outer boundary is formed by scribing arcs with a radius 7,500 feet from the centerline of each runway end and interconnecting these arcs with tangents.
- **Conical Surface:** This is an inclined imaginary surface extending outward and upward from the outer periphery of the inner horizontal surface for a horizontal distance of 7,000 feet to a height of 500 feet above the established airfield elevation. The slope of the conical surface is 20:1. The conical surface connects the inner and outer horizontal surfaces.
- **Outer Horizontal Surface:** This imaginary surface is located 500 feet above the established airfield elevation and extends outward from the outer periphery of the conical surface for a horizontal distance of 30,000 feet.
- **Transitional Surface:** This imaginary surface extends outward and upward at right angles to the runway centerline and extended runway centerline at a slope of 7:1. The transitional surface connects the primary and the approach-departure clearance surfaces to the inner horizontal, the conical, and the outer horizontal surface.

Air Force Class A IFR runways have the same dimensions for the inner horizontal, conical surface, outer horizontal, and transitional surface as Class B IFR runways. However, the primary surface and approach-departure clearance surfaces are different. For an Air Force Class A IFR runway, the primary

surface and approach-departure clearance surface are as follows:

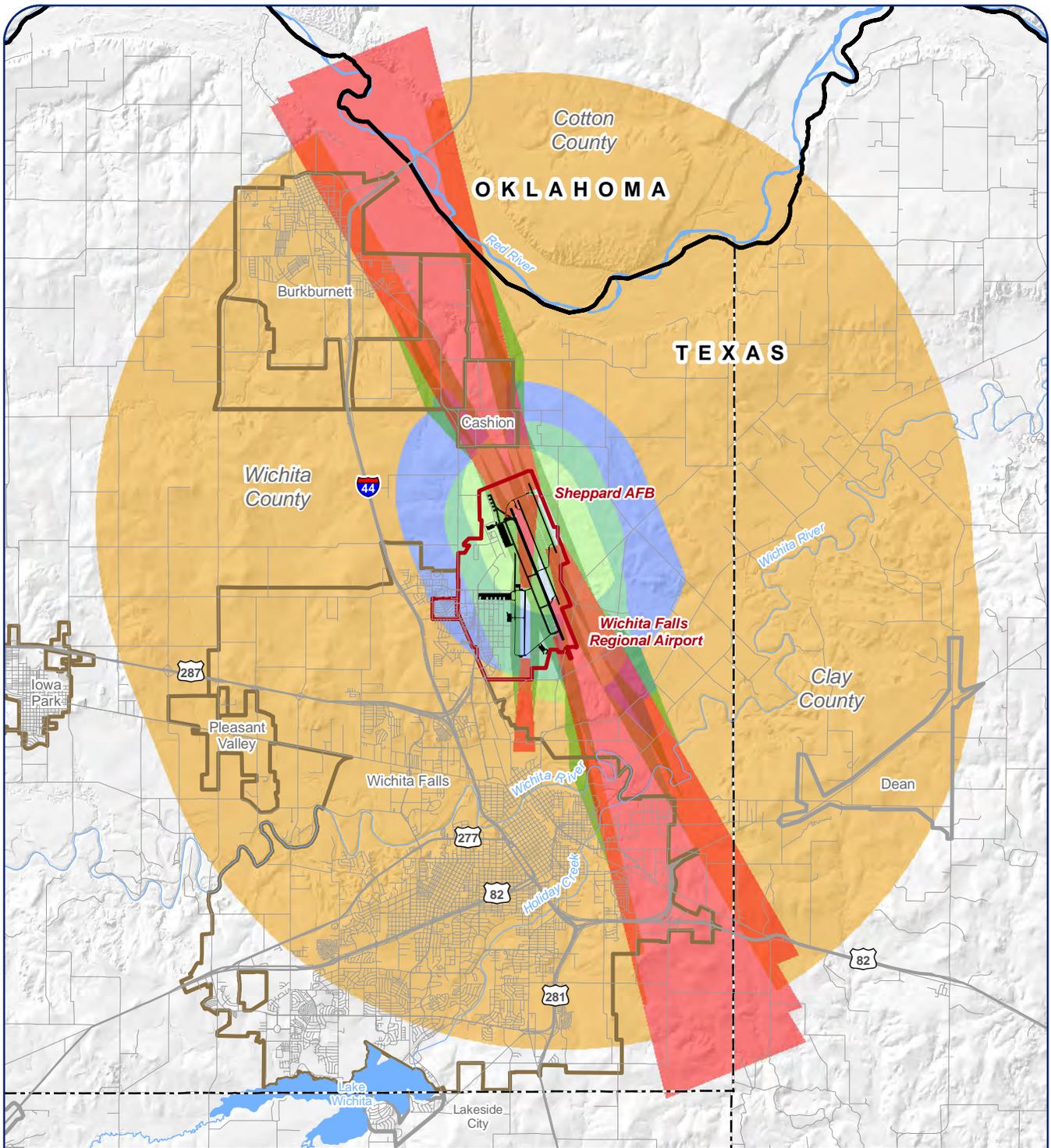
- **Primary Surface:** An imaginary surface symmetrically centered on the runway, extending 200 feet beyond each runway end that defines the limits of the obstruction clearance requirements in the vicinity of the landing area. The width of the primary surface is 1,000 feet, or 500 feet on each side of the runway centerline.
- **Approach-Departure Clearance Surface:** This 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 20,000 feet. The slope of the approach-departure clearance surface is 40:1 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 1,000 feet, flaring uniformly to a width of 16,000 feet at the end point.

The imaginary surfaces for the runways at Sheppard AFB are illustrated on Figure 3-5. Figure 3-6 illustrates a cross-section view of typical imaginary surfaces.

Safety Zones

Safety zones encompass three main components: the Clear Zone, Accident Potential Zone I, and Accident Potential Zone II (please refer to Chapter 5.3, Safety for a detailed description of these zones and what types of activities are permitted within each area.) As seen on Figure 3-7, a portion of these zones is within the Sheppard AFB fence line, but a significant portion extends into the community.

Specifically, Cashion Community sits in the footprint of these safety zones as does a section of Wichita County to the south-southeast of the installation.



Legend

Imaginary Surface

- Primary Surface
- Transitional Surface
- Inner Horizontal Surface
- Conical Surface
- Outer Horizontal Surface
- Approach-Departure Clearance Surface

- Airfield Surface / Runway
- Sheppard AFB
- State
- County

- Community Covered by JLUS
- Other Community
- Highway
- Road

- River
- Water Body



Sources: City of Wichita Falls, 2012; TNRS, 2012; OCGI, 2012, Sheppard AFB, 2012.

Figure 3-5
Sheppard AFB Mission Footprint: Imaginary Surfaces

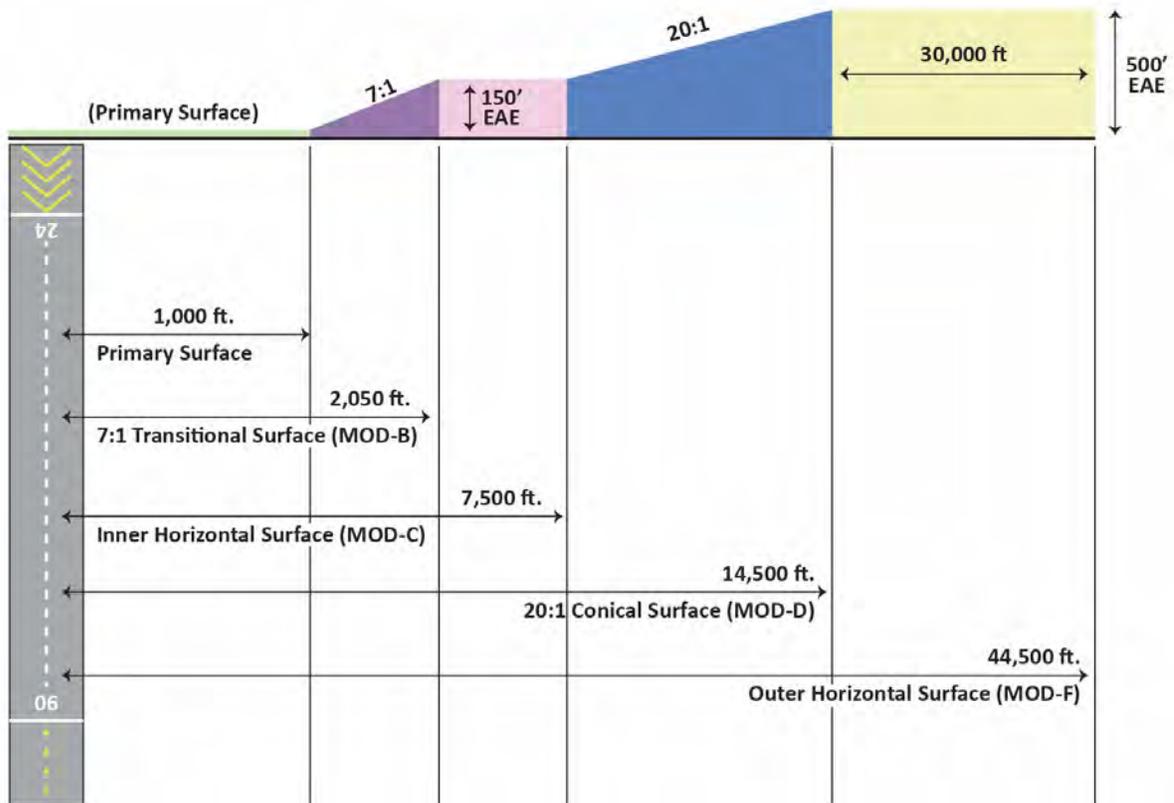
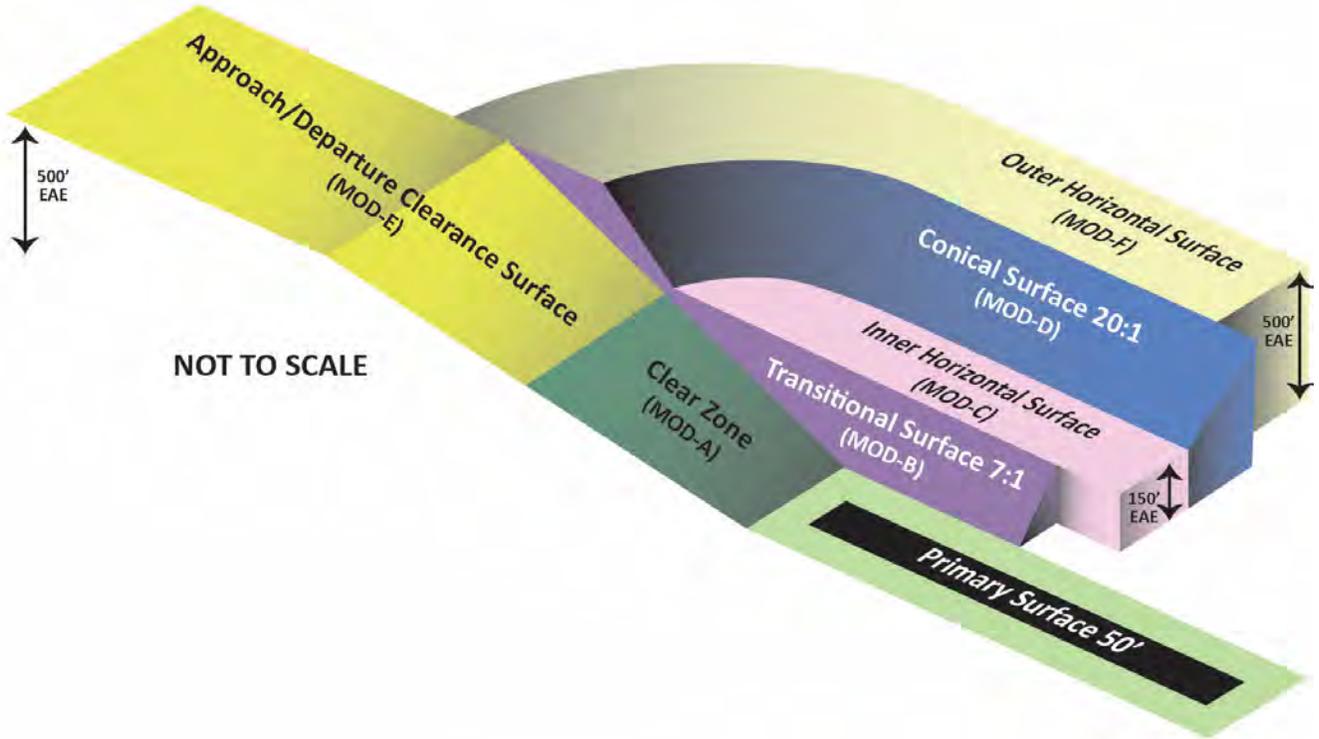
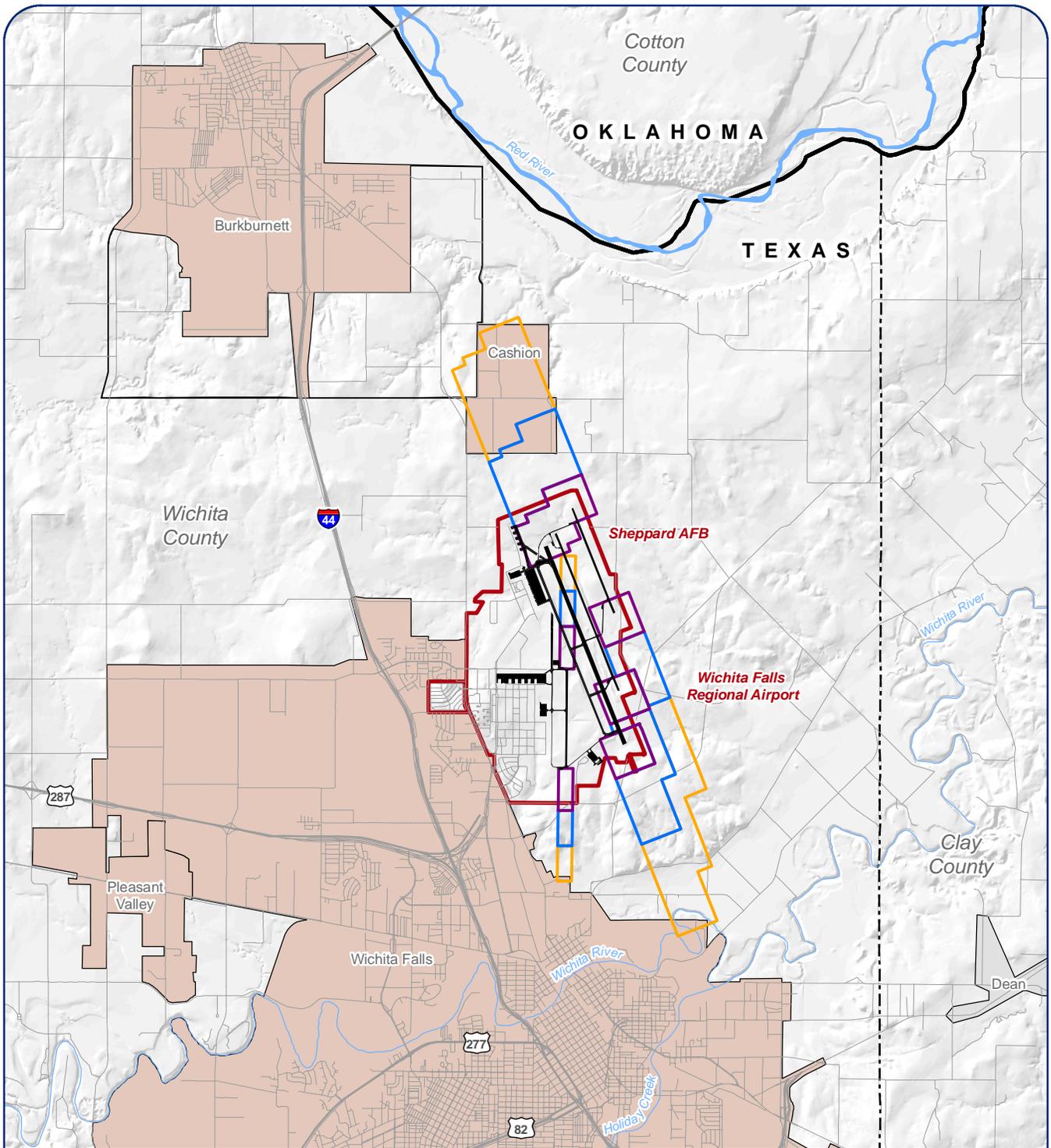


Figure 3-6. Imaginary Surfaces Cross-Section



Legend

- | | | | |
|---------------------------|---------------------------|-----------------|------------|
| Runway Safety Zone | Airfield Surface / Runway | Other Community | River |
| Clear Zone | Sheppard AFB | Highway | Water Body |
| APZ I | Community Covered by JLUS | Road | |
| APZ II | | | |

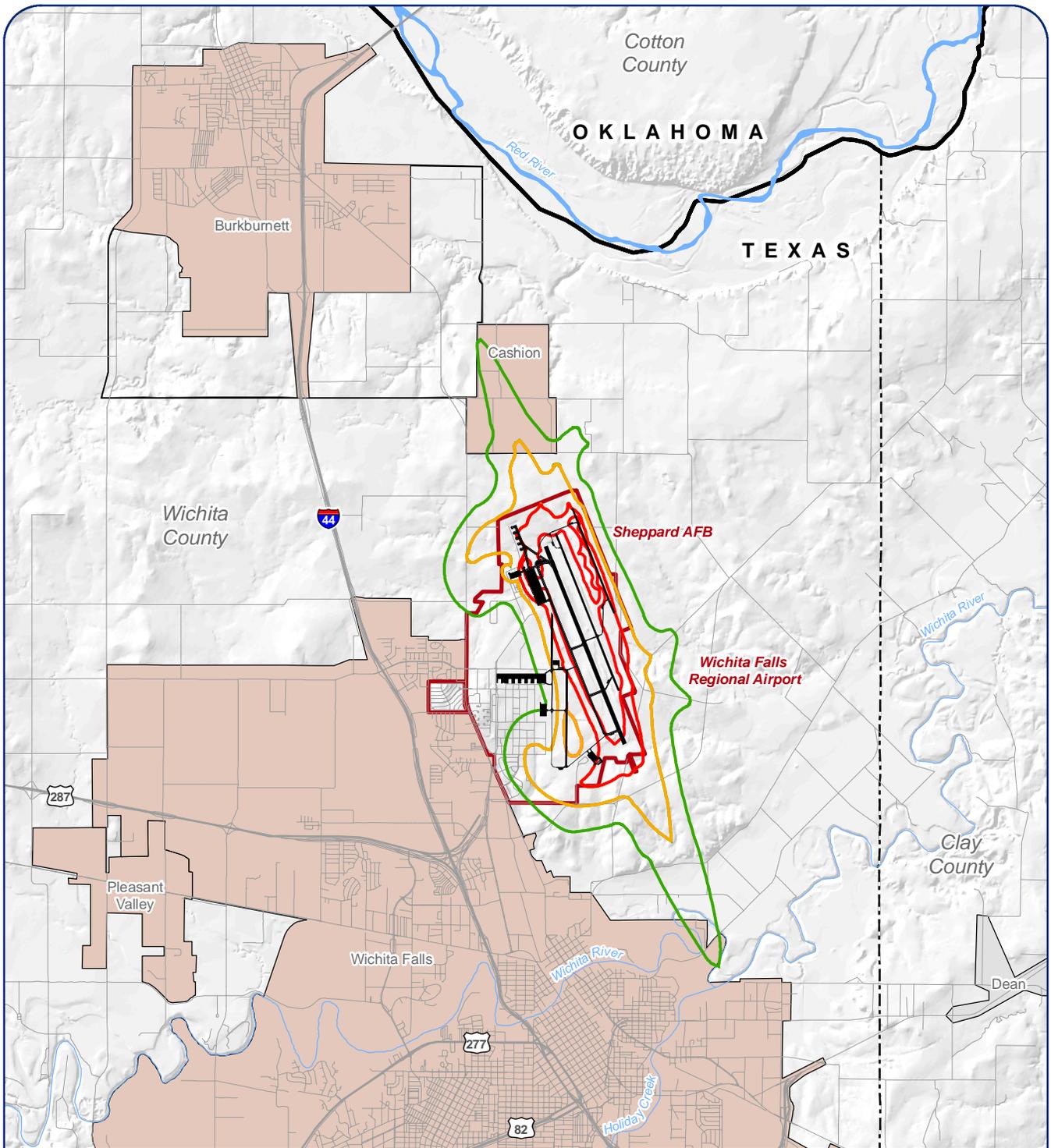


Figure 3-7
Sheppard AFB Mission Footprint: Runway Safety Zones

Sources: City of Wichita Falls, 2012; TNRS, 2012; Sheppard AFB, 2012.

Aircraft Noise

Aircraft noise is a known consequence of aircraft operations, whether they are military flights or civilian aviation. Similar to the scenario discussed in Safety Zones, the loudest noise contours generated by military aircraft operations occur within the Sheppard AFB boundary, but a portion of the noise contours extends into the community (see Figure 3-8). Specifically, a portion of Cashion Community sits within the 65 dB noise contours as does a section of Wichita County to the south-southeast of the installation and a very small portion of Wichita Falls. The impacts of being within these noise contours and mitigation strategies are discussed in far greater detail in Chapter 5.8, Noise.



Legend

- | | | | |
|-----------------------------------|---------------------------|-----------------|------------|
| AICUZ Noise Contour (2011) | Airfield Surface / Runway | Other Community | River |
| 65 dB | Sheppard AFB | Highway | Water Body |
| 70 dB | Community Covered by JLUS | Road | |
| 75 dB | | | |



Sources: City of Wichita Falls, 2012; TNRS, 2012; Sheppard AFB, 2012.

Figure 3-8
Sheppard AFB Mission Footprint: Noise Zones

3.2 Frederick Regional Airport, Oklahoma

Base History

Frederick Army Airfield was opened on September 23rd, 1942 and helped change the negative population and growth trends of both Tillman County and the City of Frederick. The airfield was constructed to aid in the war effort and was used as civil airport in joint-use agreement. It was assigned to United States Army Air Forces Gulf Coast Training Center (later Central Flying Training Command) as an advanced twin-engine pilot training airfield. Frederick Army Airfield was inactivated on October 31st, 1945 with the drawdown of the pilot training program and declared surplus and turned over to the Army Corps of Engineers on September 21st, 1946. Eventually the field was discharged to the War Assets Administration and became a civil airport.

Today, the airport is owned by the City of Frederick, which leases use of one of the runways to the Air Force. The original wooden hangar is still located on the site, and is now home to the World War II Airborne Demonstration Team Foundation and their aircraft and equipment. This group was formed to honor and serve the memory of troops who fought and died during World War II through historical parachute training and jumping in an aircraft that participated in the invasion of Europe during World War II.



Inside view of the Frederick Army Airfield hangar today

Economic Impact

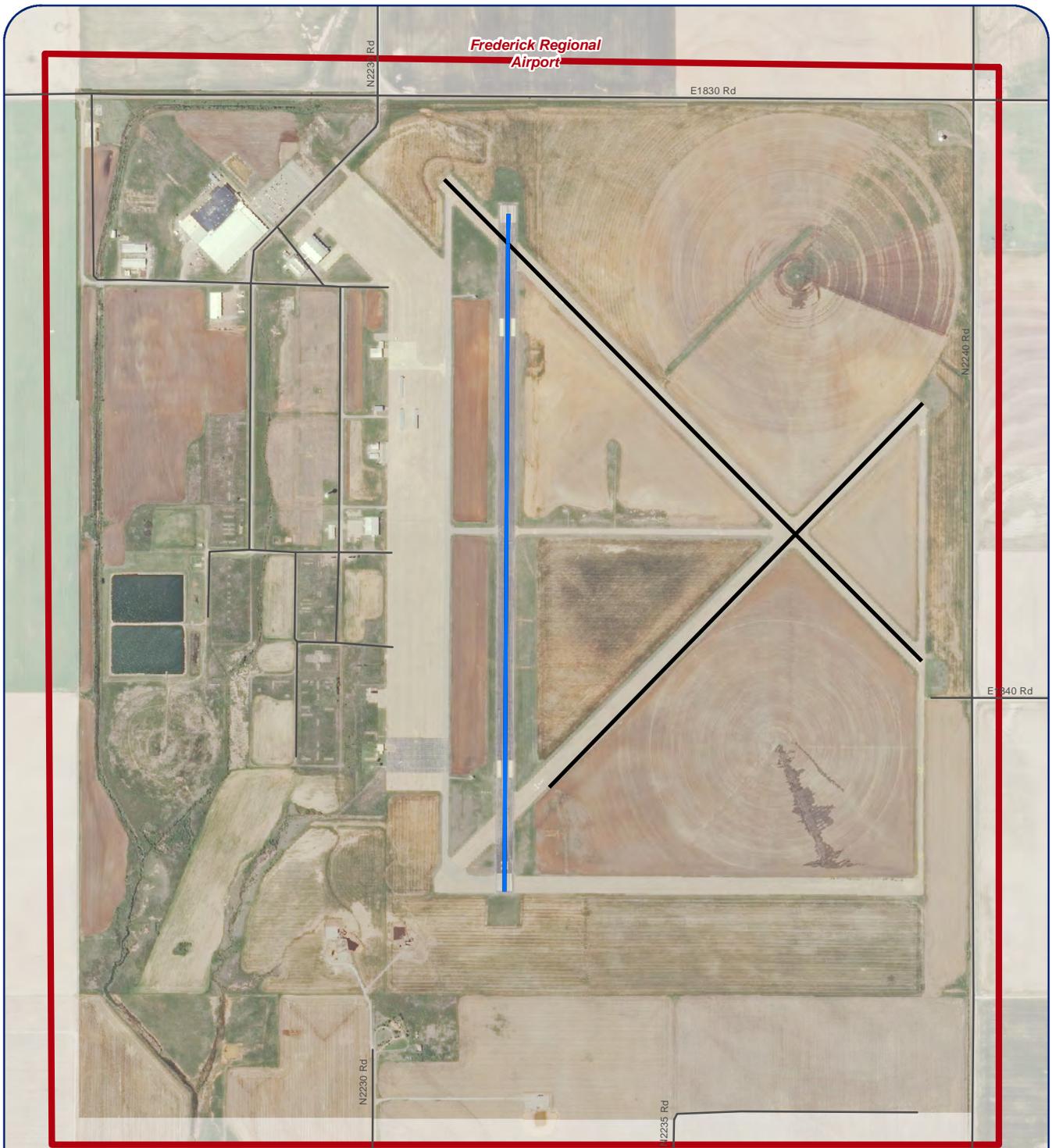
The Economic Impact to the City of Frederick and Tillman County has not been officially calculated, but Air Force operations at Frederick Regional Airport certainly offer substantial benefits to the community. In 2006, the Air Force renewed its lease agreement with the City of Frederick to use Frederick Regional Airport. The 20-year contract includes a payment of \$20,000 from the Air Force to the City of Frederick for this use. The Air Force also maintains the runway that it uses and a select number of taxiway segments. Additionally, Sheppard AFB provides runway supervisory units (RSUs) and provides manning for the fire station located on the airfield. The annual lease payments and formal agreements for “assistance-in-kind” are fundamental economic drivers keeping the Frederick Regional Airport operational.

Installation Setting



Historic Frederick Army Airfield Hangar

Frederick Regional Airport is a city-owned, public-use airport located three miles southeast of the central business district of the City of Frederick in Tillman County, Oklahoma, and approximately 57 miles northwest of Sheppard AFB. It is on land that made up Frederick Army Airfield during World War II. It is located approximately 135 miles southwest of Oklahoma City. Frederick Regional Airport covers an area of 1,442 acres, is surrounded by Tillman County, and sits near US Highway 183. Figure 3-9 provides an installation overview of Frederick Regional Airport.



Legend

- Runway Used by Sheppard AFB
- Frederick Regional Airport
- Other Airport Runway
- ∩ Road



Sources: City of Wichita Falls, 2012; OCGI, 2012.

**Figure 3-9
Frederick Regional Airport Installation Setting**

Military Operations



Plaque at Frederick Regional Airport

Frederick Regional Airport is used by Sheppard AFB T-6 trainers for high density student pilot training, which primarily includes touch-and-go landing operations. The types of patterns flown into Frederick Regional Airport include straight-in approaches, overhead patterns, and emergency landing patterns. This training is conducted on weekdays, during daylight hours, typically between 7:30 am to 5:00 pm. T-6 aircraft are controlled by the red and white RSUs at the end of runway 17R and 35L.

Frederick Regional Airport has four runways: Runway 17/35 is 6,099 feet long by 150 feet wide with an asphalt surface; Runway 3/21 is 4,812 feet long by 60 feet wide with a concrete surface; Runway 12/30 is 4,578 feet long by 75 feet wide with a concrete surface; and Runway 17L/35R is 3,180 feet long by 50 feet wide with a concrete surface. At this time, only 17/35 is used by Sheppard AFB aircraft. At the height of operations, the airport saw nearly 600 military sorties per day. Currently, there are approximately 140 sorties per day.

Projected New Missions

Sheppard AFB does not project any new missions for Frederick Regional Airport. Though no new missions are currently projected for Frederick Regional Airport, it is prudent to understand the capacity of the airport to accept new activity. Similarly, it is wise to establish compatible development options with surrounding communities to limit encroachment, which may negatively impact an airport's ability to absorb a new mission set.

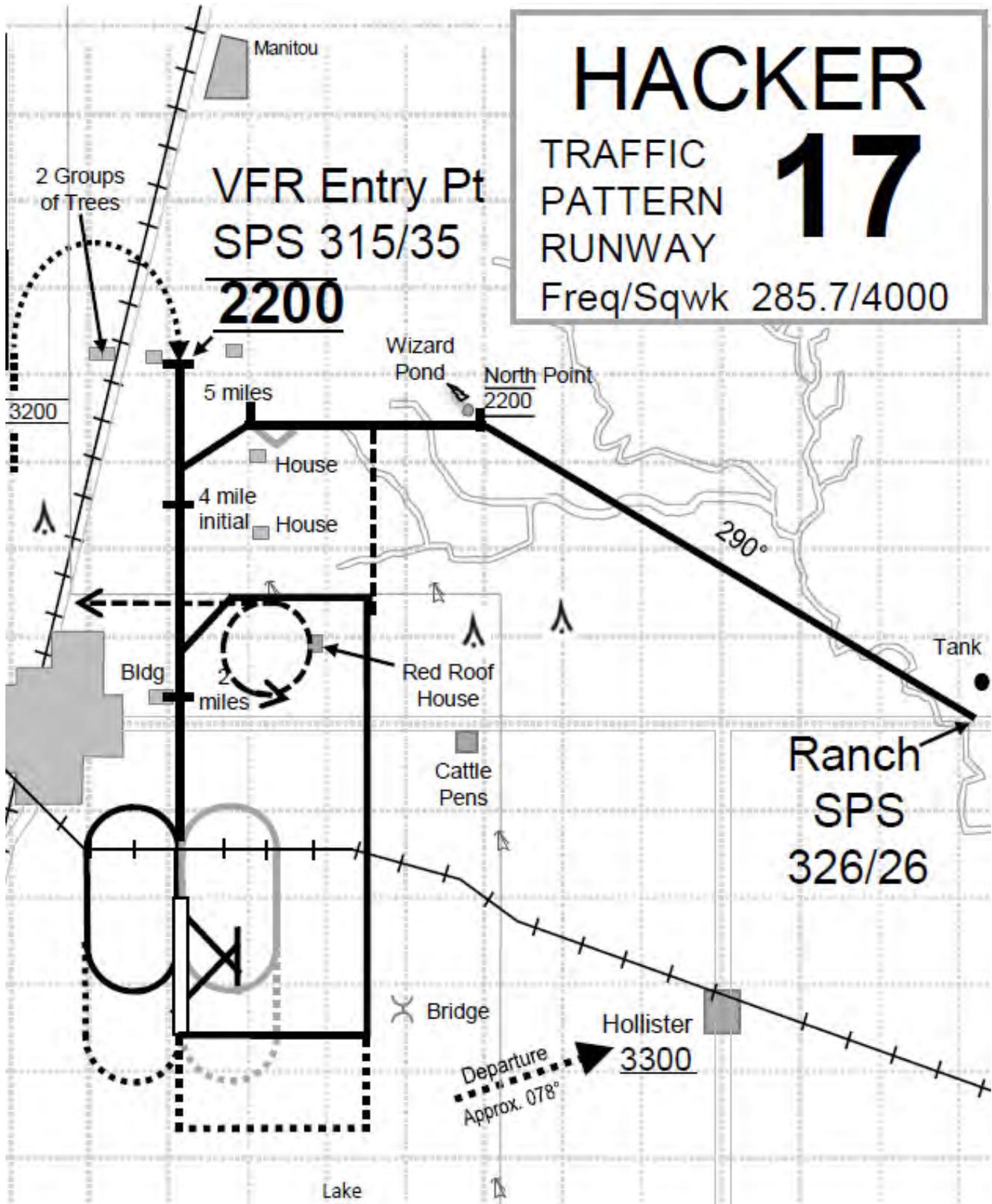
Military Mission Footprints

The military mission footprint around Frederick Regional Airport is meant to describe how military operations affect or have the potential to affect land outside of the boundaries of the airport. Frederick Regional Airport is used as an out-lying field for Sheppard AFB and the military does not conduct any ground operations which impact the surrounding community. Conversely, the daily aircraft operations of a pilot training program can have "footprint" impacts on the areas surrounding Frederick Regional Airport.

Flight Patterns

As mentioned previously, pilot training requires the designation and assignment of specific flight patterns; however, aircraft can deviate from these. Frederick Regional Airport has relatively simple flight patterns, as there are few heavily populated areas and ample airspace. Military aircraft follow specific flight patterns for approach, departure, and touch-and-go. The flight patterns avoid the City of Frederick and densely populated portions of Tillman County. The flight patterns flown at Frederick Regional Airport are referred to by Sheppard AFB personnel as "Hacker". Figure 3-10 illustrates the basic flight patterns associated with Frederick Regional Airport.

These flight patterns are not a point of concern taken in isolation, but must be considered when examining safety zones, noise contours, etc. If a deviation from the flight pattern is anticipated due to weather or any other externality, the pilot should communicate with the RSU. The RSU controls T-6 aircraft but is an advisory-only service for civilian aircraft For Frederick Regional Airport. The normal T-6 pattern altitude is 2,200' MSL and straight-ins are flown at 1,700' MSL.



Source: Sheppard Air Force Base, 2013

Figure 3-10. Frederick Regional Airport Military Flight Patterns

Safety Zones

Safety zones encompass three main components: the Clear Zone, Accident Potential Zone I, and Accident Potential Zone II (please refer to Chapter 5.26, Safety for a detailed description of these zones and what types of activities are permitted within each area.) As seen on Figure 3-11 a portion of these zones is within the Frederick Regional Airport fence line, but a significant portion extends into the community. Fortunately, the footprint of these safety zones extends mostly onto rural lands that are currently used for agricultural purposes.

Currently only Runway 17/35, the runway used by Sheppard AFB, has safety zones associated with it. For the purposes of this study, safety zones were projected for runways 3/21 and 12/30 in the event that these are used by Sheppard AFB in the future. The safety zones for these runways as shown on Figure 3-11 are the same dimensions as the safety zones for Runway 17/35. However, the actual dimensions for these safety zones, if they were to be calculated, could be smaller than the ones shown on Figure 3-11 due to the size and type of runways.

Aircraft Noise

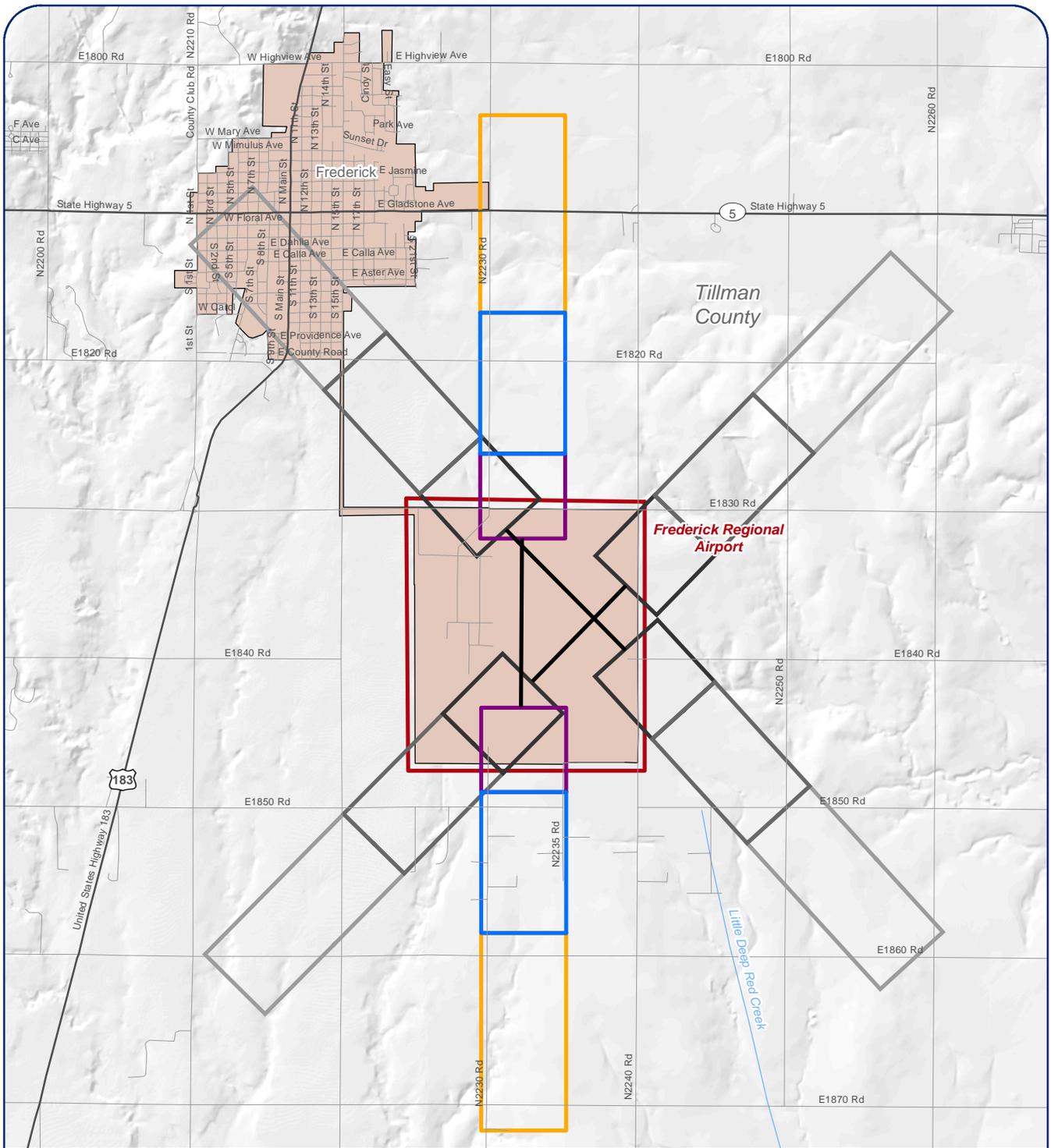
Aircraft noise is a known consequence of aircraft operations, whether they are military flights or civilian aviation. Similar to the scenario discussed in Safety Zones, the loudest noise generated by military aircraft operations occur within the Frederick Regional Airport fence line, but aircraft noise does extend past the installation boundaries. Since a noise contour map does not exist for military flight operations at Frederick Regional Airport, noise contours cannot be used to determine if any residential units exist within a 65+ dB zone.

Imaginary Surfaces

The FAA has identified certain imaginary surfaces around runways that are used to determine how structures and facilities are evaluated to identify if they pose a vertical obstruction in relation to the airspace around a runway. The different types of imaginary surfaces are described along with their dimensions starting on page 3-12. An Air Installation Compatible Use Zone (AICUZ) Study was developed for Frederick Regional Airport in 1980. While this study has not been updated since then, it provides a description of the imaginary surfaces associated with Frederick Regional Airport. According to the AICUZ, the main runway at Frederick Regional Airport has the same imaginary surface dimensions as the three main

runways at Sheppard AFB. Using this information, Figure 3-12 was developed to show the imaginary surfaces and extents associated with Frederick Regional Airport.

The other two active runways (runways 3/21 and 12/30) at Frederick Regional Airport were not included in the AICUZ study because they were not used by the military. They are currently not used for military operations either, but there is the potential for them to be used in the future. Figure 3-12 also includes estimated imaginary surfaces for these two runways. These estimated imaginary surfaces were created using the same guidelines that were used to create the imaginary surfaces for Runway 17/35, and may need to be confirmed or adjusted by the FAA or Sheppard AFB in the event that they will be used for military use.



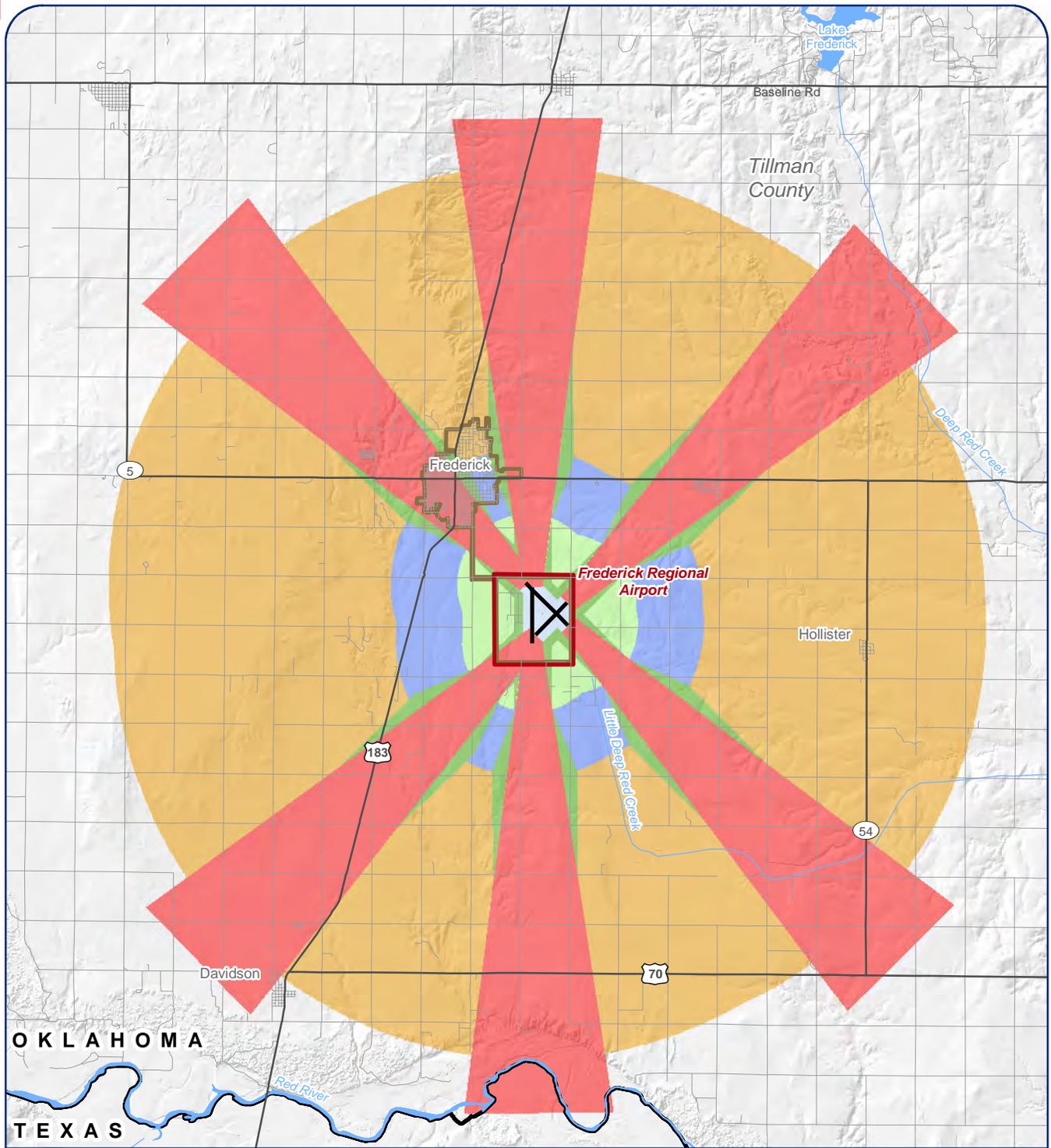
Legend

- | | | | |
|------------|----------------------|----------------------------|---------|
| Clear Zone | Estimated Clear Zone | Airport Runway | Road |
| APZ I | Estimated APZ 1 | Frederick Regional Airport | River |
| APZ II | Estimated APZ 2 | Community Covered by JLUS | Highway |



Sources: City of Wichita Falls, 2012; OCGI, 2012.

Figure 3-11
Frederick Regional Airport Mission Footprint:
Runway Safety Zones



Legend

Imaginary Surface

- Primary Surface
- Transitional Surface
- Outer Horizontal Surface
- Conical Surface
- Outer Horizontal Surface
- Approach-Departure Clearance Surface

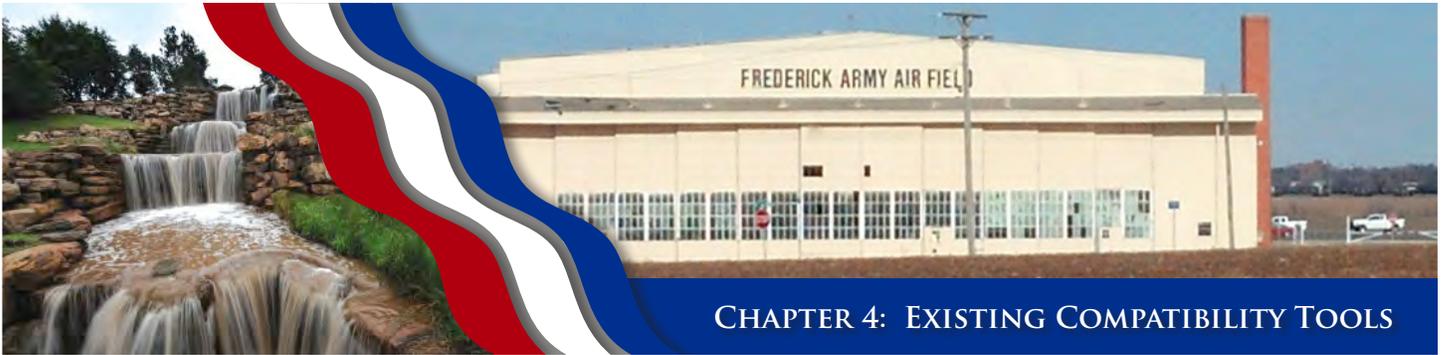
- Airport Runway
- Frederick Regional Airport
- State
- Community Covered by JLUS
- Highway
- Road
- River



0 1.5 3 Miles

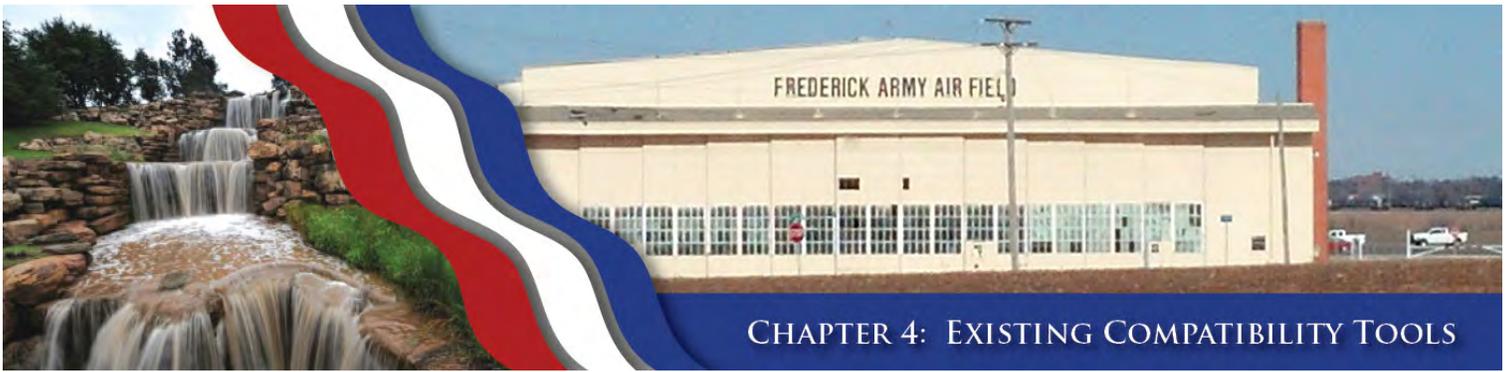
Sources: City of Wichita Falls, 2012; OCGI, 2012.

Figure 3-12
Frederick Regional Airport Mission Footprint:
Imaginary Surfaces



CHAPTER 4: EXISTING COMPATIBILITY TOOLS

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Relative to compatibility planning, there are a number of existing plans and programs that are either designed to address compatibility directly or that indirectly address compatibility issues through the topics they cover.

This chapter is broadly divided into two parts discussing Texas (Sheppard AFB) and Oklahoma (Frederick Regional Airport) providing an overview of plans and programs that are currently used or applied in evaluating and addressing compatibility issues in the Sheppard Air Force Base (SAFB) Joint Land Use Study (JLUS) area.

There are three types of planning tools that are evaluated; permanent, semi-permanent, and conditional. Permanent planning tools include acquisition programs, either fee simple purchase of property or the purchase of development rights. Semi-permanent tools include regulations such as zoning or adopted legislation. Examples of conditional tools would include memorandums of understanding, intergovernmental agreements, and other policy documents such as comprehensive plans that can be modified.

This summary provides an overview of key plans and programs that impact compatibility planning, organized by levels of government (state, local and federal). This review is meant to provide an overview of applicable planning tools and determine how each may apply to compatibility, as presented under the compatibility factors discussed in Chapter 5 of the Background Report.

4.1 State of Texas Plans and Programs.....	4-4	Comprehensive Plan	4-13
Texas Local Government Code Chapter 241, Municipal and County Zoning Authority Around Airports	4-4	Zoning.....	4-13
Airport Compatibility Guidelines	4-4	Subdivision Regulations	4-13
Texas Local Government Code Chapter 42, Extraterritorial Jurisdictions of Municipalities.....	4-4	Building Code	4-13
Texas Local Government Code Chapter 240 Outdoor Lighting	4-5	Annexation.....	4-13
Texas Local Government Code Chapter 397, Notification Requirements for Land Use Regulations.....	4-5	Acquisition	4-13
Texas Military Preparedness Commission	4-5	4.7 City of Electra, TX.....	4-14
Real Estate Disclosures.....	4-6	Comprehensive Plan / Strategic Plan.....	4-14
Texas Private Real Property Rights Preservation Act (PRPRPA), Texas Government Code §2007.001	4-6	Zoning.....	4-14
Regional Planning Tools.....	4-7	Subdivision Regulations	4-14
4.2 Texas Local Jurisdiction Planning Tools..	4-7	Building Code	4-14
Comprehensive Plans, Zoning, and Subdivision Regulations	4-7	Annexation.....	4-14
Building Code	4-8	Acquisition	4-14
Annexation	4-8	4.8 City of Iowa Park, TX	4-15
Acquisition	4-9	Comprehensive Plan	4-15
4.3 Wichita County, TX	4-10	Zoning.....	4-15
Comprehensive Plan	4-10	Subdivision Regulations	4-15
Zoning.....	4-10	Building Code	4-15
Subdivision Regulations	4-10	Annexation.....	4-15
Building Code	4-10	Acquisition	4-15
Acquisition	4-10	4.9 Town of Pleasant Valley, TX	4-15
4.4 City of Wichita Falls, TX	4-10	Comprehensive Plan	4-15
Comprehensive Plan / Land Use Element.....	4-10	Zoning.....	4-15
Comprehensive Plan / Vision 20/20	4-11	Subdivision	4-15
Zoning.....	4-11	Building Code	4-15
Subdivision Regulations	4-12	Annexation.....	4-16
Building Code	4-12	Acquisition	4-16
Annexation	4-12	4.10 State of Oklahoma Plans and Programs	4-16
Acquisition	4-12	Enabling Legislation for Cities and Counties.....	4-16
4.5 City of Burkburnett, TX.....	4-12	Oklahoma County Planning Commission and County Board of Adjustment Authorized	4-16
Comprehensive Plan	4-12	Land Use Planning Around Military Installations.....	4-16
Zoning.....	4-13	4.11 Tillman County, OK	4-17
Subdivision Regulations	4-13	Comprehensive Plan	4-17
Building Code	4-13	Zoning.....	4-17
Annexation	4-13	Subdivision Regulations	4-17
Acquisition	4-13	Building Code	4-17
4.6 City of Cashion Community, TX	4-13	Acquisition	4-17
		4.12 City of Frederick, OK.....	4-17
		Comprehensive Planning	4-17
		Zoning.....	4-17
		Subdivision Regulations	4-17
		Building Code	4-17

Annexation	4-17
Acquisition	4-17
4.13 Sheppard AFB Tools	4-17
Air Installation Compatible Use Zone (AICUZ).....	4-17
Noise Zone Profile	4-17
Accident Potential Zones (APZ)	4-18
2011 Sheppard AFB AICUZ	4-18
Bird Aircraft Strike Hazard (BASH).....	4-18
Wildlife Hazard Management Plan	4-18
4.14 Federal Programs and Policies	4-19
10 USC, Subtitle A, Part IV, Chapter 159	
§2684a.....	4-19
Clean Air Act.....	4-19
Clean Water Act (CWA).....	4-19
Endangered Species Act (ESA)	4-19
Federal Aviation Act (Title 14, Part 77).....	4-19
National Environmental Policy Act (NEPA)	4-20
Noise Control Act of 1972.....	4-21
Department of Defense Conservation Partnering Initiative	4-21
Department of Defense Readiness and Environmental Protection Initiative (REPI)	4-21
Department of Defense Energy Siting Clearinghouse.....	4-21
National Pollutant Discharge Elimination System (NPDES).....	4-21
Integrated Natural Resources Management Plan (INRMP).....	4-22
Bureau of Land Management (BLM)	4-22
US Fish and Wildlife Service (USFWS).....	4-22
Recovery Credit System (RCS).....	4-23
4.15 Other References	4-23
Guides	4-23
Videos.....	4-24

4.1 State of Texas Plans and Programs

Texas Local Government Code Chapter 241, Municipal and County Zoning Authority Around Airports

Texas Local Government Code Chapter 241 (as amended January 2013) allows jurisdictions to adopt airport zoning regulations to regulate land uses within a specific geographic area identified as the Controlled Compatible Land Use Area within unincorporated areas. Texas Local Government Code §241.013 authorizes a city or county with a population exceeding 45,000 to adopt airport zoning regulations over areas outside the city or county. Section 241.014 of the Texas State Local Government Code states that jurisdictions

“...to whose benefit an airport is used in the interest of the public or in which an airport owned or operated by a defense agency of the federal government or the state is located may create a joint airport zoning board with another political subdivision in which an airport hazard area or a controlled compatible land use area relating to the airport is located.”

Each of these entities has the power to adopt, administer, and enforce airport compatible land use zoning regulations within a statutorily defined area. As per statute, the area of authority can extend no farther than a rectangle bounded by lines located no farther than 1.5 statute miles from the centerline of an instrument or primary runway and lines located no farther than five statute miles from each end of the paved surface of an instrument or primary runway.

Additionally, entities can adopt Airport Hazard Area zoning regulations that are not limited to the 1.5 x 5 mile “rectangle”. The maximum area that can be covered in the airport hazard area is not defined, but it is generally accepted that they apply to the imaginary surfaces included in FAR Part 77.28. Airport hazard zoning regulations are broader in geographic area but narrower in permissible scope than airport compatibility zoning regulations. They are designed to protect the airport from an actual “hazard”, such as a “structure or object of natural growth that obstructs the airspace required for the taking off, landing, and flight of aircraft or that interferes with visual, radar, radio, or other systems

for tracking, acquiring data relating to, monitoring, or controlling aircraft.

The City of Wichita Falls has implemented an Airport Zoning Board and airport zoning regulations in accordance with Chapter 241. As stated in the city’s zoning ordinance, the City’s Planning and Zoning Commission is responsible for all duties and powers granted to the Board.

Airport Compatibility Guidelines

The Airport Compatibility Guidelines: Compatibility Planning, Compatible Land Use Zoning, Hazard Zoning for Airports in Texas, was published by the Texas Department of Transportation Aviation Division in January of 2003. The guidelines are a complement to the State of Texas Local Government Code Chapter 241, Municipal and County Zoning Authority around airports. The guidelines are intended to aid decision-makers on how to plan for compatibility as development occurs closer to airports. The primary tools discussed in the guidelines are Airport Compatible Land Use Zoning Ordinances and Hazard Zoning Ordinances.

The document outlines criteria for the establishment of an Airport Compatible Land Use Ordinance or a Hazard Zoning Ordinance to best support compatible development in a municipality. It also outlines preparation, such as the prerequisites, needed for implementation of Airport Compatible Land Use Zoning Ordinance and Hazard Zoning Ordinance. It also documents the procedural steps in developing and adopting an Airport Compatible Land Use Zoning Ordinance and / or a Hazard Zoning Ordinance.

Texas Local Government Code Chapter 42, Extraterritorial Jurisdictions of Municipalities

Chapter 42 of the Texas State Local Government Code, Extraterritorial Jurisdictions (ETJ) of Municipalities, designates the area beyond the municipality’s boundaries for future growth. The municipality has no zoning authority in this area (except for “Airport Zoning” pursuant to Texas Local Government Code 241), since the designated area is not incorporated into the city. However, Section 42 of the code does give a city the right to regulate the subdivision of land within the ETJ into parcels of less than five acres. The extent of the ETJ is based on the population of the municipality and as the population grows the ETJ increases, ranging from one-half mile

for municipalities with less than 5,000 inhabitants up to five miles for a municipality with 100,000 or more inhabitants. The ETJ also increases as land is annexed to the City. For the City of Wichita Falls, the ETJ is defined as the area within five miles of the current city limits.

Texas Local Government Code Chapter 240 Outdoor Lighting

Texas Local Government Code, Title 7, Subchapter B: Outdoor Lighting near Observatories and Military Installations (enacted Sept. 1, 1987; amended September 2001, May 2007, and January 2012). House Bill No. 1852 was initially passed in 2007 to preserve the dark sky environment for military operations. The bill grants Texas Counties with more than five military installations or are adjacent to counties with military bases the authority to regulate the use of lighting to mitigate interference with training activities, operations, or research within five miles of a military installation. In areas where the law is applicable, counties may specify requirements for the type of lighting allowed to control glare, setting shielding requirements, and time of usage. This statute has since been incorporated into Texas Local Government Code as Chapter 240 Subchapter B. This statute does not authorize Texas counties to regulate lighting for single family residences, agricultural activities, or correctional facilities.

Texas Local Government Code Chapter 397, Notification Requirements for Land Use Regulations

Texas Local Government Code § 397.005 requires local governments that are adjacent or near a military installation to seek comments and analysis from the base authorities concerning potential compatibility concerns when an ordinance, rule, or plan proposed by the community may impact military operations or missions associated with the installation. The local government must consider and analyze the comments and analysis before making a final determination relating to the proposed ordinance, rule, or plan.

Texas Military Preparedness Commission

In 2003, Senate Bill (SB) No. 652 established the Texas Military Preparedness Commission to give annual reports to the Governor's office concerning the operation of military installations and related community and business concerns. The Texas Military Value Revolving Loan Account was created, which

can issue up to \$250 million in general obligation (GO) bonds to assist communities with significant defense related attributes that enhance the value of their military installations and promote compatible land use. Under the law, a community near a defense installation may request financial assistance to prepare a comprehensive defense installation and community strategic impact plan that identifies the communities' long-range goals and development proposals. One objective of the plan is to better manage the effects of future community growth on military installations and their training exercise activities.

This strategic impact plan must include a detailed list of existing and future land uses around the impacted military installation. The plan must identify the proposed distribution, location, and extent of land uses such as housing, business, industry, agriculture, recreation, public facilities and grounds, and other categories of existing and proposed land use regulations such as zoning, annexation, and planning recommendations that may impact the military base. Other elements that are required in the plan include:

- Transportation: the location and extent of existing and proposed freeways, streets, roads, and other modes of transportation;
- Population: the past and anticipated population growth trends;
- Conservation: methods for conservation, development, and use of natural resources;
- Open space: an inventory of current open space, as well as an analysis of the military base's forecasted needs for open-space areas to conduct military training activities. This can include suggested strategies to transition currently developed land into open-space, if necessary;
- Restricted airspace: the creation of buffer zones, if needed, between the military installation and existing incompatible land uses; and
- Military training routes: the identification of existing routes and proposed plans for additional or revised routes.

Strategic impact plans are encouraged to be developed in coordination with the military installation into a manual based on proposals outlined in the plan

to guide future community development adjacent to the installation. Once established, frequent collaboration between the local communities and the military installation is encouraged to ensure the manual's relevance and maintenance in addressing possible concerns with the installation.

Real Estate Disclosures

Real estate disclosures are used in some Texas jurisdictions to notify potential homebuyers of conditions affecting the property that they should be aware prior to its purchase. Section 5.008 of the Texas Property Code requires real estate disclosures to be provided to the purchaser on or before the effective date of the contract binding the purchaser to purchase the property:

5.008(a) A seller of residential real property comprising not more than one dwelling unit located in this state shall give to the purchaser of the property a written notice as prescribed by this section or a written notice substantially similar to the notice prescribed the his section which contains, at a minimum, all of the items in the notice prescribed this section.

The Texas Real Estate Commission (TREC) disseminates a Seller's Disclosure of Property Condition form for use in residential real estate transactions (TREC Form No. OP-H revised in 2010) to notify a potential buyer of any conditions which may affect the long term condition of the property. Real estate disclosures are also identified in the TREC Unimproved Property Contract Form 9-10 (revised in 2012). If property reports, such as an environmental assessment, are requested by the buyer and identify conditions which adversely affect the use of the property, the buyer may terminate the contract within a mutually agreed upon timeframe.

Sellers are required to disclose certain characteristics pertaining to the location of the property such as location in a 100-year floodplain or other natural feature that may pose unique risks to the property. Additionally, disclosure is required if property is located in an area where landfill, settling, soil movement, or a fault line may be present. Although they are not currently used for this purpose in Texas, real estate disclosures can be used to notify buyers that property is in a military influence area and possible effects of that location such as lighting requirements, height limitations, required sound

attenuation for new structures, and impacts to the property such as noise.

Texas Private Real Property Rights Preservation Act (PRPRPA), Texas Government Code §2007.001

The PRPRPA was adopted by the Texas State legislature as an acknowledgement of the importance of protecting private real property interests and to ensure that certain governmental entities consider their actions on private real property rights. The PRPRPA redefines whether or not an action of the government can be considered a taking. A taking, as defined by the Act, occurs when a governmental action is a producing cause of a 25 percent or more reduction in the value of private real property affected by the governmental action. Governmental actions identified by the Act include:

- The adoption or issuance of an ordinance, rule, regulatory requirement, resolution, policy, guideline, or similar measure;
- An action that imposes a physical invasion or requires a dedication or exaction of private real property;
- An action by a municipality that has an effect on the extraterritorial jurisdiction of a municipality, and that enacts or enforces an ordinance, rule, regulation, or plan that does not impose identical requirements or restrictions on the entire extraterritorial jurisdiction of the municipality; and
- Enforcement of a governmental action, whether the enforcement of the governmental action is accomplished through the use of permitting, citations, orders, judicial or quasi-judicial proceedings, or other similar mechanisms.

A Takings Impact Assessment (TIA) is required when a governmental action is undertaken that may constitute a taking. If a governmental entity fails to undertake a TIA, the governmental action may be invalidated. The Act defines the required elements of a TIA, as well as criteria for evaluating a TIA. Most significantly, the TIA requires the governmental agency to list and evaluate potential alternatives that could accomplish the specific purpose of the action in question, and compare and evaluate the alternatives to prove that the proposed action is the best suitable option to achieve the purpose of the proposed action.

The takings clauses of the US and Texas Constitutions set forth that private property shall not be taken for a public use without just compensation. Courts have identified several relevant factors to determine a taking, such as the economic impact of the regulation, the degree to which the regulation interferes with investor-backed expectations, and the character of the government action. Some of the leading US Supreme Court cases have gone as far as stating that as long as the landowner retains some minimal economic use in his land, no compensable taking occurred. (See, *Penn Central vs. New York City*, 438 US 104 [1978] *Dolan vs. City of Tigard*, US 374 [1994], *Lucas vs. South Carolina Coastal Commission*, 505 US 1003 [1992]). In any case, any governmental entity contemplating issuing ordinance, orders or legislation to implement JLUS recommendations should consult their own legal counsel for takings analysis. Even if there is no compensable taking, the governmental entity should weigh private property rights and balance that against the benefits that the contemplated restrictions offer.

Regional Planning Tools

Regional planning is conducted by the North Texas Regional Planning Commission, State Planning Region #3. The Updated Regionally Coordinated Transportation Plan was completed in August, 2012 and is the long-range plan containing an overview of the demographics of the region, gaps, needs, mission, strategies and transportation improvement projects. The planning area for this document encompasses an 11-county area in which Wichita Falls is the only metropolitan city. The vast majority of the region is rural and access to health care, retail shopping, and other services requires traveling great distances. The strain on transportation services is increased by the maturing of the population as younger residents relocate to urban areas. This trend is expected to continue into the foreseeable future. Growth in the region's counties has either declined, remained static, or shown only a slight increase over the 10-year period ending in 2010.

4.2 Texas Local Jurisdiction Planning Tools

Comprehensive Plans, Zoning, and Subdivision Regulations

While the State of Texas does not mandate that municipalities maintain a master or comprehensive general plan, Chapter §219 of the Texas Local Government Code authorizes a municipality to create a Comprehensive Plan "for the purpose of promoting sound development of municipalities and promoting public health, safety, and welfare." Chapter §219 authorizes a municipality, without limitation, to address future land, transportation, public facilities or other topics in the Comprehensive Plan. Chapter §219.005 also requires a notation on the map of the Land Use Element of the Comprehensive Plan, stating that: "A comprehensive plan shall not constitute zoning regulations or establish zoning district boundaries."

It is important to remember that unlike counties in other states, Texas counties exert minimal regulatory authority. For example, counties do not have the power to regulate zoning on land in the county, or the use or appearance of property. Similar to cities, however, Section 232 of the Texas Local Government Code provides counties with the authority to regulate the subdivision of land. Under this authority, the focus of a county's ability to regulate the subdivision of land is limited to roads, streets, drainage, and rights-of-way. Much of the study area is excluded from municipal authority – meaning not within a city's incorporated limits. However, a significant portion of the study area is within a city's extraterritorial jurisdiction, which is an area subject to airport zoning, or a military installation, and thus is not covered by zoning regulations or comprehensive plans.

Subdivision regulation is accomplished through the review and approval of plats. In addition to their incorporated areas, cities in Texas have the authority to regulate new subdivisions in unincorporated areas within their extraterritorial jurisdiction (ETJ). Counties in Texas only have subdivision regulation authority within unincorporated areas and share this subdivision regulation authority with any city in which the land is in the city's ETJ. Subdivision regulations do not apply to:

- the use of any building or property for business, industrial, residential or other purposes;
- the bulk, height, or number of buildings constructed on a particular tract of land;
- the size of a building that can be constructed, including restrictions on the floor area ratio; or
- the number of residential units that can be built per acre of land.

Although these limitations exist, subdivision regulations can still be effectively used for compatibility planning purposes. For example, in areas without existing wastewater infrastructure, subdivision regulations might prohibit or limit the development of land, require open space set asides, or minimize the impact on a sensitive environmental area. Table 4-1 provides an overview of existing local jurisdiction planning tools in the study area. The table identifies the tool, whether it is used in a particular jurisdiction and whether or not it is effective at addressing compatibility issues between the jurisdiction and the military. The specific deficiencies are outlined in a subsequent sub section.

Building Code

Building codes are intended to regulate building construction, materials, alteration and occupancy to ensure health, safety and welfare. The building code regulates building construction such that it is compatible with military installations, including sound attenuation for residences within applicable noise zones. Building codes, similar to other regulatory tools, are considered semi-permanent.

The State of Texas has adopted various versions of the International Building Code, International Fire Code, International Plumbing Code, National Electric Code, Texas Accessibility Standards, and Energy Code, for application in unincorporated areas. However, the state does not inspect residential construction in Texas. Cities in Texas may adopt different versions of these standard codes and make local amendments to them.

See <http://www.iccsafe.org/gr/Pages/adoptions.aspx> for a list of the latest adopted codes.

Annexation

Annexation is not a tool that can be applied with immediate results. Unless petitioned by property owners, a municipality must prepare a three-year annexation plan and follow strict guidelines in order to extend its jurisdiction into unincorporated territory. Involuntary annexations of more than 100 lots must be preceded by a municipal annexation plan and guidelines. Annexation can be an important tool in addressing compatibility issues. If land is annexed, municipalities can:

- apply zoning ordinances,
- apply building permit requirements,
- apply other land use provisions (i.e. off-street parking requirements, tree clearing prohibitions, etc.), and
- criminally prosecute developers who fail to comply with zoning ordinances, building permit requirements, and other land use regulations.

Table 4-1. City and County Planning Tools

Jurisdiction	Planning Tools									
	Comprehensive Plan	Zoning Code - Height Restrictions	Zoning Code - Dark Sky	Zoning Code - Sound Attenuation	Airport Hazard Zoning Regulations	Subdivision Regulations	Master Development Plan	Building Code	Annexation	Acquisition
Wichita County, TX	N	N	N	N	N	N	N	N	N	N
City of Wichita Falls	Y	Y	N	Y	Y	Y	Y	Y	Y	Y
City of Burkburnett	Y	Y	N	N	N	Y	N	Y	N	N
City of Cashion Community	N	N	N	N	N	N	N	N	N	N
City of Electra	Y	N	N	N	N	Y	N	N	N	N
City of Iowa Park	Y	Y	N	N	N	Y	N	Y	N	N
Town of Pleasant Valley	N	N	N	N	N	N	N	N	N	N
Tillman County, OK	N	Y	N	N	N	N	N	N	N	N
City of Frederick	N	Y	N	N	Y	Y	N	Y	Y	Y

Legend: ■ = Does not adequately address compatibility
■ = Adequately addresses compatibility

Y= Yes, the jurisdiction utilizes this tool
N= No, the jurisdiction does not utilize this tool

Acquisition

When acquisition is used as a land use planning and implementation tool, property rights and/or development rights could be acquired through donation, easement or the outright purchase of property for public purposes.

Acquisition can eliminate compatibility issues that might occur through real estate transactions and the land development process. These tools are very effective because they remove the potential of incompatible land uses from critical areas and therefore achieve compatibility goals. With these tools, land use compatibility issues can be addressed by:

- Creating an undeveloped land barrier between active military installations and incompatible land uses.
- Shifting future growth away from critical military lands.
- Protecting public safety by diverting incompatible land uses to other locations.
- Protecting the natural environment.
- Maintaining and protecting existing agriculture resources.
- Conserving open space.

Acquisition may occur in several different methods: voluntary, conservation or agricultural / cattle ranching easement and fee simple acquisition (conservation partnership), described as follows:

- **Voluntary Acquisition (donation of property or development rights):** Federal legislation allows and supports a voluntary acquisition program under section 104(a) of the Aviation Safety and Noise Abatement Act of 1979. This legislation allows an airport operator (including military airports) to submit a noise compatibility program to the FAA which establishes the methods for the reduction of incompatible uses. Some properties located within Military Influence Areas (MIA) should be eligible to participate.
- **Conservation or Agricultural / Cattle Ranching Easement:** This type of easement is primarily donated or purchased. There are incentives to encourage donation by property owners of easements, including a federal income tax deduction. Easement acquisition is a more cost-effective method than outright purchase and allows the property owner to retain some of the property rights.
- **Fee Simple Acquisition (Conservation Partnering):** This is actual purchase of the property and is the most costly method of achieving compatibility goals of protecting sensitive or critical areas. The National Defense Reauthorization Act of 2003 granted authority to the Department of Defense (DOD) to “partner” with local governments and conservation organizations to assist in the acquisition of land.

Grant funding requires that the DOD identify willing sellers with property that, if acquired, would achieve the objectives of: 1) Limiting development or use of the property that would be incompatible with the mission of the installation; and 2) Preserving habitat on the property that is compatible with environmental requirements and/or may eliminate or relieve current or anticipated environmental restrictions that would or might otherwise restrict, impede, or otherwise interfere, whether directly or indirectly, with current or anticipated military training, testing or operations on the military installation. In addition, funding could be provided through the US Department of Agriculture’s Farms and Ranch Lands Protection Program (FRLPP) and the Texas Military Revolving Loan Fund Program.

4.3 Wichita County, TX

Comprehensive Plan

Wichita County has not adopted a comprehensive plan.

Zoning

Wichita County does not have authority to implement zoning.

Subdivision Regulations

Wichita County has not adopted subdivision regulations.

Building Code

Wichita County has not adopted a building code.

Acquisition

It is unknown whether Wichita County has utilized acquisition to further the goals of compatibility with military facilities and mission sustainment.

4.4 City of Wichita Falls, TX

Comprehensive Plan / Land Use Element

According to Texas Local Government Code §211.004, in Texas, cities may only enact zoning in accordance with a comprehensive plan (CP). The City of Wichita Falls conforms its zoning to the Land Use Plan (LUP) element of its CP. The LUP is regularly modified to ensure the zoning ordinance continues to comply with the CP.

The CP is the guiding document for land use decision-making and provides the goal topic, the objectives and policies that should be kept in mind when making land use-related decisions. It broadly divides these goals and objectives into residential, non-residential and special land use topics.

However, with the exception of the LUP element, the CP has not been updated since 1984 and predates the establishment of zoning in Wichita Falls. Now that Wichita Falls has operated for almost 30 years under zoning, the CP should be updated to incorporate planning objectives for future development.

Comprehensive Plan / Vision 20/20

Vision 20/20 is not so much a comprehensive plan for Wichita Falls as it is a regional strategic economic plan in preparation and in anticipation of job losses at SAFB due to base realignment. The 2005 round of the Base Realignment and Closure (BRAC) Commission's recommendations resulted in the transfer of Sheppard AFB's medical training missions to San Antonio's Fort Sam Houston. This resulted in the loss of approximately 1,990 jobs and students. Furthermore, the reduction in personnel at Sheppard had a negative impact on the base's economic impact to the regional community, which dropped by more than \$103 million from 2009 to 2012. This reduction was not due solely to the loss of medical training missions and associated personnel and students, but it did play a factor. The BRAC decisions also resulted in the relocation of the Air Force Joint Strike Fighter Initial Joint Training Site to Eglin AFB in Florida, which was previously planned to be located at Sheppard AFB. The relocation of this mission also had economic impacts on Sheppard AFB and the surrounding region.

However, the plan identifies strategies for diversifying the regional economy, guiding development, addressing community image, revitalization of the downtown area, enhancing the City's ability to compete and, it incorporates existing plans related to these efforts.

The plan includes the Defense Diversification Plan (2008) with appendices. The plan outlines strategies to implement that are intended to strengthen Wichita Falls' primary economic development assets and promote economic diversification. While it may appear as if the plan is focused on Wichita Falls alone, the plan states,

"...it is imperative that the communities in the region, including Wichita Falls, Burkburnett, and Iowa Park, recognize the important role that Sheppard plays in the region. They must be vigilant in recognizing both the community and economic impact Sheppard has on the region and in visibly supporting the needs of the training missions stationed at the base. The region needs to continue and even strengthen their support of the base and advocate new missions to promote growth at the base. These actions will hopefully avoid potential surprises as a result of future base realignment studies."

It therefore calls for regional input and support, a good example of cooperative, collaborative regional planning in practice.

Zoning

The City Wichita Falls Zoning Ordinance 38-85 (as amended) divides the land within the City into fifteen districts, with five of these classified as special purpose zoning districts, and provides typical development provisions for the districts, including lot dimension requirements, lot area, parking and height limitations. Four districts specify "no maximum height". These are the General Commercial, Light Industrial, Heavy Industrial and the Central Business District. The rationale may be that the Airport Zoning areas (which function much like an overlay district) in proximity to the airport and SAFB adequately address the issue of height. The other districts allow structures up to 45 feet in height.

The City of Wichita Falls zoning ordinance includes provisions for Airport Zoning (but no stand-alone provisions for military, though SAFB is included) within Section VI, General Regulations (Sec. 6400). The airport zoning section applies to the land area within the city and its ETJ, SAFB, the Wichita Falls Regional Airport and the Kickapoo Downtown Airport. The Airport Zoning Regulations establish Accident Potential Zones, Noise Zones, and Height Restriction Zones around Sheppard AFB that are based on the related areas (Accident Potential Zones, Noise Contours, and Imaginary Surfaces, respectively) identified within the AICUZ. Height Restriction Zones are also established around Kickapoo Downtown Airport. The zoning regulations rely on the AICUZ compatibility table for the allowable uses within the described zones and require sound attenuation measures or a noise level reduction (NLR) in decibels (dB) in the zones as follows:

A= (DNL 66-70)

B= (DNL 71-75)

C = (DNL 76-80)

Subdivision Regulations

The city regulates the subdivision of land within the corporate limits and ETJ. The subdivision ordinance is similar to other jurisdictions within the study area. Platting, permitting, and inspections standards remain similar to other incorporated areas. Cities in Texas do not have the authority to restrict land uses via subdivision development regulations within the ETJ. However, subdivision regulations may assist in controlling density adjacent to the installation.

The City of Wichita Falls restricts land use in its ETJ around Sheppard AFB through the application of its airport zoning regulations. It does not have subdivision development regulations that are targeted at development near Sheppard AFB.

Building Code

The City of Wichita Falls has adopted the 2009 versions of the International Residential Code, International Building Code, and Existing Building Code. These codes contain guidelines relating to the transmission of sound. Section 1207 of the International Building Code provides sound transmission criteria for construction within the City.

Annexation

Chapter 43 of the Texas Local Government Code requires each city to (1) adopt an annexation plan and (2) include all areas in the plan that the city plans to involuntarily annex that contain more than 100 tracts of land containing residential dwellings. Since the passage of the annexation plan requirement, the City of Wichita Falls has not encountered growth in neighboring areas at a level that would create a reason for it to annex more than 100 tracts of land. Consequently in 1999, the City of Wichita Falls passed Resolution 145-99 that adopted an annexation plan declaring that the city did not intend to annex any area requiring an annexation plan. This resolution was merely passed to comply with a state law that required an annexation plan. This resolution does not bind future City Councils. At any time, the City can approve an annexation plan and annex tracts of land containing more than 100 tracts. Municipal annexation of land would probably spur growth in an annexed area, as it would be accompanied by a City obligation to provide water supply infrastructure in accordance with a service plan adopted incident to the annexation.

The City of Wichita Falls has maintained a steady and stable population base since achieving its population level of 100,000 in 1960. Therefore, it is unlikely that the City will need to adopt an annexation plan in the near or mid-term future.

Acquisition

It is unknown whether the City of Wichita Falls has utilized acquisition to further the goals of compatibility with military facilities and mission sustainment.

4.5 City of Burkburnett, TX

Comprehensive Plan

The City of Burkburnett adopted its CP in February, 2000. The CP contains an overview, baseline analysis (including existing land use), goals and objectives, and elements for traffic circulation, parks, recreation and open space, housing, public facilities, future land use, environmental quality and appearance and implementation strategies.

The CP functions as the long-range guide for future growth, development and redevelopment of the community typically over a ten, twenty or twenty-five year period (the CP does not specify) and is to be used as a guide in land use decision-making while serving as a vision of the city's future physical form. Once adopted, the CP becomes official policy of the city. The CP considers the goals and objectives section the most important component of the plan, as it establishes the general direction of the city for the planning period.

- The CP recognizes the economic impact of SAFB.
- The CP is outdated in some respects as it reflects a time period prior to 2000.
- The CP does not address compatibility with SAFB.

Zoning

The City of Burkburnett's Zoning Ordinance (# 589), adopted in April, 2000, establishes twelve districts with three of those as overlay districts and provides typical development provisions for the districts, including lot dimension requirements, lot area, parking and height limitations. All districts allow up to 50 feet for appurtenances and 60 feet for antennas. The Commercial / Business District allows eight stories in height and the Industrial district allows 45 feet for occupied structures, 60 feet for unoccupied structures. A communications tower may exceed the height limitations upon approval of a Specific Use Provision.

The zoning regulations do not include airport zoning provisions.

Subdivision Regulations

Burkburnett regulates the subdivision of land within the corporate limits and its one mile extraterritorial jurisdiction. The city also has an agreement with the City of Wichita Falls as to extent of its shared ETJ border with Wichita Falls. The subdivision ordinance is similar to other jurisdictions within the study area. Platting, permitting, and inspections standards remain similar to other incorporated areas. Cities in Texas do not have the authority to restrict land uses within the ETJ. Similar to zoning regulations, subdivision regulations may assist in controlling density adjacent to the installation. A review of the existing deficiencies is presented below:

- Subdivision regulations cannot be used to control land use, lot size or density.
- Subdivision regulations in Burkburnett do not offer incentives for desired development near military installations.
- Compatibility issues such as notification to property owners purchasing within proximity to a military installation, or sound attenuation standards are not addressed.

Building Code

The City of Burkburnett has adopted the series of 2000 International Building Codes (most recent edition) and incorporated them into the municipal code. These include the Residential One / Two Family Dwellings and the Building Code. These codes do not address sound attenuation.

Annexation

It is unknown whether the City of Burkburnett has utilized annexation to further the goals of compatibility with military facilities and mission sustainment.

Acquisition

It is unknown whether the City of Burkburnett has utilized acquisition to further the goals of compatibility with military facilities and mission sustainment.

4.6 City of Cashion Community, TX

Comprehensive Plan

The City of Cashion Community has not adopted a comprehensive plan.

Zoning

The City of Cashion Community has not implemented zoning.

Subdivision Regulations

The City of Cashion Community has not adopted subdivision regulations.

Building Code

The City of Cashion Community has not adopted a building code.

Annexation

It is unknown whether the City of Cashion Community has utilized annexation to further the goals of compatibility with military facilities and mission sustainment.

Acquisition

It is unknown whether the City of Cashion Community has utilized acquisition to further the goals of compatibility with military facilities and mission sustainment.

4.7 City of Electra, TX

Comprehensive Plan / Strategic Plan

The City of Electra's adopted CP dates from August 1965. The CP contains a summary of previous reports and studies including baseline information, land use, housing analysis, thoroughfare studies, community facilities, capital improvements, capital improvements and administrative controls.

The city's CP functions as the long-range outlook for future growth, development and redevelopment of the community through a specified timeframe, typically over a ten, twenty or twenty-five year period (though not specified) and is to be used as a guide in land use decision-making while serving as a vision of the city's future physical form. Based on this alone, it is obvious the plan is in need of a complete update.

Once adopted, the CP becomes official policy of the city. The CP considers the goals and objectives section the most important component of the plan, as it establishes the general direction of the city for the planning period.

- The CP does not recognize the economic impact of SAFB.
- The CP is outdated in most all respects as it reflects a planning period from 1965 to 1985.
- Many of the issues identified in the 1965 CP are still relevant, but are not addressed within the context of current realities.
- The CP does not address compatibility with SAFB.

The City of Electra completed a Strategic Plan in 2011. While this plan is not a comprehensive plan, it is an initial step in developing a community-minded effort to retain and recruit businesses and residents. However, there is no mention of SAFB and its contributions to the community.

Zoning

The City of Electra has not implemented zoning.

Subdivision Regulations

The City of Electra adopted subdivision regulations in 2006 which are consistent with the Texas Local Government Code, Chapter 212 and applies only to land where a subdivision of two or more lots of five acres or less is intended for residential purposes.

The ordinance specifies that the "Model Subdivision Rules" are adopted within the city and its ETJ. The regulations require the minimum for the purposes of allowing the city to participate in the Texas Community Development Program Fund and for the purposes of establishing minimum standards for water and wastewater facilities for residential development. The regulations specify the submittal requirements and the approval process, setbacks, water and wastewater standards, financial guarantees and number of units per lot. A review of the existing deficiencies is presented below:

- Subdivision regulations cannot be used to control land use, lot size or density.
- Compatibility issues such as notification to property owners purchasing within proximity to a military installation, or sound attenuation standards are not addressed.

Building Code

The City of Electra utilizes the 2006 International Property Maintenance Code. It is not clear if this code has actually been adopted. This is not a building code regulating the construction of buildings, but rather an enforcement tool for the proper maintenance of existing structures. This code does not address sound attenuation.

Annexation

The city has declined from a population of 6,500 in the mid-1930s to less than 3,000 today. There would not seem to be the need to annex additional land for the foreseeable future.

It is unknown whether the City of Electra has utilized annexation to further the goals of compatibility with military facilities and mission sustainment.

Acquisition

It is unknown whether the City of Electra has utilized acquisition to further the goals of compatibility with military facilities and mission sustainment.

4.8 City of Iowa Park, TX

Comprehensive Plan

The City of Iowa Park approved a comprehensive plan in May 1969, but a complete copy of the plan was not available from the city, so the contents of the plan are unclear.

Zoning

The City of Iowa Park adopted its zoning ordinance (#155) in June, 1970, amended through 2004. The ordinance divides the community into 14 districts, with three of those being special districts and provides typical development provisions for the districts, including lot dimension requirements, lot area, parking and height limitations.

The majority of districts allow a height of 35 feet for the primary structure, with no mention of appurtenances and antennae. The Commercial General District, Light Industrial, Heavy Industrial, Public Use, Special Public Use Planned Development and the Floodway Supplemental District do not specify a height limitation. Communication towers, antennae, or other uninhabitable structures are not discussed.

The zoning regulations do not include airport zoning provisions or provisions related to military compatibility.

Subdivision Regulations

The Subdivision Regulations (Ordinance # 138) were adopted in 1969 as revised through 2004, and are found in Chapter 10 of the Iowa Park Code of Ordinances. The regulations set forth standards for the subdivision of land. Provisions for the subdivision platting process, inspections, variances, and parks and public areas are included in Chapter 10, as well as design criteria for streets, alleys, sewers and drainage structures within the city and within its ETJ. A review of the existing deficiencies is presented below:

- Subdivision regulations cannot be used to control land use, lot size or density.
- Subdivision regulations in Iowa Park do not offer incentives for desired development near military installations.

- Compatibility issues such as notification to property owners purchasing within proximity to a military installation, or sound attenuation standards are not addressed.

Building Code

The City of Iowa Park has adopted the series of 2000 International Building Codes and incorporated them into the municipal code. These include the Residential One / Two Family Dwellings (IRC 2009) and the Building Code (IBC 2009). These codes do not address sound attenuation.

Annexation

Iowa Park did not have annexation authority until 2009 when it adopted Home Rule. The city has not indicated a desire to create an annexation plan, and instead prefers all annexations to be at the request of the property owner (petitioned). It is unknown whether the City of Iowa Park has utilized annexation to further the goals of compatibility with military facilities and mission sustainment.

Acquisition

It is unknown whether the City of Iowa Park has utilized acquisition to further the goals of compatibility with military facilities and mission sustainment.

4.9 Town of Pleasant Valley, TX

Comprehensive Plan

The Town of Pleasant Valley has not adopted a comprehensive plan.

Zoning

The Town of Pleasant Valley has not implemented zoning.

Subdivision

The Town of Pleasant Valley has not adopted subdivision regulations.

Building Code

The Town of Pleasant Valley has not adopted a building code.

Annexation

It is unknown whether the Town of Pleasant Valley has utilized annexation to further the goals of compatibility with military facilities and mission sustainment.

Acquisition

It is unknown whether the Town of Pleasant Valley has utilized acquisition to further the goals of compatibility with military facilities and mission sustainment.

4.10 State of Oklahoma Plans and Programs

Enabling Legislation for Cities and Counties

As far back as 1923, section 401-425 of Title 11 of the Oklahoma statutes authorized the establishment of a city planning commission and a zoning commission.

Oklahoma County Planning Commission and County Board of Adjustment Authorized

In 1970, the State of Oklahoma created Statute Section 865.51 which empowered any county in the state to appoint a planning commission and a board of adjustment for the purpose of county planning in a manner as provided in the statutes. The statutes provide the means to establish county planning but do not mandate it.

Land Use Planning Around Military Installations

Okla. Rev. Stat. § 11-43-101.1 (HB 2472, 2004; HB 2115, 2002; SB 658, 2001) permits any municipality that has an active-duty United States Air Force base to "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."

The statute specifies that the city's 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 an combination of those governmental entities."

Further, it requires the ordinance to:

- Restrict or prohibit future uses that violate the height restriction of any Federal Aviation Regulation criteria;
- Consider the recommendations or studies in order to protect the public and provide for safe aircraft operations;
- Subject to the provisions and requirements above, not prohibit single-family residential uses on an acre or more if future construction complies with "Guidelines for the Sound Insulation of Residences Exposed to Aircraft Operations", Wyle Research Report WR 89-7.
- Specifically, the ordinance shall restrict or prohibit future land uses that meet the following categories within the five-mile area:
 - Uses that interfere or impair visibility with the operation of aircraft by releasing substances such as steam, dust or smoke into the air unless the substance is generated from an agricultural use;
 - Uses that interfere with pilot vision by producing light emissions (direct, indirect or reflective);
 - Uses that interfere with aircraft communications systems or navigational equipment by producing electrical emissions;
 - Uses that attract birds or waterfowl (such as sanitary landfill operations, maintenance of feeding stations);
 - Structures within ten feet of aircraft approach, departure, or transitional surfaces;
 - Expose persons to noise greater than seventy-five decibels.

4.11 Tillman County, OK

Comprehensive Plan

Tillman County has not adopted a comprehensive plan.

Zoning

Tillman County has not implemented zoning.

Subdivision Regulations

Tillman County has not adopted subdivision regulations.

Building Code

Tillman County has not adopted a building code.

Acquisition

It is unknown whether Tillman County has utilized acquisition to further the goals of compatibility with military facilities and mission sustainment.

4.12 City of Frederick, OK

Comprehensive Planning

The City of Frederick has not adopted a comprehensive plan.

Zoning

As authorized by 1971 Oklahoma Statutes 101-115, Title 3 and HB 359 (1945), the City of Frederick adopted airport zoning in October 1980. Known as the Frederick Regional Airport Hazard Zoning Ordinance, it limits the height of structures and objects of natural growth within the airport environs (approach surfaces/zones, horizontal and conical surfaces/zones, and transitional surfaces/zones). Also, codified in Section 12-295 to 299 of the city's code of ordinances, the airport is zoned as a Heavy Industry District, though "airport" is not a specified use.

Subdivision Regulations

The City of Frederick utilizes subdivision regulations to guide the division of land into two or more tracts, lots, sites, or parcels, any part of which, when subdivided, shall contain less than 10 acres in area. The Subdivision Regulations were adopted in September 1978. They include regulations for streets, alleys, easements, public areas and open spaces, sidewalks, water lines, sanitary sewers, and storm

sewers and drainage. A review of the existing deficiencies is presented below:

- Subdivision regulations cannot be used to control land use, lot size or density.
- Compatibility issues such as sound attenuation standards are not addressed.

Building Code

The City of Frederick has adopted the 2006 edition of the International Building Code and incorporated it into the city's municipal code. This code does not address sound attenuation to protect against aircraft sound near airports.

Annexation

The City of Frederick has utilized annexation in the past to annex the Frederick Regional Airport into the city limits. Ordinance No. 589 was approved on June 25, 1995 that annexed the entirety of the airport property. This was done so that the airport would be under the same zoning regulations as the rest of the city.

Acquisition

As described above, the City of Frederick has utilized acquisition in the past to annex Frederick Regional Airport into its city limits.

4.13 Sheppard AFB Tools

Air Installation Compatible Use Zone (AICUZ)

The purpose of the DOD long-standing AICUZ program is to promote compatible land development in areas subject to increased noise exposure and accident potential due to aircraft operations. In addition, the AICUZ program's goal is to protect military airfields (and the navigable airspace leading to them) from encroachment by incompatible uses and structures.

Noise Zone Profile

Noise is the cornerstone of the AICUZ study. The noise generated by military aircraft operations and the effects of that noise on local communities are presented in a variety of ways in the study (i.e., written text, graphically, etc.). To fully appreciate the findings and recommendations presented in the AICUZ study, it is beneficial to provide an understanding of how military aircraft noise is measured, evaluated, and

graphically illustrated. Day night average sound level or DNL is a measure of noise commonly used surrounding a military installation. The main sources of noise at airfields are flight operations, which include take-offs, landings, touch-and-go operations, and engine maintenance run-ups. The Air Force considers how its operations impact the local community by calculating the day-night average sound level (DNL). The DNL averages the noise levels of all aircraft operations that occur within a 24-hour period. The DNL is depicted as a contour around a noise source connecting points of equal value, usually in 5-dB increments. An explanation of noise levels and noise measurements is more fully provided in Section 5 of the Background Report.

Accident Potential Zones (APZ)

As part of the AICUZ program, and to aid in land use planning surrounding military bases, the DOD established Accident Potential Zones (APZs). These are defined as Clear Zones (CZ), Accident Potential Zone I (APZ I), and Accident Potential Zone II (APZ II). These zones are determined using a statistical analysis of all DOD aircraft accidents. APZs follow departure, arrival, and pattern flight tracks and are based on historical data. The Clear Zone is a square area that extends directly beyond the end of the runway and outward along the extended runway center line.

2011 Sheppard AFB AICUZ

The previous AICUZ Study for Sheppard AFB was prepared in 1999. The June 2011 SAFB AICUZ study was prepared to update information on base aircraft operations since the 1999 AICUZ study. The AICUZ defines noise contours and accident potential zones (APZs) based on sustaining the existing mission, aircraft and operational levels. The AICUZ update resulted in smaller noise contours than the 1999 AICUZ for several reasons, the primary reason being the replacement of the previous T-37 aircraft with the quieter T-6 aircraft. Other factors that resulted in a reduced noise footprint were: a decrease in the number of aircraft operations at Sheppard AFB, the modifications of the T-38A to T-38C, and technical improvements to the NOISEMAP computer modeling program used to develop noise contours.

Bird Aircraft Strike Hazard (BASH)

A Bird Aircraft Strike Hazard (BASH) is designed to minimize wildlife and bird strike damage to military aircraft. A BASH plan is designed to control birds, alert aircrew and operations personnel, and provide increased levels of flight safety, especially during the critical phases of flight, take-off and landing operations. Specifically, the plan is designed to:

- Designate a Bird Hazard Warning Group (BHWG) and outline the members' responsibilities.
- Establish procedures to identify high hazard situations and establish aircraft and airfield operating procedures to avoid these situations.
- Ensure that all permanent and transient aircrews are aware of bird hazards and the procedures for avoidance.
- Develop guidelines to decrease the attractiveness of the airfield to birds and disperse the number of birds on the airfield.

Wildlife Hazard Management Plan

The Federal Aviation Administration (FAA) requires certified airports to conduct a Wildlife Hazards Assessment if they experience a triggering event as outlined in Part 139.337 (b):

- An air carrier experiences multiple wildlife strikes;
- An air carrier aircraft experiences substantial damage from striking wildlife;
- An air carrier aircraft experiences an engine ingestion of wildlife;
- Wildlife of a size, or in numbers, capable of causing any of the items described above.

If determined necessary through the results of the assessment, an airport must then develop a follow-on Wildlife Hazard Management Plan (WHMP) in order to assess and manage potential hazards resulting from bird strikes.

Other than the facilities at SAFB, the only airport discussed in the study area is the Frederick Regional Airport, a general aviation airport, owned and operated by the City of Frederick, Oklahoma, and located three miles southeast of Frederick and approximately 38 nautical miles NW of SAFB. This airport does not have scheduled service, is open only

during daylight hours, is host to SAFB student pilots for training purposes and is utilized as a SAFB Auxiliary Landing Facility. Because the airport does not have air carrier service, it would not necessarily be required to prepare a WHMP.

4.14 Federal Programs and Policies

This section consists of an overview of federal plans and programs and other compatibility tools that have been prepared, instituted or legislated at the national level and may be available for utilization by the study area jurisdictions.

10 USC, Subtitle A, Part IV, Chapter 159 §2684a

This federal legislation granted authority to the Department of Defense (DOD) to partner with local governments and conservation organizations to assist in acquiring land near military installations from a willing seller when the acquisition can protect both the environment and the military mission. Purchasing development rights would 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 would be strictly voluntary.

Clean Air Act

The US Clean Air Act empowers the Environmental Protection Agency (EPA) and state environmental agencies to regulate pollution. The Clean Air Act provides for the EPA and state regulatory agencies to establish heightened air quality regulations in counties designated by the EPA as nonattainment for air quality. A map of these counties is available at <http://www.epa.gov/oaqps001/greenbk/mapnpoll.html>. The JLUS Study Area does not include any counties designated as nonattainment by the EPA or designated as near nonattainment by the Texas Commission on Environmental Quality. Consequently, operations at Sheppard AFB are unlikely to ever be impacted by Clean Air Act issues related to the Sheppard area.

Clean Water Act (CWA)

The CWA governs the management of water resources and controls and monitors water pollution in the US. The CWA establishes the goals of eliminating the release of toxic substances and other sources of water pollution to ensure that surface waters meet high quality standards. In so doing the CWA prevents the contamination of nearshore, underground and surface water resources.

Endangered Species Act (ESA)

The Endangered Species Act (ESA) establishes a program for the conservation of threatened and endangered plants and animals and their habitats. The US Fish and Wildlife Service (USFWS) and National Oceanic and Atmospheric Administration (NOAA) are the lead implementing agencies of the ESA. The ESA requires federal agencies, in consultation with the USFWS and / or the NOAA Fisheries Service, to ensure that actions they “authorize, fund, or carry out are not likely to jeopardize the continued existence of any listed species or result in the destruction or adverse modification of designated critical habitat of such species.” The law also prohibits any action that causes a taking of any listed species of endangered fish or wildlife. The ESA provides a platform for the protection of critical habitat and species that may be at risk of extinction.

Within the study area, several species have been identified as threatened or endangered. These species are identified and discussed further in the US Fish and Wildlife discussion on the following pages.

Federal Aviation Act (Title 14, Part 77)

The Federal Aviation Act was passed in 1958 to provide methods for overseeing and regulating civilian and military use of airspace over the United States. The Act requires the Secretary of Transportation to make long-range plans that formulate policy for the orderly development and use of navigable air space. The intent is to serve the needs of both civilian aeronautics and national defense, but does not specifically address the unique needs of military agencies. Military planning strives to work alongside local, state, and federal aviation law and policies but sometimes must supersede these and other levels of government due to national security interests. The FAA was created as a result of the Act for a variety of

purposes, including the management of airspace over the US.

The 500-foot rule, promulgated by the FAA, states that every citizen of the United States has “a public right of freedom of transit in air commerce through the navigable air space of the United States”. The rule was formally announced in the 1963 Court of Claims ruling in *Aaron v. United States* and states that flights 500 feet or more above ground level (AGL) do not represent a compensable taking because flights 500 feet AGL enjoy a right of free passage without liability to the owners below.

Another important outcome of the Act is FAA Regulation Title 14, Part 77, commonly known as Part 77, which provides the basis for evaluation of vertical obstruction compatibility. This regulation determines compatibility based on the height of proposed vertical structures or natural features in relation to their distance from the ends of the runway. Using a distance formula from this regulation, local jurisdictions can easily assess the height restrictions near airfields. Additional information on Part 77 is located on the Federal Aviation Administration Internet site at [http:// www.faa.gov/](http://www.faa.gov/).

As of January 29, 2013, the main focus of Part 77.17 is to establish standards used to determine obstructions within navigable airspace, typically within a certain distance from an airport or airfield. It defines an obstruction to air navigation as an object that is of greater height than any of the following heights or surfaces in the following manner:

- A height of 499 feet AGL at the site of the object;
- A height that is 200 feet AGL or above the established airport elevation, whichever is higher, within 3 nautical miles of the established reference point of an airport, excluding heliports with its longest runway more than 3,200 feet in actual length. This height increases in the proportion of 100 feet for each additional nautical mile of distance from the airport up to a maximum of 499 feet;
- A height within a terminal obstacle clearance area, including an initial approach segment, a departure area, and a circling approach area, which would result in the vertical distance between any point on the object and an established minimum instrument flight altitude within that area or segment to be less than the required obstacle clearance;
- A height within an en route obstacle clearance area, including turn and termination areas, of a federal airway or approved off-airway route, that would increase the minimum obstacle clearance altitude; and
- The surface of a takeoff and landing area of a civilian airport or any imaginary surface established under 77.19, DOD: 77.21 and heliports: 77.23. However, no part of the takeoff or landing area itself will be considered an obstruction.

National Environmental Policy Act (NEPA)

The NEPA of 1969 is a federal regulation that established a US national policy promoting the protection and enhancement of the environment and requires federal agencies to analyze and consider the potential environmental impact(s) of their actions. The purpose of NEPA is to promote informed decision-making by federal agencies by making detailed information concerning significant environmental impacts available to both agency leaders and the public.

All projects receiving federal funding require NEPA compliance and documentation. NEPA is applicable to all federal agencies, including the military. Not all federal actions require a full environmental impact statement (EIS). In some cases, if the action may or may not cause a significant impact the agency can prepare an environmental assessment (EA), which is less intensive.

A NEPA document can serve as a valuable planning tool for local planning officials. An EA or EIS can assist in the determination of potential impacts that may result from changing military actions or operations and their effect on municipal policies, plans and programs, and the surrounding community.

NEPA mandates that the military analyze the impact of its actions and operations on the environment, including its surrounding civilian communities. Inherent in this analysis is an exploration of methods to reduce any adverse environmental impact. The EIS is a public process that welcomes participation by the community.

Noise Control Act of 1972

The Noise Control Act of 1972 determined that noise not adequately controlled has the potential of endangering the health and welfare of people. It states that all Americans are entitled to an environment free from noise that can jeopardize their general health and quality of life. Along with state, local, and territorial governments, actions from the federal government were needed to ensure that the objectives of the Act were met.

Concurrently, military installations were experiencing impacts related to encroaching urban development locating adjacent to the installation and the resulting complaints regarding noise from military flight operations. In 1973, the DOD responded by establishing the AICUZ program.

The Noise Control Act, as well as the AICUZ program, is important because encroaching development and increased population near military installations often creates compatibility concerns. As communities grow, it is important that the military installation, developers, and the communities work together to mitigate the issue of noise and develop ways to coexist compatibly.

Department of Defense Conservation Partnering Initiative

In 2003, Congress amended Title 10 U.S.C. §2684a and §2692a (P.L. 107-314), the National Defense Authorization Act, to add authority to the DOD to partner with other federal agencies, states, local governments, and conservation based Non-Governmental Organizations (NGO) to set aside lands near military bases for conservation purposes and to prevent incompatible development from encroaching on, and interfering with, military missions.

This law provides an additional tool to support smart planning, conservation, and environmental stewardship on and off military installations. In response to the authority created by the 2003 National Defense Authorization Act, the purpose of the program is to acquire real property interests, such as conservation easements or development rights to address current and potential encroachment or compatibility threats to an installation's mission.

Department of Defense Readiness and Environmental Protection Initiative (REPI)

To implement the authority provided by the Department of Defense Conservation Partnering Initiative, the DOD established the REPI. This initiative enables DOD to work with state and local governments, non-governmental organizations, and willing landowners to limit encroachment and incompatible land use.

REPI funds are used to support a variety of DOD partnerships that promote compatible land use. By relieving encroachment pressures, the military is able to test and train in a more effective and efficient manner. By preserving the land surrounding military installations, habitats for plant and animal species are conserved and protected.

Department of Defense Energy Siting Clearinghouse

Section 358 of the 2011 National Defense Authorization Act (NDAA) authorized the study of the effects of new construction and obstructions on military installations and operations. The Energy Siting Clearinghouse serves to coordinate the DOD review of existing applications for energy projects. Several key elements of Section 358 include designation of a senior official and lead organization to conduct the review of energy project applications, a specific time frame for completion of a hazard assessment associated with an application (30 days), specific criteria for DOD objections to projects and a requirement to provide an annual status report to Congress. This legislation facilitates procedural certainty and a predictable process that promotes compatibility between energy independence and military capability.

National Pollutant Discharge Elimination System (NPDES)

Pursuant to the CWA, the National Pollutant Discharge Elimination System (NPDES) permit program controls water pollution by regulating point sources that discharge pollutants into US waters. Point sources are discrete conveyances such as pipes or man-made ditches. According to the law, individual homes that are connected to a municipal system, use a septic system, or do not have a surface discharge do not need an NPDES permit; however, industrial, municipal, and other facilities must obtain permits if their discharges go directly to surface waters.

Integrated Natural Resources Management Plan (INRMP)

The policy of the DOD is to fully comply with applicable federal, state, and county laws, ordinances, regulations, and guidelines, specifically designed to protect and preserve the environment. The Sikes Act Improvement Amendments of 1997 requires that the DOD manage their natural resources while providing a sustained method for the multiple uses of those resources. The Act also requires the development of the INRMP document. To guide natural resource management efforts on-installation, SAFB maintains an INRMP completed in 2003, for the 2003-08 period that acknowledges threatened and endangered species, describes habitat conservation, water resources conservation, and includes a data inventory.

Bureau of Land Management (BLM)

The BLM does not administer any plans or programs affecting the study area.

US Fish and Wildlife Service (USFWS)

The Endangered Species Act of 1973, as amended (Act), Section 4(f) directs the Secretary of Commerce and the Secretary of the Interior to develop and implement recovery plans for animal and plant species listed as endangered or threatened, unless such plans would not promote the conservation of the species. Coordination among State, Tribal or Federal agencies, academic institutions, private individuals and organizations, commercial enterprises, and other affected parties is the most essential ingredient for recovering a species.

The following species have been listed as threatened or endangered by the FWS within the study area:

In Wichita County, Texas:

- Whooping crane (*Grus americana*) listed as endangered since 1967; the recovery plan is in the Final Revision stage.
- Least tern (*Sterna antillarum*) listed as endangered; the recovery plan is in the Final stage.

In Tillman County, Oklahoma:

- Whooping crane (*Grus americana*) listed as endangered since 1967; recovery plan is in the Final Revision stage.

- Piping plover (*Charadrius melodus*) listed as threatened; the recovery plan is in the Final stage.
- Least tern (*Sterna antillarum*) listed as endangered; the recovery plan is in the Final stage.
- Black capped Vireo (*Vireo atricapilla*) listed as endangered; the recovery plan is in the Final stage.

No critical habitat has been identified associated with these species.

The Endangered Species Act prohibits the "take" of listed species through direct harm or habitat destruction. In the 1982 ESA amendments, Congress authorized the USFWS (through the Secretary of the Interior) to issue permits for the "incidental take" of endangered and threatened wildlife species (Section 10a(1)(B) of the ESA). Thus, permit holders can proceed with an activity that is legal in all other respects, but may result in the "incidental" taking of a listed species.

There is an array of permits for the removal of an endangered or threatened species, e.g., incidental take permits, enhancement of survival permits, and recovery and interstate commerce permits. Each type of permit has a number of prerequisites.

Incidental take permits are required when non-Federal activities will result in take of threatened or endangered species. A habitat conservation plan or "HCP" must accompany an application for an incidental take permit. The habitat conservation plan associated with the permit ensures that the effects of the authorized incidental take are adequately minimized and mitigated. The 1982 amendment requires that permit applicants design, implement, and secure funding for the HCP that minimizes and mitigates harm to the impacted species during the proposed project. HCPs are legally binding agreements between the Secretary of the Interior and the permit holder.

Enhancement of survival permits are issued to non-Federal landowners participating in Safe Harbor Agreements or Candidate Conservation Agreements with Assurances. These agreements encourage landowners to take actions to benefit species while also providing assurances that they will not be subject

to additional regulatory restrictions as a result of their conservation actions.

Recovery and interstate commerce permits are issued to allow for take as part of activities intended to foster the recovery of listed species. A typical use of a recovery permit is to allow for scientific research on a listed species in order to understand better the species' long-term survival needs. Interstate commerce permits also allow transport and sale of listed species across State lines (e.g., for purposes such as a breeding program).

However, because some species listed are subject to the Migratory Bird Treaty Act, it is illegal for anyone to take, possess, import, export, transport, sell, purchase, barter, or offer for sale, purchase, or barter, any migratory bird, or the parts, nests, or eggs of such a bird except under the terms of a valid permit issued pursuant to Federal regulations. The migratory bird species protected by the Act are listed in 50 CFR 10.13.

As authorized by the Migratory Bird Treaty Act, the US Fish and Wildlife Service issues permits to qualified applicants for the following types of activities: falconry, raptor propagation, scientific collecting, special purposes (rehabilitation, educational, migratory game bird propagation, and salvage), take of depredating birds, taxidermy, and waterfowl sale and disposal. Migratory bird permit policy is developed by the Division of Migratory Bird Management and the permits themselves are issued by the Regional Bird Permit Offices. The regulations governing migratory bird permits can be found in 50 CFR part 13 (General Permit Procedures) and 50 CFR part 21 (Migratory Bird Permits).

The listed species in the study area are subject to federal protection and activities affecting them are strictly regulated.

Recovery Credit System (RCS)

The RCS program was created by the USFWS. An RCS is an optional tool available to Federal agencies to promote and enhance the recovery of listed species on non-Federal lands. Using RCSs, Federal agencies are able to more clearly show how benefits accrued on non-Federal lands offset unavoidable effects of Federal actions elsewhere. However, in an RCS, the combined effects of both adverse and beneficial actions must achieve a net benefit to the recovery of the species.

A recovery credit is a unit of measure established by an RCS that quantifies the contribution that an agency's action makes toward the recovery of a listed species. Credits are based on, and linked with, the implementation of specific conservation measures identified in a species' approved recovery plan. If there is no final approved recovery plan, an RCS may employ an equivalent service-approved document that describes specific measures that will contribute to the downlisting or delisting of endangered or threatened species.

The RCS program is a new program, which has thus far only been implemented at one military facility in central Texas. In this case, the RCS is comprised of leases for a term ranging from 5 to 25 years. Landowners are provided confidentiality and, therefore, no public comment is allowed on the merits of RCS credits for particular tracts. Also, the leases may be organized in terms of repayment schedules and a penalty clause. In a rapidly growing region, temporary leases may not be suitable if the intent is to execute conservation requirements. Traditional conservation easements (which are not revocable and run in perpetuity) may be a more preferable approach.

4.15 Other References

Guides

The Practical Guide to Compatible Civilian Development near Military Installations (July 2007), OEA

This guide offers general information on community development and civilian encroachment issues. The guide can be found at: <http://www.oea.gov/>.

Joint Land Use Study Program Guidance Manual (November 2006)

This manual provides guidance on the JLUS program, process, and efforts to support compatible development. This manual can be obtained on the OEA internet site at the following address: <http://www.oea.gov/>.

Encouraging Compatible Land Use between Local Governments and Military Installations: A Best Practices Guide (April 2007), NACO

This guidebook presents case studies of best practices between the military and communities through communication, regulatory approaches, and Joint Land Use Studies. The guide can be accessed

on the NACO internet site at the following address:
<http://www.naco.org/>.

Guidelines for Sound Insulation of Residences Exposed to Aircraft Operations (April 2005)

This guide was prepared for the Department of the Navy, Naval Facilities Engineering Command to provide communities located near military air installations with information and construction techniques and materials to minimize the impact of aircraft noise on indoor activities. The complete guidelines can be viewed online at the following address:

http://www.fican.org/pdf/Wyle_Sound_Insulation.pdf.

Videos

The Base Next Door: Community Planning and The Joint Land Use Study Program, OEA

This informative video discusses the issue of encroachment near military installations as urban development occurs within its vicinity.

Managing Growth, Communities Respond, OEA

This video highlights the lessons learned from three successful communities (Kitsap Naval Base in Bangor, Washington; Fort Drum in Jefferson County, New York; and Fort Leonard Wood in Pulaski County, Missouri) managing growth near their respective military installation.



CHAPTER 5: COMPATIBILITY ASSESSMENT

CHAPTER 5:
COMPATIBILITY
ASSESSMENT

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Compatibility, in relation to military readiness, is defined as the balance or compromise between community and military needs and interests. The goal of compatibility planning is to promote an environment where both entities communicate, coordinate, and implement mutually supportive actions that allow them to achieve their respective objectives.

Numerous factors influence whether community and military plans, programs, and activities are compatible or in conflict. For the Sheppard Air Force Base (AFB) Joint Land Use Study (JLUS), a total of 23 compatibility factors were reviewed to identify, and establish priorities for, the key study area issues. These compatibility factors are organized into three broad categories: man-made, natural resources, and competition for scarce resources. The issues in this chapter are divided into those affecting the Sheppard AFB Study Area and the Frederick Regional Airport Study Area.

5.1 Methodology and Evaluation	5-3	5.4 Compatibility Tools	5-32
5.2 Sheppard AFB Study Area		Acquisitions	5-32
Compatibility Factors	5-4	Capital Improvements Plan	5-33
Interagency Coordination / Communication	5-4	Communication/Coordination	5-34
Land Use	5-6	Plans and Programs	5-34
Safety	5-8	Habitat Conservation Tools	5-34
Vertical Obstructions.....	5-12	Legislation	5-34
Local Housing Availability	5-15	Memorandum of Understanding (MOU)	5-35
Infrastructure Extensions	5-15	Real Estate Disclosure	5-35
Anti-Terrorism / Force Protection	5-15	Zoning / Building Codes	5-35
Noise.....	5-15	Subdivision Regulations	5-36
Vibration.....	5-20		
Dust / Smoke / Steam.....	5-21		
Light and Glare	5-21		
Energy Development	5-21		
Air Quality	5-22		
Frequency Spectrum Interference	5-22		
Public Trespassing	5-22		
Cultural Resources	5-22		
Legislative Initiatives.....	5-23		
Water Quality / Quantity.....	5-23		
Threatened and Endangered Species.....	5-24		
Scarce Natural Resources.....	5-24		
Land / Air Spaces	5-24		
Frequency Spectrum Capacity	5-25		
Roadway Capacity.....	5-25		
5.3 Frederick Regional Airport Study Area			
Compatibility Factors	5-26		
Interagency Coordination	5-26		
Land Use	5-26		
Safety.....	5-26		
Vertical Obstructions.....	5-28		
Noise.....	5-28		
Dust / Smoke / Steam.....	5-31		
Energy Development	5-31		
Frequency Spectrum Impedance and Interference.....	5-31		
Public Trespassing	5-31		
Scarce Natural Resources.....	5-32		

5.1 Methodology and Evaluation

The purpose of this section is to describe the compatibility factors assessed in the identification of compatibility issues associated with the Sheppard AFB. The JLUS evaluation approach consisted of a comprehensive and inclusive discovery process identifying the key stakeholder issues associated with the common compatibility factors. The analysis of these issues directly or indirectly affected the recommended strategies in the JLUS Report. During the preparation of the JLUS, the Policy Committee (PC), the Technical Committee (TC), and the public assisted in working through all 23 factors to identify, describe, and prioritize the extent of existing and potential future compatibility issues that could impact lands within or near the study area.

At the initial committee workshops and public forums, these groups were asked to identify the location and type of compatibility factors along with specific issues they thought existed today or could occur in the future. Other factors and associated issues were added based on the evaluation of available information and the project consultant’s relevant experience on similar projects.

When reviewing this information, it is important to note the following:

- This section provides a technical background on the factors and issues discussed based on available information. The intent is to provide an adequate context for awareness, education, and development of JLUS recommendations. As such, it is not designed or intended to be utilized as an exhaustive technical evaluation of existing or future conditions within the study area.

Man-Made Factors		Natural Resource Factors
1 Interagency Coordination / Communication	9 Vibration	18 Water Quality / Quantity
2 Land Use	10 Dust / Smoke / Steam	19 Sensitive Biological Resources
3 Safety Zones	11 Light and Glare	Competition for Scarce Resources
4 Vertical Obstructions	12 Energy Development	
5 Local Housing Availability	13 Air Quality	
6 Infrastructure Extensions	14 Frequency Spectrum Impedance / Interference	
7 Anti-Terrorism / Force Protection	15 Public Trespassing	
8 Noise	16 Cultural Sites	20 Scarce Natural Resources
	17 Legislative Initiatives	21 Land, Air, and Sea Spaces
		22 Frequency Spectrum Capacity
		23 Roadway Capacity

5.2 Sheppard AFB Study Area Compatibility Factors

Interagency Coordination / Communication

Interagency coordination relates to the level of interaction on compatibility issues among military installations, jurisdictions, land and resource management agencies, and conservation authorities. It is a foundational compatibility factor that must be recognized to ensure successful balance and / or compromise between community and military needs and interests.

Compatibility Assessment

COM-1: Agency Coordination

It is vital to ensure adequate and timely communication between Sheppard AFB and the agencies and organizations engaged in planning and resource management in the study area. Ensure communication efforts are bi-directional – from Sheppard AFB to agencies and agencies to Sheppard AFB – concerning their activities. The following key areas need enhanced coordination:

- Proposed development projects
- Housing needs and associated living accommodations
- Environmental compliance activities (NEPA, etc.)
- Changes and notifications of operations (including aviation operations and any frequency spectrum operations)
- Land acquisition
- Habitat protection
- Prescribed burns
- Infrastructure project extensions and / or improvements

Military installations are often unaware of when community development projects are proposed or they are consulted late in the process. This becomes a concern if the project could have a direct impact on the military mission. More likely, the cumulative effect of uncoordinated community projects may become a compatibility concern for military operations; this is how encroachment occurs. Similarly, local communities may often not receive adequate notice of proposed military development efforts, which cover the spectrum from major facility construction to minor maintenance and repair. It is often the seemingly innocuous efforts (i.e., installing new bollards at an entrance gate) that could have unintended consequences (backed up traffic in this example) on the local community.

While the National Environmental Policy Act (NEPA) requires notification, this should not be the only method of communications and coordination on proposed projects. Identifying and involving all potential affected jurisdictions, agencies and decision makers in the process early helps minimize the potential for incompatible development around Sheppard AFB. Although the City of Wichita Falls, Wichita County, and the other surrounding communities have established a collaborative relationship with Sheppard AFB, it would be beneficial for all to develop and formalize communication procedures, review and response procedures relative to application review, and so forth.

The issue of agency coordination runs much deeper than just development related concerns. It is vital to have adequate and timely communication between Air Force personnel (Sheppard AFB) and the multitude of agencies and organizations engaged in planning and resource management in the study area. As illustrated by the list in Issue COM-1 (which is by no means exhaustive), coordination must regularly occur to ensure the base is informing the community on all significant events and efforts and the community must reciprocate. In virtually all cases, if vested parties are brought together early in the planning and discussion phases, then the actual execution will go much smoother.

In addition to agencies communicating with each other, they must also communicate internally. Oftentimes, one individual in an agency, or at the base, may have knowledge of what is happening, but may not share it with the appropriate people so that everyone is equally informed. For the flow of

communication to work effectively between entities, it must also work within each of the individual entities.

COM-2: Enhanced Public Disclosure Regarding Changes on Sheppard AFB	<p>Although Sheppard AFB meets notification requirements provided under appropriate regulations, enhanced communications efforts with the public on the following topics would improve overall coordination and cooperation with activity planning, etc.</p> <ul style="list-style-type: none"> ■ Proposed projects ■ Recreational activities ■ Changes in and notifications about operations outside the typical schedule
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During the Sheppard AFB JLUS process, the committees and several members of the public expressed concern that they were not made aware of changes or activities occurring on Sheppard AFB that could impact the community. In addition to concerns over development discussed in COM-1, the public desires enhanced notification of mission changes, prescribed burns, gate closings, and changes in general that occur on base that could affect the local community.

As the areas around Sheppard AFB continue to be developed, impacts generated by training, daily operations, and development on the base will become more influential. Sheppard AFB has a collaborative and active presence in the community due to installation leadership involvement in many forums, but their message is not always received by the general public.

In the absence of public disclosure about changes to base procedures, major events, and development plans, Sheppard AFB will likely receive more questions, concerns, complaints, and meet more resistance from neighbors. Increased community awareness through enhanced notification has the potential to reduce the number of noise, smoke, and air quality complaints associated with scheduled burns and training operations. Similarly, the number of complaints related to traffic pattern changes may decrease and the public will generally have an increased appreciation for changes base leadership must make to continue effective operations. The ultimate goal is to improve compatibility between Sheppard AFB and neighboring communities.

COM-3: Enhanced Regional Cooperation on Common Issues	<p>Communications is challenging due to the multiple number of agencies with overlapping responsibilities in the area, which can create delays and conflicts for addressing issues associated with Sheppard AFB.</p>
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To best manage the resources of the region and coordinate investments in infrastructure and transportation systems, Sheppard AFB, the City of Wichita Falls, Wichita County and the numerous jurisdictions in the area need to enhance regional coordination. There are multiple subject areas such as sensitive species habitat protection, transportation improvements, infrastructure development, and groundwater quality maintenance that require coordination on a regional scale.

As budget pressures continue for federal, state, regional, and local entities, creating synergies in areas of mutual interest will become increasingly relevant. These common interests can range from enhanced bus service for installation personnel to multimillion dollar real estate instruments such as Enhanced Use Leases that facilitate mutually beneficial growth and development. To reduce duplicative services and maximize available funds, base personnel and community leaders need to explore the range of possible services and activities that further the concept of enhanced regional cooperation.

COM-4: Sheppard AFB Membership on the Wichita Falls Metropolitan Planning Organization (MPO)	<p>The City of Wichita Falls has invited a representative from Sheppard AFB to attend the Technical Advisory Committee (TAC) and the Transportation Policy Committee (TPC) as an ex-officio member, but Sheppard AFB does not always have the staff resources to participate.</p>
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The Wichita Falls MPO is a regional transportation planning organization established by the federal government to ensure collaboration on transportation decisions is conducted in a continuous and comprehensive manner. The MPO works with local, state, and federal government entities, the private sector, and local residents to develop and review

annual, short-term, and long-range transportation plans for the MPO area. Through the MPO, coordination of regional transportation needs occurs between the State of Texas, Wichita County, Wichita Falls, Pleasant Valley, and Lakeside City.

Due to its location within the MPO area and the large economic and employment benefit that it provides to the region, Sheppard AFB has been invited to attend the TAC and TPC meetings. The Sheppard AFB representative is intended to serve ex-officio, to relay information between the committees and base leadership. Wichita Falls MPO has invited Sheppard AFB to participate in the past, but limitations on the availability of a regular attendee have impacted attendance. Sheppard AFB recently assigned a civil engineer from the base to sit as an ex-officio member on the TAC; there was no formal MOU involved in this process. A member of Sheppard AFB could still sit as an ex-officio member of the TPC to be integrated into the planning process and information channel.

Land Use

The basis of land use planning relates to the government's role in protecting public health, safety, and welfare. County and local jurisdictions' growth policy / general plans and zoning ordinances can be the most effective tools for avoiding, or resolving, land use compatibility issues. These tools ensure the separation of land uses that differ significantly in character. Land use separation also applies to properties where the use of one property may impact the use of another. For instance, industrial uses are often separated from residential uses to avoid impacts related to noise, odors, lighting, etc.

Compatibility Assessment

LU-1: Visual Appeal of Land Uses Outside Sheppard AFB Gate

The privately owned areas outside the Main Gate and along the boundary of Sheppard AFB are not well maintained and may give an impression of poor maintenance by the base.

During the information gathering portion of the JLUS process, some of the private properties outside the Sheppard Main Gate and adjacent to the boundary of the installation were noted as poorly maintained and without compatible visual appeal relative to the base. Sheppard AFB has erected various types of buffer

fencing and landscaping along some perimeter areas that abut civilian uses to provide more visual appeal or separate the uses. Non-military land uses along the perimeter of the base between the main entry gate and the Missile Road entry gate give a poor first impression because of a lack of maintenance and a mix of transitional uses.

In 2008, a Vision 20/20 Plan was completed for Wichita Falls, which included an Economic Diversification Plan. This plan was developed in response to the 2005 Base Realignment and Closure (BRAC) Commission decision to transfer medical personnel away from Sheppard AFB. One of the strategies developed out of the plan is to support a "Gateway" project near the north gate, which would include services aimed towards Sheppard AFB personnel and students, including housing medical offices, higher education institutions, and retail / restaurant / entertainment venues. One focus of this strategy is to improve the type of development around Sheppard AFB and improve aesthetics, maintenance, and long-term development standards of the areas outside the base. This proposed plan could also integrate better development around the Main Gate.

LU-2: Waivers for Clear Zones Off-Base

There are privately owned properties outside the boundary of Sheppard AFB that lie within the Clear Zones and do not have easements that prohibit development. Privately owned properties in clear zones are currently subject to City of Wichita Falls' airport zoning restrictions.

One of the purposes of the JLUS program is to promote the "ways and means" to achieve compatible land use between military installations and surrounding communities and to address safety issues associated with military operations. One of the major topics examined by this study is the type of land use that is allowed within a Clear Zone (CZ) or Accident Potential Zone (APZ). The Sheppard AFB Air Installation Compatible Use Zone (AICUZ) Study includes a very detailed list of the types of development allowed within the CZs and APZs. Generally, no development should occur within the CZs, unless it is necessary to support aircraft operations.

The majority of the parcels within the CZs associated with the runways at Sheppard AFB are either within the base boundaries, or have easements prohibiting development. Easement agreements were entered into between the Air Force and private property owners for the majority of the lands off-base lying within the CZs. However, there are several parcels within the CZs that do not have easements and could potentially be developed. Development would likely not occur because of the City of Wichita Falls Airport Zoning Regulations, which covers portions of Wichita County land around Sheppard AFB. The issues associated with Clear Zones and Accident Potential Zones are discussed further under Issue SAF-1.

LU-3: Unregulated Lands Around Sheppard AFB	Not all of the surrounding jurisdictions have zoning ordinances or comprehensive plans, which could lead to incompatible development and encroachment in several areas around the base.
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A comprehensive plan may guide development with policies, objectives and actions, but is not sufficient to control land use or prevent incompatible development because it is a policy document and does not establish development standards. Zoning is adopted as law consistent with a comprehensive plan and used to implement the goals of the comprehensive plan. Within the State of Texas, cities and counties have limited statutory authority to regulate land uses and it is difficult to control incompatible land use within a county's jurisdiction or a city's extra-territorial jurisdiction (ETJ). This poses a problem when attempting to prevent incompatible land uses from encroaching in areas that would affect the military mission.

However, the cities of Burkburnett and Wichita Falls have comprehensive plans, zoning, and subdivision regulations, and exercise their ETJ authority. These tools together help control incompatible land uses but some provisions are not current and lack specific policy direction as it relates to compatibility with the military.

Compatibility issues can include buildings located under aircraft flight paths or buildings sited too close to weapon firing ranges. Land on the north and eastern sides of Sheppard AFB remains undeveloped

and placing restrictions on those lands could constitute regulatory taking, subject to legal challenge.

The most effective tool available to communities in proximity to Sheppard AFB is subdivision regulation and the associated expansion of infrastructure. There are four jurisdictions in relatively close proximity to Sheppard AFB within the study area that have statutory authority to regulate subdivisions. These are the cities of Burkburnett, Cashion Community and Wichita Falls and Wichita County. Of these, only the cities of Burkburnett and Wichita Falls exercise this authority.

The City of Burkburnett, located approximately four miles northwest of Sheppard AFB exercises its ETJ for a distance of one mile from its corporate limits. This allows the city to review and approve subdivisions only; the regulation of subdivisions cannot be used to control the use, intensity of development (such as the amount of floor area relative to the size of the lot), density, height and setback of buildings and other zoning-related considerations. Because of Burkburnett's distance from Sheppard AFB and the statutory limitation imposed on ETJs, it has limited ability to control development and land use within close proximity to Sheppard AFB.

The City of Cashion Community, located less than one mile north of Sheppard AFB, does not exercise its ETJ authority. Based on its population and reaching agreement with the City of Wichita Falls (which currently exercises ETJ surrounding Cashion Community), it could regulate the development of subdivisions within one mile of its corporate boundary.

The City of Wichita Falls corporate limits include a portion of Sheppard AFB and extend west and south of the base. As with the City of Burkburnett, this allows the city to review and approve subdivisions only. All other development (outside the corporate limits) is not subject to review and approval by local government. The city's five mile ETJ encompasses all of the land surrounding Sheppard AFB, including east of the base, to the county line, a distance of some 3.5-4 miles, except in those areas occupied by the corporate limits of Cashion Community and the area abutting the City of Burkburnett's ETJ.

Wichita County, the fourth jurisdiction with statutory authority to regulate subdivisions, does not exercise this authority. Current state legislation prevents

counties from regulating land uses (zoning) in unincorporated areas. However, through the City of Wichita Falls Airport Zoning Ordinance, adopted under Chapter 241 of the Texas Local Government Code, airport zoning regulations utilized by Wichita Falls can be applied to Wichita County to regulate certain land uses within airfield operational areas.

Future development of land uses around Sheppard AFB is currently regulated by the City of Wichita Falls pursuant to its airport zoning regulations adopted under Chapter 241 of the Texas Local Government Code, which states that the area of authority is limited to a rectangle bounded by lines located no farther than one and one-half statute miles from the centerline of an instrument or primary runway and lines located no farther than five statute miles from each end of the paved surface of an instrument or primary runway.

It is important to regulate land use near military airfields to minimize damage from potential aircraft accidents and reduce air navigation hazards. To help mitigate potential issues, the Department of Defense (DOD) has CZs and APZs in the vicinity of airfield runways. The APZ is usually divided into APZ I and APZ II. Each zone was developed based on the statistical review of aircraft accidents. Studies show that most mishaps occur on or near the runway, predominately along its extended centerline. These zones act much like zoning in the way uses are restricted within the zone. Fortunately, areas south, east and northeast of Sheppard AFB have not experienced the same level of urbanization as other areas west and north of the base. Currently, compatibility issues have been minimal within these areas as they consist primarily of farmland. However, as development pressures increase, these areas could be converted to urban or suburban uses without adequate land use planning controls to protect vital operational areas. Among other problems that could arise from the development of land around the departure and landing areas is the issue of safety hazards from potential aircraft accidents. These areas could experience development pressure since areas outside Wichita County, to the east and south, are growing communities.

Safety

Safety zones are areas where development should be more restrictive in terms of use and concentrations of people due to the potential higher risks to public safety in these areas. Issues to consider include aircraft accident potential zones, weapons firing range safety zones, and explosive safety zones.

Compatibility Assessment

SAF-1: Clear Zones and Accident Potential Zones Extend Off- Base

The CZs and APZs associated with the runways at Sheppard AFB extend off installation onto privately owned land. Within these areas, the Air Force has no control over the type of development that occurs in the safety zones. There is some incompatible development within the safety zones, with the potential for additional growth. There is concern among residents about aircraft accidents near homes within flight areas.

There are four runways used at Sheppard AFB, identified as follows:

- 15Left / 33Right (15L/33R) – measuring 6,000 feet long by 150 feet wide;
- 15Center / 33Center (15C/33C) – measuring 10,003 feet long by 150 feet wide;
- 15Right / 33Left (15R/33L) – measuring 13,101 feet long by 300 feet wide; and
- 17/35 – measuring 7,021 feet long by 150 feet wide.

Runways 15L/33R, 15C/33C, and 15R/33L are all parallel to each other. Each of these runways is a Class B instrument flight rules (IFR) runway. Due to its size, runway 17/35 is a Class A (non-precision) IFR runway. These designations mean that the runways have differently sized aircraft safety zones.

- For a Class B IFR runway, the CZ extends outward from the ends of the runway for 3,000 feet and has a width of 3,000 feet, centered at the runway centerline. The associated APZs also measure a width of 3,000 feet. APZ I starts at the end of the CZ and extends 5,000 feet in length. From the end of this, APZ II extends 7,000 feet in length.
- For a Class A IFR runway, the CZ extends 3,000 feet in length from the end of the runway, with a width of 1,000 feet. The APZs also have a width of 1,000 feet. APZ I extends 2,500 feet from the end of the CZ and APZ II extends 2,500 feet past the end of APZ I.

The 2011 AICUZ study for Sheppard AFB provides a breakdown of the general land use categories that currently exist within the safety zones, and the zoning of land within the safety zones. Within APZ I and APZ II, there are 173 acres of land currently used for residential uses of greater density than one dwelling unit per acre. In terms of zoning, there is no land within any of the CZs or APZs I zoned for residential; however, there are 20 acres of residentially zoned land and seven acres of industrially zoned land within the APZs II. Table 5-1 shows the generalized current land use for lands near Sheppard AFB within the CZs and APZs.

Table 5-1. Generalized Existing Land Uses Within Sheppard AFB CZs and APZs Off-Base

Category	Acreage
Residential	173
Commercial	0
Industrial	20
Public / Quasi-Public	1
Open / Recreation / Agricultural / Low Density Residential	3,401
TOTAL	3,595

Source: 2011 Sheppard AFB AICUZ

The AICUZ study provides a general overview of each land use category shown in Table 5-1, described as follows:

- **Residential:** Residential dwellings, such as single-family and multi-family residences and mobile homes, developed at a density greater than one dwelling unit per acre.

- **Commercial:** Offices, retail stores, restaurants, and other commercial establishments.
- **Industrial:** Manufacturing, warehousing, and other similar uses.
- **Public/Quasi-Public:** 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.
- **Open / Agricultural / Recreational / Low Density Residential:** Undeveloped land, farms, pasture land, residential development with a density of one dwelling unit per acre or less, and outdoor recreational/park uses.

For the purposes of analysis of incompatible land use for zoning categories, the CZs and APZs of each of the three parallel runways (15L / 33R, 15C / 33C, and 15R / 33L) were combined into single units at each end of the runways. Almost all of the combined CZs are located within the boundaries of Sheppard AFB. There are no current land use incompatibilities for the small portions of CZs outside of Sheppard AFB.

Within the combined APZ I area, there are existing incompatible uses. Parts of Cashion Community are located within the APZ I to the north of Sheppard AFB. There are several single-family residential units on Carriage Lane considered incompatible within APZ I. To the south, the Northwest Texas Skeet / Gun Club and a single-family residential unit are incompatible uses located on Old Friberg Road.

Within the northern APZ II area, there are residential units in Cashion Community, but due to their current lot size, they are compatible. If these areas are built up with greater density in the future, they may become incompatible with APZ II. There is incompatible development within the southern APZ II area, including the Pecanway Baptist Church on Pecanway Drive and single-family residential units at a greater density than recommended within APZ II. There is other residential development within the southern APZ II, but at a density compatible with this zone.

The only portion of land currently zoned within the APZs II is in the southernmost APZ II over part of Wichita Falls. This land is zoned Residential Mixed Use, which is generally incompatible with APZ II. The only compatible development allowed in this zone is agricultural, limited recreation, and single family residential at one-to-two units per acre. However, this zoning district allows for greater density and intensity.

For runway 17/35, the CZ and APZs on the northern end of the runway are all located within Sheppard AFB and do not pose any incompatibilities. The southern CZ is located mostly within Sheppard AFB, and the portion that extends off-base does not currently have any development in it. There is also no current development within the southern APZs. These are key areas to protect from future development to mitigate potential incompatibilities. The portion of the southern APZ II that is over Wichita Falls is zoned Light Industrial. While this zone does allow for some uses that could be incompatible within an APZ II, they are required to go through either site plan review, or conditional use review, and is unlikely to be approved within APZ II.

Over the years, there have been a few aircraft crashes near or at Sheppard AFB or at the base itself. Most recently, on the morning of July 19, 2013, a T-38C crashed to the south of Sheppard AFB, in a wooded area south of Pecanway Drive (just outside the Accident Potential Zone). Luckily there was no development in the area where the aircraft crashed, but this underscores the importance of minimizing development in and near identified aircraft safety zones. Both pilots safely ejected, and no one on the ground was injured, but the aircraft was destroyed.

Figure 5-1 identifies the incompatible areas within the safety zones, and existing zoning in the safety zones.

**SAF-2:
Bird
Aircraft
Strike
Hazard
(BASH)
Concerns**

There have been numerous recorded bird and aircraft strikes in and around the vicinity of Sheppard AFB over the years, some of which have caused major damage to aircraft.

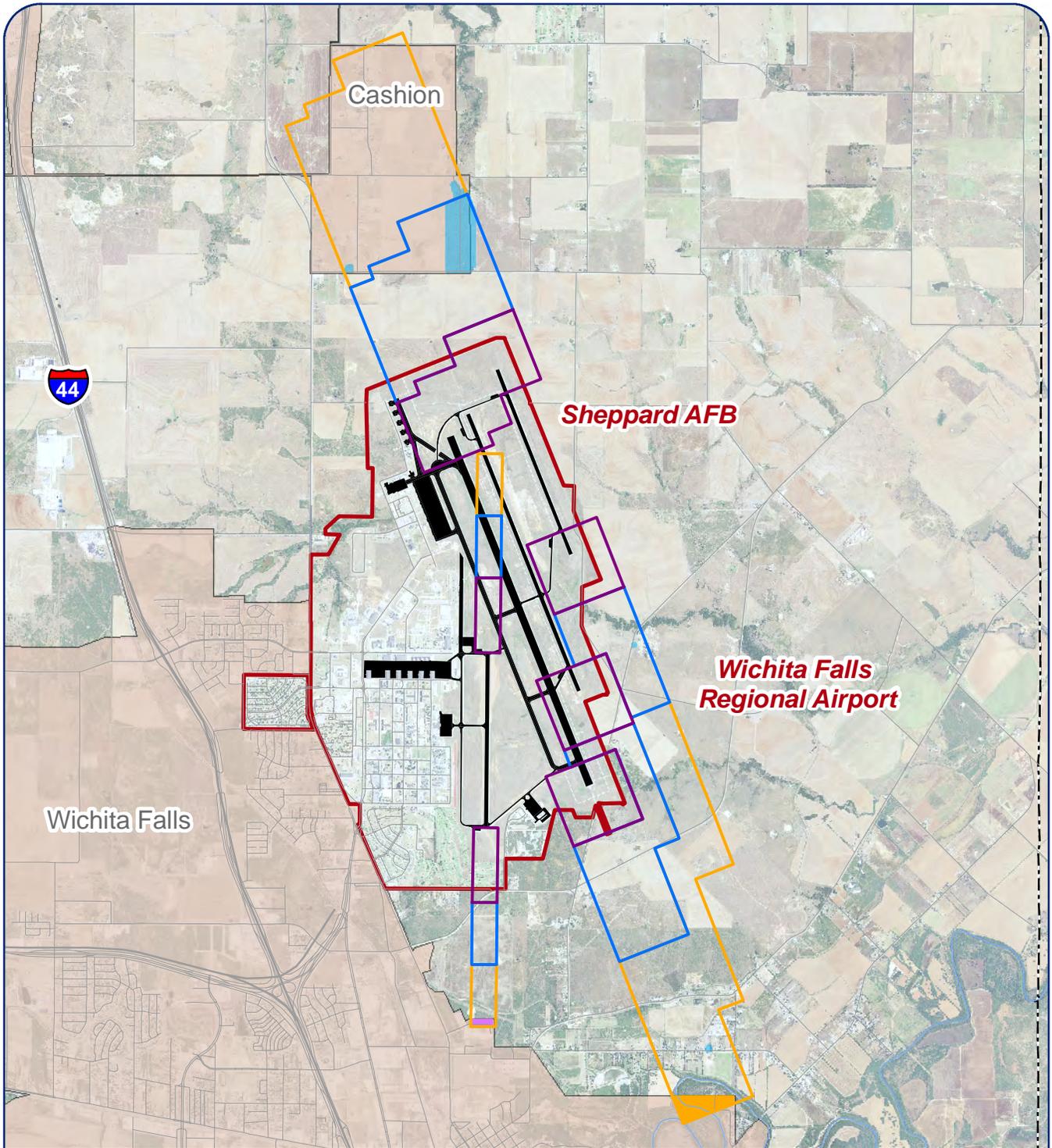
Collisions with birds on the ground or in the air and with wildlife on the ground are dangerous for pilots, people on the ground, and aircraft operations in general. The primary concern at Sheppard AFB is

bird activity, more so than ground-based wildlife, interfering with air operations. A number of variables factor into determining whether a specific land use will create BASH issues. Therefore, the location in relation to air operations and the unique development aspects of each land use must be assessed on a case-by-case basis. It is important to note that the BASH issue may be directly related to a component of the primary property use (i.e., landfills, water features, or stormwater retention ponds in a residential development) or to amenities associated with a land use (i.e., water hazards on a golf course).

There are some land uses that have a higher probability to attract hazardous birds. These uses include, but are not limited to, agriculture, conservation lands, landfills, lakes and ponds, open space, public / semi-public, rural residential, and vacant / undeveloped. Within approach and departure flight tracks and in close proximity to Sheppard AFB, bird attractants exist that could impact aircraft operations at the airfield. These attractants include wetlands, agricultural land uses, and areas that accumulate standing water during and after periods of rain. Standing water, temporary or permanent, can be a serious hazardous bird attractant.

Bird strikes at Sheppard have caused costly damage to some aircraft. In 1985, a collision between a T-38 and multiple brown-headed cowbirds caused dual engine failure and the pilots had to eject. The plane crashed into a nearby field. More recently, an investigation into the aircraft crash that occurred on July 19, 2013 involving a T-38C concluded that the crash was a result of a bird strike that damaged the engine and lead to the aircraft stalling. The aircraft crashed into an undeveloped area and both pilots ejected with minimal injuries. While no major damage was caused to civilian property, the loss of the aircraft was approximately \$8 million.

Other collisions in recent years have caused damage in the hundreds of thousands of dollars per incident. Between October 2009 and June 2013, there have been recorded damages of more than \$2.34 million to aircraft resulting from bird strikes. Figure 5-2 shows the number of documented bird / aircraft strikes involving aircraft at Sheppard AFB from 2003 to 2013. In the figure, the "Total" column represents the total number of bird strikes for that year in all areas, whereas the "Airfield" column represents strikes that occurred over the airfield itself.



Legend

- | | | | | |
|--|-------------------------------|---------------------------|---------------------------|-------|
| Incompatible Lands Under Runway Safety Zones | Runway Safety Zone Clear Zone | Airfield Surface / Runway | Community Covered by JLUS | River |
| Potentially Incompatible Zoning Under Runway Safety Zones Light Industrial | APZ I | Sheppard AFB | Highway | |
| Residential Mixed Use | APZ II | County | Road | |



0 1 2 Miles

Sources: City of Wichita Falls, 2012; TNRS, 2012; Sheppard AFB, 2012.

Figure 5-1
Incompatible Lands Under Runway Safety Zones

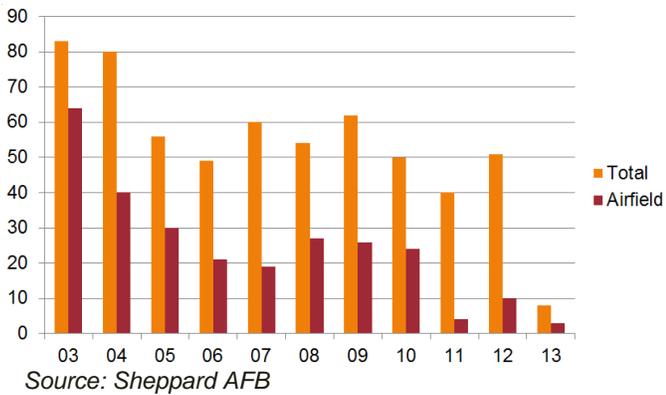


Figure 5-2. Bird / Aircraft Strikes Involving Sheppard AFB Aircraft, 2003-2013

Sheppard AFB maintains a BASH plan, which was most recently published in January 2012. The plan provides on-base mitigation measures to reduce the likelihood of bird strikes. It also includes measures for pilots including awareness of bird activity on flight routes to avoid bird concentrations to the best of their ability.

Many accomplishments have been made by the Sheppard AFB BASH Team to reduce wildlife hazards, including the following:

- Staffed a full-time USDA Wildlife Biologist to mitigate BASH since 2004;
- Enclosed open drainage ditches to reduce bird habitat near the airfield;
- Established a robust wildlife BASH dispersal, removal, and habitat alteration program on base, as well as within Wichita Falls;
- Installed Anti-Perch devices on airfield structures;
- Seasonal alteration of airfield mowing heights to discourage ground nesting / feeding birds;
- Ensured BASH compatible grasses were seeded following airfield construction projects and after extensive loss of vegetation due to drought; and
- Identified and planned control of vegetation incompatible with the BASH Program.

Vertical Obstructions

Vertical obstructions are created by buildings, trees, structures, or other features that may encroach into the navigable airspace used for military operations. These can present a safety hazard to both the public and military personnel and potentially impact military readiness.

Compatibility Assessment

VO-1:

The Airfield is at a Lower Elevation than the Surrounding Topography

Several communities are under the imaginary surfaces associated with Sheppard AFB's runways. The airfield is at a lower elevation than the surrounding topography, which could create development concerns within the imaginary surfaces.

The airfield at Sheppard AFB sits at a lower elevation than the surrounding topography. The elevations (measured at the centerline of the ends of the runways) of Sheppard AFB's four runways range from 989 feet above mean sea level (MSL) to 1,021 MSL.

The imaginary surfaces associated with the various runways at Sheppard AFB are based on the elevation of the runway, and not that of the surrounding topography. Therefore, any development or structures (man-made or natural) that are located or proposed within these imaginary surfaces should consider heights based on the difference in elevation from the airfield. Since the surrounding land areas are at a higher elevation than the runway, depending on the elevation at a specific location, the maximum height of a structure allowed within that imaginary surface may be lower than if it was at the same elevation as the runway because it would still have to be lower than the ceiling of that surface. For example, if a height of 50 feet is allowed in the imaginary surface (assuming the location was on a flat plane at the same height as the runway) at a specific location, but the location is 30 feet higher than the runway (instead of on the same flat plane), then the maximum height would be 20 feet. The potential impact of a vertical obstruction requires a case-by-case review to determine maximum allowed height to fit within the imaginary surface.

To reduce vertical obstructions or hazards for pilots, the following should not occur within imaginary surfaces:

- Any structure (man-made or natural) that is taller than the height of the imaginary surface;
- A use that releases any substance into the air that could impair visibility of a pilot or otherwise interfere with the operation of an aircraft;
- Light emissions that could interfere with pilot visibility; or
- Uses that would attract birds or waterfowl.

The general height limits within Wichita Falls are 35 to 45 feet. However, some zoning districts do not have a height limit: General Commercial, Light Industrial, Heavy Industrial, and Central Business Districts. However, these zones are subject to height limitations pursuant to the Airport Zoning Regulations. In addition, any structure proposed for over 199 feet in height must be reviewed by the FAA for evaluation and recommendations.

Similar to Wichita Falls, the majority of the zoning districts in Burkburnett allow for a maximum height of between 35 to 45 feet. The Commercial / Business District allows for a height of eight stories if the property is not within 300 feet of a residentially-zoned property. At the distance from Sheppard AFB's runways, this height is not tall enough to cause a vertical obstruction.

The City of Wichita Falls developed airport zoning regulations that include the heights allowable for structures within the imaginary surfaces. These regulations include heights allowable at MSL and take into account the elevations of the runways.

Burkburnett has a zoning ordinance that regulates height within each zone, so they can determine compatible use. Wichita Falls has airport zoning regulations that do not allow for heights to exceed those allowed within imaginary surfaces. Through Texas Local Government Code Chapter 241, Wichita Falls can extend its zoning regulations outside its municipal boundaries. Therefore, the Airport Zoning Regulations relative to the imaginary surfaces also cover unincorporated portions of Wichita County where imaginary surfaces are located.

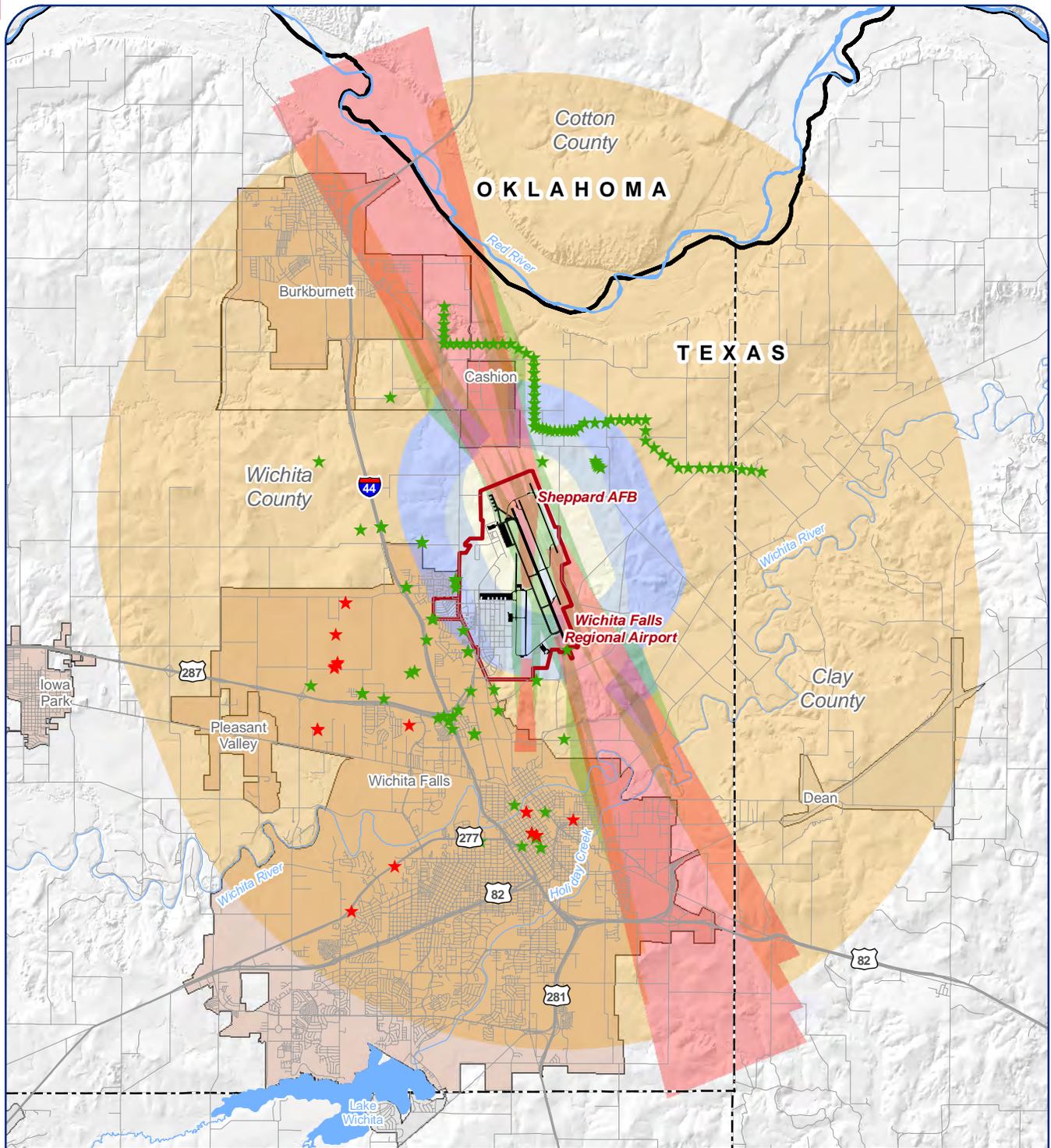
Although these regulations are currently in effect, there is some concern that developers may not be aware of the regulations, particularly those outside the city limits. They may propose plans for a structure or use, such as a communications tower, that would infringe upon one or more imaginary surfaces. Such a

proposal would most likely be detected during review by City staff, but it would also be important to ensure the City staff are properly trained in how to determine when a structure is a vertical obstruction.

The FAA utilizes an Obstruction Evaluation / Airport Airspace Analysis program to determine vertical obstructions around airports. This data indicated that there are several existing vertical obstructions within a five-mile radius of Sheppard AFB, as shown on Figure 5-3. This figure shows both objects that are taller than 200 feet (indicated by red stars) and objects that, when added to the change in elevation between their location considered and the elevation of the airfield, are also an obstruction based on height recommendations around the airfield (indicated by green stars).

<p>VO-2: Desire to Erect Personal Wind Towers on Private Property</p>	<p>Private landowners surrounding Sheppard AFB have expressed interest in erecting personal wind towers to provide sustainable energy for their homes or land. Depending on the locations and sizes of these towers, they could create vertical obstructions for aircraft at Sheppard AFB.</p>
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The zoning ordinance for the City of Wichita Falls allows for the development of wind energy systems. Before a wind energy system can be built, the land owner or builder must obtain a conditional use permit and the location of the wind energy system must meet specific criteria so as to not encroach upon other lands or cause safety issues. The zoning ordinance allows for wind energy systems to exceed the height requirement of the zoning district in which they are located. The ordinance also states that any wind energy system height is subject to FAA regulations and restrictions, and that no system shall be constructed, altered, or maintained so that it projects above any imaginary surfaces of an airfield, or as restricted by the latest Sheppard AFB AICUZ and city Airport Zoning Regulations.



Legend

- | | | | | |
|--|------------------------------|--------------------------------------|---------------------------|------------|
| ★ Vertical Obstruction > 200 feet tall | Airspace Surface Code | Outer Horizontal Surface | State | Highway |
| ★ Vertical Obstruction < 200 feet tall | Primary Surface | Approach-Departure Clearance Surface | County | Road |
| | Transitional Surface | Airfield Surface / Runway | Community Covered by JLUS | River |
| | Inner Horizontal Surface | Sheppard AFB | Other Community | Water Body |
| | Conical Surface | | | |



Sources: City of Wichita Falls, 2012; TNRS, 2012; OCGI, 2012, Sheppard AFB, 2012.

Figure 5-3
Existing Identified Vertical Obstructions Around Sheppard AFB

The City of Burkburnett has zoning regulations, but does not specify if wind towers are allowed in any districts. The districts where they would most likely be permitted are Agriculture, which allows a maximum height of 45 feet for agricultural structures, and Industrial, which allows for a maximum height of 60 feet for unoccupied structures.

Neither Cashion Community nor Pleasant Valley, which are also both within the imaginary surface areas, have zoning or height regulations to allow wind towers or regulate heights if they were permissible.

Personal wind towers in general would be an allowable use to erect on private property provided they are not higher than the heights allowed within the certain imaginary surfaces or safety zones associated with airport runways.

Local Housing Availability

Local housing availability addresses the supply and demand for housing in the region, the competition for housing that may result from changes in the number of military personnel, and the supply of military family housing provided by the installation.

Compatibility Assessment

There were no current or projected future compatibility issues identified with local housing availability in the JLUS study area

Infrastructure Extensions

This factor addresses the extension or provision of infrastructure (roads, sewer, water, etc.). Infrastructure can enhance the operations of an installation by providing needed services, such as sanitary sewer treatment capacity and transportation systems. However, infrastructure can also be an encroachment issue. If enhanced or expanded, infrastructure could encourage growth into areas near the installation that might not be compatible with current or future missions.

Compatibility Assessment

There were no current or projected future compatibility issues identified with infrastructure extensions in the JLUS study area.

Anti-Terrorism / Force Protection

Anti-Terrorism / Force Protection (AT / FP) relates to the safety of personnel, facilities, and information on an installation from outside threats. Methods to protect the installation and its supportive facilities can impact off-installation uses.

Compatibility Assessment

ATFP-1: Apartment Building Adjacent to Main Gate

There is an apartment and hotel adjacent to Sheppard AFB's main gate located within feet of the fence line. This building could be used to gain unlawful access to Sheppard AFB.

There is a two-story apartment and a two-story motel (Econo Inn) located adjacent to the west side of Sheppard AFB's main gate. Both buildings are taller than the fence that separates them from Sheppard AFB property and they are located close enough to the fence that a person could exit a second-story window and access Sheppard AFB property. These structures are in conflict with Air Force AT / FP and standoff requirements. The guardhouse to Sheppard AFB is located further north than where Econo Inn ends, so a person trying to gain access would not be visible to anyone in the guardhouse. While security personnel are aware of the apartment building's location, they do not generally view this as a terrorism concern.

Noise

From a technical perspective, sound is the mechanical energy transmitted by pressure waves in a compressible medium such as air. More simply stated, sound is what we hear. As sounds reach unwanted levels, this is referred to as noise.

The central issue of noise is the impact, or perceived impact, on people, animals (wild and domestic), and general land use compatibility. Exposure to high noise levels can have a significant impact on human activity, health, and safety.

Compatibility Assessment

NOI-1: Noise Footprint Reduction

The current City of Wichita Falls Airport Zoning Regulations state that the Airport Noise Zone boundaries are based on the latest AICUZ study for Sheppard AFB.

The AICUZ for Sheppard AFB was updated in 2011 to reflect the replacement of the T-37 aircraft with the T-6 aircraft. This change in aircraft greatly reduced Sheppard AFB's noise footprint on surrounding communities. In addition, upgraded NOISEMAP software versions have improved the accuracy in calculating noise contours, which helped produce smaller noise contours. As a result of the AICUZ update, the noise contours ranging from 65-69 dB to 80+ dB saw a decrease in total off-base acres from 10,353 to 3,988, a drop of 61 percent of the total land included in the previous AICUZ. Figure 5-4 illustrates the change in noise contours from the 1999 AICUZ to the 2011 AICUZ.

The noise contours within an AICUZ study are based on the activity and aircraft used at the installation during that given time. If the amount of flight activity or the types and / or number of aircraft change, then noise contours are also likely to change as well.

It is suggested that if a noise exposure map changes by DNL 2 dB or more in noise sensitive areas, then the current AICUZ study should be evaluated for an update. Such a change is not likely to occur unless there is a change in missions.

The Wichita Falls Airport Zoning Regulations state that the boundaries of the noise zones established through the regulations are based on the noise contours of the latest AICUZ study for Sheppard AFB. Since these noise contours generally change when the AICUZ is updated, the city's noise zones will also change. This change in regulation boundaries can affect lands that were previously not subject to noise regulations if the noise contours expand, or can release lands from regulations if the contours shrink as they did in the 2011 AICUZ. This could put a burden on the land owners or residents within the previous or new noise zones who had to utilize noise level reduction design or construction techniques.

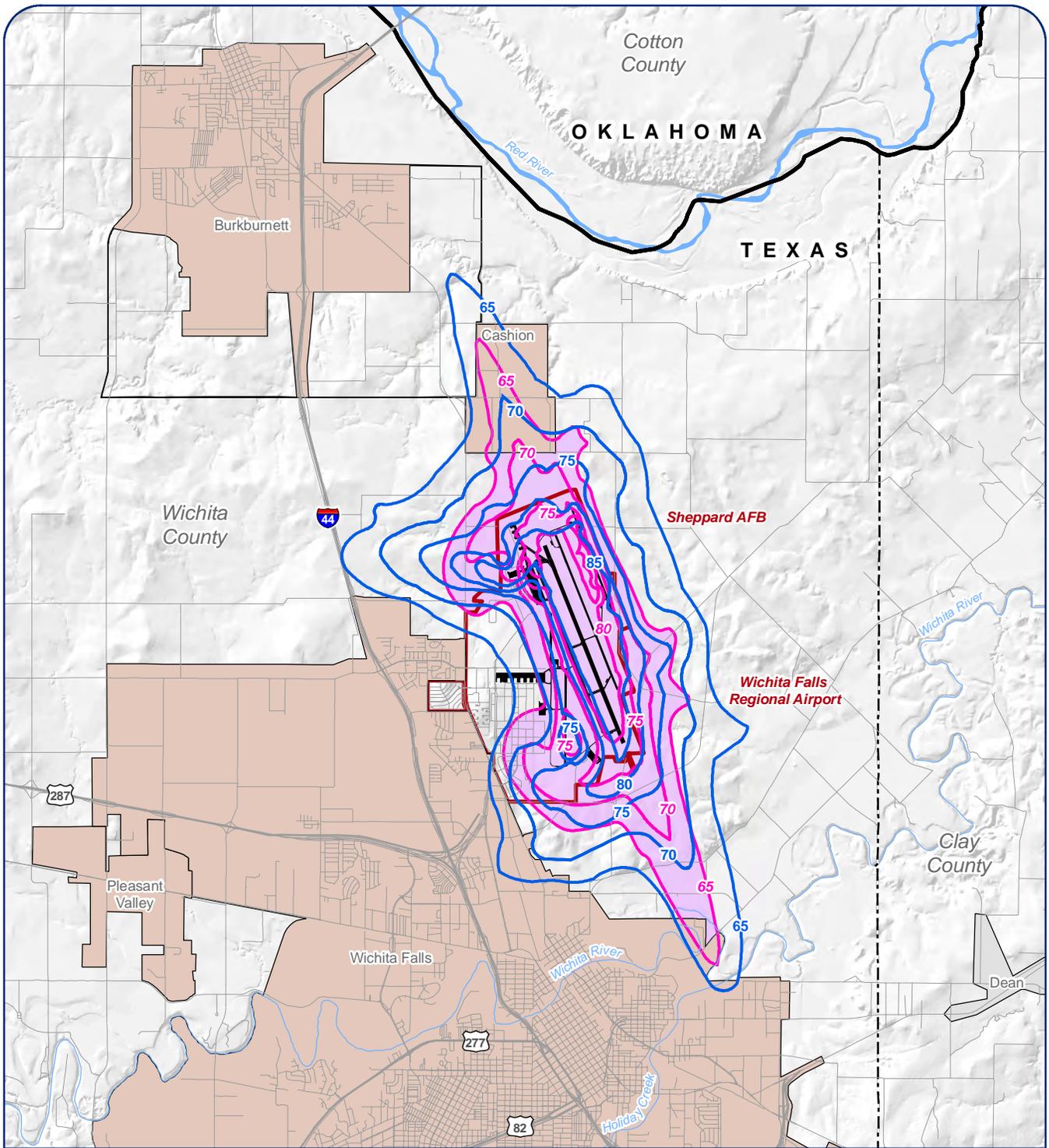
NOI-2: Noise from Aircraft Operations

Noise from aircraft operations is heard outside Sheppard AFB resulting from aircraft overflight of privately owned lands.

One of the concerns that nearby residents have with operations at Sheppard AFB relates to the noise caused by aircraft operations. The 80th Flying Training Wing (80 FTW) at Sheppard AFB has a total of 201 aircraft and flight activity 240 days per year, conducting more than 64,000 hours of flight time annually. Transient military and commercial aircraft operating out of Wichita Falls Regional Airport operate 365 days a year. This abundance of aircraft operations produces noise contours that extend outside of Sheppard AFB.

There are specific flight patterns that aircraft operating out of Sheppard AFB follow. These flight patterns have been developed and modified over the years for several reasons. The primary factor is avoidance of noise sensitive areas whenever possible and the control and scheduling of missions to minimize noise levels, particularly during night flying. Additionally, aircraft pilots and students are instructed not to fly over congested areas at an altitude less than 1,000 feet above the highest obstacle within 2,000 feet of the aircraft, or at an altitude of less than 500 feet AGL over non-congested areas.

The noise contours for aircraft operations at Sheppard AFB were developed in five dB increments, ranging from an 80+ dB contour to a 65-69 dB contour, as shown on Figure 5-5. The 2011 AICUZ study calculated the total number of acres within each noise zone outside the boundaries of Sheppard AFB, and the population residing under each noise contour. The population data used for this purpose is based on the 2000 Census, as 2010 Census data was not available at the time the AICUZ study was prepared. Table 5-2 shows the acreage and population within each noise contour.



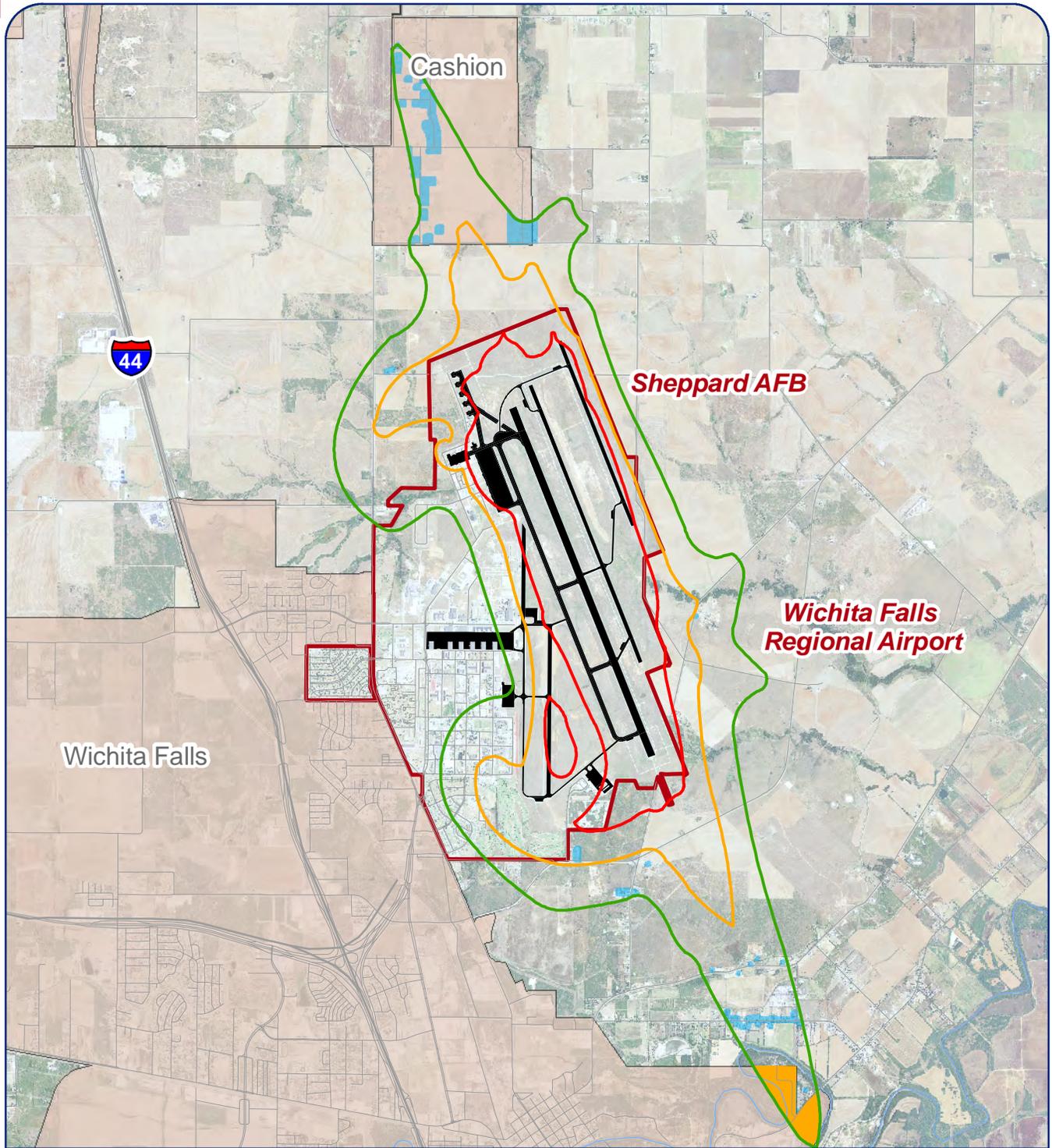
Legend

- AICUZ Noise Contour (1999)
- AICUZ Noise Contour (2011)
- Airfield Surface / Runway
- Sheppard AFB
- State
- County
- Community Covered by JLUS
- Other Community
- Highway
- Road
- ~ River
- Water Body



Sources: City of Wichita Falls, 2012; TNRS, 2012; OCGI, 2012; Sheppard AFB, 2012.

Figure 5-4
Change in AICUZ Noise Zones from 1999 to 2011



Legend

- | | | | | |
|--|----------------------------------|---------------------------|---------|-------|
| Potentially Incompatible Lands Under Noise Zones | AICUZ Noise Contour (2011) 65 dB | Airfield Surface / Runway | Highway | River |
| Zoning | 70 dB | Sheppard AFB | Road | |
| Residential Mixed Use | 75 dB | Community Covered by JLUS | | |



0 1 2 Miles

Sources: City of Wichita Falls, 2012; TNRS, 2012; Sheppard AFB, 2012.

Figure 5-5
Properties with Potentially Incompatible Structures Under Noise Zones

Table 5-2. Off-Base Acres and Population Within the Noise Contours of Sheppard AFB

DNL Noise Contour	Acres	Population
65-69 dB	2,866	258
70-74 dB	976	5
75-79 dB	146	0
80+ dB	0	0
TOTAL	3,988	263

Source: 2011 Sheppard AFB AICUZ Study

The 2011 AICUZ study provides a breakdown of the general land use categories that currently exist and the zoning within the noise contours. Since the AICUZ only provides generalized land use, the actual development within the noise contours may not be incompatible based on construction techniques or other factors. There is less than five acres of residential land at a greater density of one dwelling unit per acre within the noise contours of 65 dB or greater. There are 70 acres of land zoned residential within the 65-69 dB noise contour. However, this zoned area is entirely floodplain and floodway, and unlikely to be developed further in the foreseeable future. Many of the residential properties developed on tracts smaller than one acre are derelict, abandoned, and unlikely to be occupied again. Table 5-3 shows the generalized current land use for lands off-base and within the noise contours for Sheppard AFB, respectively.

Table 5-3. Generalized Existing Land Use Within the Sheppard AFB Noise Contours Off-Base

Category	Acreage
Residential	93
Commercial	0
Industrial	58
Public / Quasi-Public	1
Open / Recreation / Agricultural / Low Density Residential	3,836
TOTAL	3,988

Source: 2011 Sheppard AFB AICUZ Study

The AICUZ study provides a general overview of each of the land use categories shown in Table 5-3, described as follows:

- **Residential:** Residential dwellings, such as single-family and multi-family residences and mobile homes, developed at a density greater than one dwelling unit per acre.
 - **Commercial:** Offices, retail stores, restaurants, and other commercial establishments.
 - **Industrial:** Manufacturing, warehousing, and other similar uses.
 - **Public/Quasi-Public:** 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.
 - **Open/Agricultural/Recreational/Low Density Residential:** Undeveloped land, farms, pasture land, residential development with a density of one dwelling unit per acre or less, and outdoor recreational/park uses.
- According to the Sheppard AFB AICUZ study, the only existing land uses potentially incompatible within the noise contours for Sheppard AFB are within the DNL 65-69 dB noise contour. Single-family residential units are located in the DNL 65-69 dB noise contour to the north of Sheppard AFB in Cashion Community, and to the south of the base in unincorporated Wichita County and in Wichita Falls. These residential areas are compatible if developed at densities less than one dwelling unit per acre and contain appropriate noise level reduction design or construction techniques.
- A church is located in the southern portion of the DNL 65-69 dB noise contour, which could be compatible if the appropriate level of noise level reduction (NLR) standards were used in its construction. Although residential development is not recommended within the DNL 65-69 dB noise contour, it could be conditionally compatible if the appropriate amount of NLR is incorporated into the design and construction.

- The only portion of the noise contours over land with zoning is in the southern tip of the 65-69 dB noise contour, over a small portion of Wichita Falls. This area is zoned Residential Mixed Use. The types of land use allowed under this zoning category, while generally not recommended for this level of noise, could be compatible if they were developed with a NLR of at least DNL 25 dB. As previously noted, this zoned area is floodplain or floodway and is unlikely to be developed in the future.

Figure 5-5 illustrates the existing land uses that contain structures that are potentially incompatible within the noise contours. Figure 5-5 also shows zoning under the noise contours.

The Sheppard AFB Public Affairs Office has a formal noise complaint system and form that can be filled out if residents or other individuals wish to submit an incidence of noise disturbance. The form records the time, date, and location of the incident, and has a section for comments from the caller. Once a complaint is recorded by Public Affairs, the form is then transferred to the appropriate staff at Sheppard AFB to investigate or address. Once a resolution is reached, the responding staff will follow up with the caller through a letter or a phone call to explain the situation and address their concern. This process only occurs with formal complaints. Sometimes when a citizen has a concern about a noise incident, they do not know who to contact or how to voice their concern, or they may feel that it is not worth filing a complaint. Therefore, the number of complaints received by Public Affairs may not be an accurate account of all resident complaints. Between 2008 and 2012, there were a total of 19 formal complaints received by the Public Affairs Office, the majority of which were outside of the JLUS Study Area. This number is minimal relative to the number of aircraft operations that take place in the region, indicating that currently, noise is not a major concern for the study area.

Vibration

Vibration is an oscillation or motion that alternates in opposite directions and may occur as a result of an impact, explosion, noise, mechanical operation, or other change in the environment. Vibration may be caused by military and / or civilian activities.

Compatibility Assessment

VIB-1: Vibrations Caused by Flight Activities

Some aircraft operations over privately owned land have been reported to cause vibration of structures and concern from residents.

It is not uncommon to experience vibration caused by military operations near active installations. These impacts can be substantial or minor nuisances resulting from aircraft operations, firing ranges, and explosions associated with ordnance disposal activities. Based on public comment collected during the Sheppard AFB JLUS process, some aircraft operations over privately owned land have been reported to cause vibration of structures and are of concern to residents.

Vibrations are common with jet aircraft operations (T-38C) and are magnified when close to low-level military training routes and arrival and departure tracks (see Chapter 3). Homes and businesses within high decibel noise (especially peak noise) contours are more likely to experience vibrations due to aircraft operations. If these structures lack proper sound attenuation or insulation or are constructed in a pre-fabricated manner, such as relocatables (trailers), modular units, and steel-shelled buildings, then vibrations will be pronounced inside the structure. Also contributing to the perception of vibration is the sheer number of aircraft operations; Sheppard AFB flew nearly 54,000 sorties in 2012.

Though the specific locations of vibration incidents were not identified, deductive reasoning suggests (based on flight tracks, noise contours, and type of construction) that some homes and businesses to the north of the base (Cashion Community) may be impacted by vibration due to aircraft operations. This is not to suggest that it does not occur elsewhere in the study area, but incidents are more likely to occur at the convergence of contributing conditions.

Studies have been conducted on the potential for structural damage resulting from vibration. When sound that causes vibration exceeds 120 dBP (unweighted peak noise) is when homeowners typically become concerned about structural damage due to the rattling effect. However, structural damage is not likely to occur until a level of 150 dBP is achieved (a level far greater than any private holdings around Sheppard AFB).

Dust / Smoke / Steam

Dust results from the suspension of particulate matter in the air. Dust (and smoke) can be created by fire (controlled burns, agricultural burning, and artillery exercises), ground disturbance (agricultural activities, military operations, grading), industrial activities, or other similar processes. Dust, smoke, and steam are compatibility issues if sufficient in quantity to impact flight operations (such as reduced visibility or cause equipment damage) or the surround community (from prescribed burns or fire training activities).

Compatibility Assessment

DSS-1: Smoke from Sheppard AFB Activities	Fires that occur on Sheppard AFB either from prescribed burns or fire training have the potential to impact off-base uses such as recreation and agriculture.
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Fires that occur on Sheppard AFB have the potential to impact recreation and agricultural activities on land surrounding the installation. The two main sources of smoke are prescribed burns and fire-training operations. Prescribed (or controlled) burns are often used to maintain vegetation growth and limit the spread of invasive species. Depending on environmental conditions (which include wind speed and direction, humidity, moisture content of the fuel source, etc.), the size of the area to be burned, and the amount of burn material, smoke from a prescribed burn can travel a substantial distance from the burn location. Fire training operations are limited to specific locations (burn pit, fire training facility, etc.) and under much stricter controls. These operations can also generate smoke that can travel off the installation and potentially impact adjacent communities.

Light and Glare

This factor refers to man-made lighting (street lights, airfield lighting, building lights) and glare (direct or reflected light) that disrupts vision. Light sources from commercial, industrial, recreational, and residential uses at night can cause excessive glare and illumination, impacting the use of military night vision devices and air operations. Conversely, high intensity light sources generated from a military area (such as ramp lighting) may have a negative impact on the adjacent community.

Compatibility Assessment

LG-1: Lighting Impacts from Sheppard AFB	Lights at Sheppard AFB (i.e. the baseball field or ramp lights) are sometimes bright at night and the light projects off-base.
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Lights at Sheppard AFB (i.e. the baseball field or airfield lights) are sometimes bright at night and the light is seen by local residents. The brightest (and highest) lights on an airfield are on parking ramps, and the nearest housing development to the parking ramp is almost one-and-a-half miles away. While lights at Sheppard AFB can be seen from the nearby communities, it is not an everyday occurrence and may be accentuated by factors such as cloud cover reflecting the light further.

Conversely, there are four baseball / softball fields located on the western perimeter of Sheppard AFB (corner of Missile Road and Burkburnett Road). These fields are across the street (Burkburnett Road) from both privatized housing and a residential development. Given the height and orientation of the stanchions, it is possible that the lights from these fields shine onto the homes located nearest Burkburnett Road. It was also noted that the lights themselves are not overly bothersome, but rather that they remained on after play seemed to be a source of concern. Receiving feedback from the community on matters like excessive energy consumption is a great example of enhanced public discourse (COM-2).

Energy Development

Development of energy sources, including alternative energy sources (such as solar, wind, or biofuels) could pose compatibility issues related to glare (solar energy), vertical obstruction (wind generation), or water quality / quantity.

Compatibility Assessment

ED-1: Wind Turbine Development Near Sheppard AFB	There is some existing and proposed wind turbine development near Sheppard AFB (within 20 miles from digital airport surveillance radar [ASR]) that could impact operations.
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Wind towers become an issue on a larger commercial scale, not when sited individually on private property for personal use (as described in Issue VO-2). Commercial wind farms pose two types of concerns for military operations. Due to their size and height, they can be vertical obstructions for aircraft flying in the area. The locations of existing and proposed wind farms are far enough away from Sheppard AFB that they are not considered vertical obstructions. According to the American Wind Energy Association and the US Department of Energy, the JLUS Study Area is located in a region designated as “Fair” for wind power potential. Due to the large amount of open space in the area, the potential for large wind farms increases.

The second potential impact of wind farms on military operations is that they can potentially interfere with radar systems. Sheppard AFB utilizes a digital ASR system to monitor and track its aircraft during training flights. The presence of large wind farms can have several effects on radar systems, depending on the size of the farm, number of towers, distance between towers, height of towers, and distance from the radar. The two main impacts that large wind farms can produce are screening, or blocking out portions of the “field of view”, so that it cannot see aircraft that fly behind the “screen”, or causing false readings on the radar that make it appear there are aircraft flying in the area that are not really there.

While some wind development has already occurred in the region (southern Archer and Young counties in Texas and north of the City of Frederick in Oklahoma), it will be important to track future developments to minimize impacts on Sheppard AFB.

Air Quality

Air quality is defined by numerous components that are regulated at the federal and state level. For compatibility, the primary concerns are pollutants that limit visibility (such as particulates, ozone, etc.) and potential non-attainment of air quality standards that may limit future changes in operations at the installation or in the area.

Harmful impacts on regional air quality were examined and determined to not be a current or projected future issue. Wichita County is not currently in a non-attainment level with federal air quality standards, and it is not likely to reach non-attainment in the future. However, there was one issue identified during the JLUS process for air quality as a nuisance.

Compatibility Assessment

AQ-1: Smell of Jet Fuel / Exhaust

During winter months, with strong northern winds, sometimes the smell of burning jet fuel or jet exhaust goes off-base as jet aircraft are performing system checks and waiting for takeoff clearance.

Some nearby residents of Sheppard AFB commented that at times they can smell jet fuel or burnt jet fuel on their property. During the winter months, jets training or operating at Sheppard may require additional time to warm their engines for proper operations. This extended use of the engines while in a stationary position can produce smells that are more concentrated than when the aircraft are in motion or in the air. Depending on the weather, temperature, wind, and other factors, this smell can travel off-base and cause unpleasantness or potential health hazards for people more sensitive to such substances.

Frequency Spectrum Interference

Frequency spectrum impedance and interference refers to the interruption of electronic signals by a structure or object (impedance) or the inability to distribute / receive a particular frequency because of similar frequency competition (interference).

Compatibility Assessment

There were no current or projected future compatibility issues identified with frequency spectrum interference in the JLUS study area.

Public Trespassing

This factor addresses public trespassing, either purposeful or unintentional, onto a military installation. The potential for trespassing increases when public use areas are in close proximity to the installation.

Compatibility Assessment

There were no current or projected future compatibility issues identified with public trespassing in the JLUS study area.

Cultural Resources

Cultural resources may prevent development, apply development constraints, or require special access by Native American tribes, other groups, or governmental regulatory authorities.

Compatibility Assessment

CR-1: Limited Access to the Heritage Center Museum	The Heritage Center museum located on Sheppard AFB is difficult for the general public to access.
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The Heritage Center at Sheppard AFB is the original terminal building for the Wichita Falls Regional Airport that was constructed in 1928. In 1981, the Kell Air Field Terminal Building was dedicated as a Recorded Texas Historic Landmark, and in July 1991, it became a City of Wichita Falls landmark. Today it houses some important historical items for Sheppard AFB and the regional community. It has nearly 30 displays of historic photographs, uniforms, equipment, and scenes that showcase the history of the base, Wichita Falls, and the surrounding area dating back as far as the 1940s. The museum also includes a small theater with historical documentaries, a prisoners of war memorial, and a flight simulator room. The normal hours of operation of the Heritage Center are Monday through Friday from 9:00 am to 4:00 pm; however, since it is located on Sheppard AFB, it is sometimes difficult for civilians to access. Visitors can call the museum operator to arrange for a tour, but it may be difficult for someone driving up without a scheduled tour to get access to the base because of gate security.

Legislative Initiatives

Legislative initiatives are federal, state, or local laws and regulations that may have a direct or indirect effect on a military installation to conduct its current or future mission. They can also constrain development potential in areas surrounding the installation.

Compatibility Assessment

There were no current or projected future compatibility issues identified with legislative initiatives in the JLUS study area.

Water Quality / Quantity

Water quality / quantity concerns include the assurance that adequate water supplies of good quality are available for use by the installation and surrounding communities as the area develops. Water supply for agricultural and industrial use is also considered.

Compatibility Assessment

WQQ-1: Semiarid Climate Conducive to Flying Mission Occasionally Requires Water Management Strategies	Sheppard AFB Region's semi-arid climate is ideal for the flight training mission. However, this climate requires the governments in the region to cooperatively employ water management strategies during periods of rainfall deficits.
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Wichita Falls' semiarid climate provides a high number of flight training days. However, regional water providers must employ water management strategies during periodic rainfall deficits. The conservation component of these strategies has occasionally limited the use of water for landscaping purposes. Due to the successful employment of these water management strategies and the stable population of the area, water supply issues are unlikely to negatively impact existing or future missions of Sheppard AFB.

The City of Wichita Falls is the primary provider of water for the communities around Sheppard AFB. Wichita Falls provides water to area cities, water supply corporations, and special districts. Wichita Falls owns five reservoirs, Lake Arrowhead, Lake Kickapoo, Lake Kemp, Lake Diversion, and Lake Wichita. To supplement this supply, other water providers in the region also have small reservoirs and well fields.

The City of Wichita Falls is also developing future sources of water. Additional potential sources of water for the region include (1) reuse of existing wastewater flows, (2) development of Ringgold Reservoir (37 percent of which is on land currently owned by City of Wichita Falls), (3) desalination of unused Wichita River water, (4) importation from outside the region, and (5) development of groundwater sources, including brackish groundwater sources subject to purification (i.e. Burkburnett's well fields in Seymour Aquifer).

Existing Wichita Falls' reservoirs were developed in accordance with population projections that planned for a population in the region that is twice its current level. However, the City of Wichita Falls is currently experiencing a fourth year of below-normal rainfall,

including the state's worst summer in 2011 in terms of below-normal rainfall and above-normal temperatures.

In spite of this unprecedented rainfall deficit, the City has extended its water supply through several initiatives and continues to maintain a "Superior" rating for water quality, the highest rating in the water industry. To address water quality and quantity, area cities have implemented a number of conservation efforts and water reuse plans. Wichita Falls is currently handling drought-induced water availability issues by temporarily limiting the use of water for landscaping and other nonessential uses. The City of Wichita Falls has also established a wastewater reuse treatment system that will recycle treated wastewater effluent and treat it to federal and state Texas Commission on Environmental Quality (TCEQ) standards for distribution as drinking water. The City plans to produce five million gallons of water a day with this potable water reuse technology. Wichita Falls already treats brackish water from a nearby lake to drinking water standards; consequently, much of the treatment infrastructure for this water recycling system already exists.

Threatened and Endangered Species

A threatened species is one that may become extinct if measures are not taken to protect it. An endangered species is one that has a very small population and is at greater risk than a threatened species of becoming extinct. The presence of threatened and endangered species may require special development considerations and should be included early in planning processes to ensure compatibility with military missions and economic development objectives.

Compatibility Assessment

TE-1:

**The Texas
Horned Lizard
Lives Near
Sheppard
AFB**

The Texas horned lizard, a species that has declined in the last 50 years due to farming and introduction of fire ants, lives on and around Sheppard AFB.

Although there are no federally listed threatened or endangered species known to exist on Sheppard AFB, Texas horned lizards have been observed within and near the northern boundary, but have declined in population in the past few decades. Their primary diet consists of harvester ants, which are disturbed by farming and killed by imported fire ants. If they

become registered as a federally listed threatened or endangered species, and remain present at Sheppard AFB when such listing occurs, then such listing could increase the documentation needed to comply with the Federal Endangered Species Act when expanding facilities.

Texas horned lizards are listed by the Texas Parks and Wildlife Service as a threatened species. Texas Parks and Wildlife regulations prohibit the taking, possession, transportation, or sale of a state-listed species without a permit. This does not affect federal operations.

Scarce Natural Resources

Pressure to gain access to valuable natural resources (such as oil, natural gas, minerals, and water resources) located on military installations, within military training areas, or on public lands historically used for military operations, can impact land utilization and military operations.

Compatibility Assessment

There were no current or projected future compatibility issues identified with scarce natural resources in the JLUS study area.

Land / Air Spaces

The military manages or uses land, air space to accomplish testing, training, and operational missions. These resources must be available and of a sufficient size, cohesiveness, and quality to accommodate effective training and testing. Military and civilian air operations can compete for limited air space, especially when the airfields are in close proximity to each other. Use of this shared resource can impact future growth in operations for all users.

Compatibility Assessment

LAS-1:

**Inability to
House
Additional
Aircraft**

Sheppard AFB is a divert airfield for Dallas-Fort Worth (DFW), but has limited extra apron space for aircraft in the event that it was needed for multiple aircraft landings.

Arrangements that have been made (FAA directive, MOU, or other agreement) between the DFW airport and Sheppard AFB / Wichita Falls Regional Airport allowing diversion of aircraft to Sheppard AFB / Wichita Falls Regional Airport would need to be examined to determine if this is an issue that can be

addressed either through the JLUS process or by other means. Most likely, this issue is one that exists between airport officials of each participating airport. Operations and capacity of Sheppard AFB / Wichita Falls Regional Airport need to be reviewed to improve or facilitate efficient storage of aircraft in an emergency. Other options would need to be identified and instituted such as use of Frederick Regional Airport for overflow for smaller or lighter aircraft. Inquiries to the DFW airport officials should be made to determine if other airports are part of their diversion plans and if not, whether that could be a consideration. Questions arise as to the need to expand Sheppard AFB / Wichita Falls Regional Airport capacity and the feasibility of such actions.

Frequency Spectrum Capacity

In a defined area, the frequency spectrum is limited. Frequency spectrum capacity is critical for maintaining existing and future missions and communications on installations. This is also addressed from the standpoint of consumer electronics.

Compatibility Assessment

There were no current or projected future compatibility issues identified with frequency spectrum capacity in the JLUS study area.

Roadway Capacity

Roadway capacity relates to the ability of existing freeways, highways, arterials, and other local roads to provide adequate mobility and access between military installations and their surrounding communities.

Compatibility Assessment

RC-1: Traffic Back-ups at Gates	Sometimes during high volume traffic (i.e., mornings or rush hour), traffic waiting to get onto Sheppard AFB can back up civilian traffic using the same roads.
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One of the top priorities at a military installation is keeping the installation secure, which involves the screening of vehicles and individuals passing through the gates onto the base. A single vehicle entering the base generally does not take a long time to process with the proper documentation; however, during times of heavy traffic flow onto Sheppard AFB, the time it takes to move vehicles through the gates increases. Intersections that lead to the gates are signalized,

which adds to traffic congestion, particularly during the morning or evening rush hours. This base traffic can sometimes have an impact on civilian traffic since the road that runs parallel to Sheppard AFB (Burkburnett Road) is a primary north-south connector for Wichita Falls and the communities to the north. Road congestion has been identified to occur at both the main gate on the south side of Sheppard AFB, along Burkburnett Road, and at the Missile Road Gate on the west side, with traffic back-ups occurring on Burkburnett Road and Missile Road.

RC-2: Limited Options for Transportation Between Sheppard AFB and Areas Outside the Base	Many of the students at Sheppard AFB do not have their own form of transportation while on-base, making it difficult for them to get off-base for shopping, dining, or entertainment purposes.
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Sheppard AFB is primarily a training base for Air Force students and personnel. This means that a large percentage of the people on the base at any given time are there on a temporary basis and do not always have amenities such as a private vehicle to go off-base for the purposes of shopping, eating, or entertainment. This is especially true of foreign students enrolled in the flight training programs. The City of Wichita Falls' FallsRide transit program offers shuttle transportation for military members through the Sheppard Express Route 6. The shuttle service picks up and drops off at various locations around Sheppard AFB and transports riders to Sikes Senter Mall. The route runs in one hour intervals. The Sheppard Express has been a good way for Air Force students to get off-base and into the city, but it currently only takes them to one location outside of Sheppard AFB. However, from this location, they can access public transportation to other bus routes and areas of the city. If desired, taxi service options are also available.

5.3 Frederick Regional Airport Study Area Compatibility Factors

Interagency Coordination

Compatibility Assessment

COM-1: Continuous Communications

It will be important for Sheppard AFB, Frederick Regional Airport, the City of Frederick, and Tillman County to maintain good communication for military usage of Frederick Regional Airport.

Even though Frederick Regional Airport is 38 nautical miles from Sheppard AFB and an hour by surface travel, Air Force personnel and members of the Frederick community need to engage in more proactive dialogue. It is vital to have adequate and timely communication between Air Force personnel (Sheppard AFB) and agencies and organizations engaged in planning and resource management in the study area. Whether it's discussing proposed development in the City of Frederick or Tillman County, or a change in effluent discharge on the airfield, issues impacting Sheppard AFB flight operations should be discussed with base personnel. Similarly, Sheppard AFB personnel should keep County and City leaders (including the Frederick Regional Airport Commission) apprised on all issues impacting Frederick Regional Airport and issues impacting the greater Sheppard AFB area of influence (which extends well onto Oklahoma).

It is also important to keep the citizens in the local communities informed of any changes in operations or schedules that may affect them. Citizens also expressed interest in wanting to know typical flight schedules of aircraft because they enjoy watching the aircraft fly.

Land Use

Compatibility Assessment

LU-1: Lack of Zoning and Land Use Controls

The jurisdictions surrounding Frederick Regional Airport do not utilize the full extent of land use control tools to ensure compatible development around the airport.

Proper land use and land use controls are critical for compatibility. The lack of zoning regulations and land use controls is not only a potential threat to long-term military operations, it is vitally important to protecting the public health, safety, and welfare. Directly linked to this issue are two other issues for the Frederick Regional Airport (SAF-3 and VO-1) under the "Safety" and "Vertical Obstructions" compatibility factors, respectively.

Although Tillman County does not currently have zoning regulations, it can enact zoning regulations through Oklahoma State Statute §19-863.1. Pursuant to this authority, Tillman County could develop some limited zoning regulations to protect the land around Frederick Regional Airport from incompatible development, particularly within aircraft safety zones.

Safety

Compatibility Assessment

SAF-1: Bird Aircraft Strike Hazards (BASH)

The presence of birds and bird attracting land uses around Frederick Regional Airport can pose dangers for pilots and aircraft operating in the area.

Bird Air Strike Hazards (BASH) are an unfortunate consequence of virtually every flying operation, but they need not be catastrophic. Neither Frederick Regional Airport officials nor Sheppard AFB Flight Safety personnel were aware of any recent significant BASH concerns, but it remains an issue that should be monitored. The focus of this issue is aircraft safety as it relates to bird attractants in the area, which includes certain agricultural practices, use of effluent to irrigate airfield area, and proximity to Hackberry Flat Wildlife Management Area (WMA).

The Hackberry Flat WMA covers 7,120 acres of land approximately eight miles outside of Frederick. The current status of the Hackberry Flat WMA does not

pose a concern for BASH because of drought conditions and the area being mostly dry. If significant water returns to the region and the lakes and ponds at Hackberry Flat reach a level where large quantities of birds are located there, then some action may be needed to mitigate BASH. Hackberry Flat has 4,000 acres that can be flooded.

Other sources of BASH in the area are found on agricultural lands where large flocks of birds have sometimes been observed in close proximity to Frederick Regional Airport. While there is no BASH plan currently for the airport, there are some mitigation measures in place and if BASH becomes too much of a concern on a given day, operations will be altered or stopped until the BASH concern subsides.

SAF-2: Safety of Crop Dusting Operations	Usage of civilian crop dusting aircraft in the vicinity of military operations near Frederick Regional Airport are a concern for mid-air collisions.
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Interviews with both Frederick Regional Airport officials and Sheppard AFB personnel did not reveal any recent incidents (or near miss occurrences) with military aircraft and crop dusters. However, due to the catastrophic nature of such an incident and the fact that aircraft used for aerial applications (crop dusting, etc.) can operate at low altitudes and with frequent passes in the area, it is vitally important for all crop duster pilots to be aware of the daily operations of Frederick Regional Airport.

There was a collision between a crop duster aircraft and a military aircraft that resulted in the death of the crop duster pilot over 10 years ago. This pilot was not from the region and unaware of military activity at Frederick Regional Airport. Crop dusting pilots in the region are generally aware of the frequency of use of the airport by the military and fly around the schedules of Sheppard AFB aircraft.

SAF-3: Clear Zones and Accident Potential Zones Extend Off-Base	The runway safety zones associated with the runway used by the military at Frederick Regional Airport extend past the boundaries of the airport. While the other runways at Frederick Regional Airport are not currently used by Sheppard AFB aircraft, they could possibly be in the future, and their safety zones also extend past the boundaries of the airport.
--	--

The CZs and APZs associated with runways at Frederick Regional Airport extend outside the airport property onto privately owned land. Within these areas, the airport and the Air Force have no control over the type of development that occurs in the safety zones, which could result in incompatible development. The absence of land use controls creates a series of concerns, including public safety, pilot safety, and hazards to aircraft.

Currently only Runway 17/35 is used by Sheppard AFB for military flight training. An Airport Clearance Easement was signed between the City of Frederick and the property owners within this runway's CZ south of Frederick Regional Airport in 1981 that stated that no obstructions shall occur on the land. This was during the time when Frederick Regional Airport had an active AICUZ in place; the CZ may be slightly different now than it was then. However, because the AICUZ has not been updated, it is not certain whether there is additional land within the CZ outside of the land covered by the easement.

There is currently minimal development within Runway 17/35's CZs and APZs. No development exists within the CZs, and the majority of the land in the APZs I and APZs II is used for agriculture or open space. There is one residential structure located in the southern APZ I that is incompatible with this safety zone. In the northern APZ II, the Great Plains Technology Center in the City of Frederick is incompatible with APZ II because it could contain a concentration of people. The locations of these incompatible uses are shown on Figure 5-6.

Although Runways 12/30 and 3/21 are not currently used by the Air Force, there is a potential that they could be in the future. Since they are not used by the

Air Force, they do not have CZs and APZs associated with them. For the purposes of this analysis, the CZ and APZ dimensions used for Runway 17/35 have been applied to Runways 12/30 and 3/21. However, the actual dimensions for these safety zones, if calculated, could be smaller than those shown on Figure 5-6 due to the size and type of runways.

Vertical Obstructions

Compatibility Assessment

VO-1:

Airport Height Regulations Around Frederick Regional Airport

The jurisdictions surrounding Frederick Regional Airport do not currently utilize tools that regulate heights in the area.

The lack of zoning regulations in the area surrounding the airport could result in the development of structures with heights that pose a threat to safe airfield operations. The absence of land use controls creates a series of potential issues including lack of height regulations. It is possible that unrestricted development of structures could impede upon the aircraft safety. More specifically, tall structures, to include cell towers, power line infrastructure, water tanks, etc., have the potential to extend into vertical safety planes and create unsafe flying conditions.

Frederick developed height regulations for aircraft operation areas, adopted by the Joint Airport Zoning Board in 1980. Although it is unclear whether this zoning regulation applies to unincorporated Tillman County, the language of the ordinance implies that it includes county land. These regulations have not been updated for more than 30 years, and are not commonly enforced or utilized in the region. There are several communications towers in the vicinity of Frederick Regional Airport that may be tall enough to be considered vertical obstructions, but may not have been properly assessed before they were erected.

Figure 5-7 illustrates the Approach-Departure Clearance Surface and Inner Horizontal Surface for Runway 17/35 at Frederick Regional Airport. These are the imaginary surfaces that pose the greatest concern for potential vertical obstructions that could impact aircraft operations.

Runways 12/30 and 3/21 are not currently used by the Air Force, but there is a potential that they could be in the future. For the purposes of this analysis, the Inner Horizontal Surface and Approach-Departure Clearance Surface dimensions used for Runway 17/35 have been applied to Runways 12/30 and 3/21. The actual dimensions for these imaginary surfaces, if calculated, could be smaller than those shown on Figure 5-7 due to the size and type of runways.

Noise

Compatibility Assessment

NOI-1:

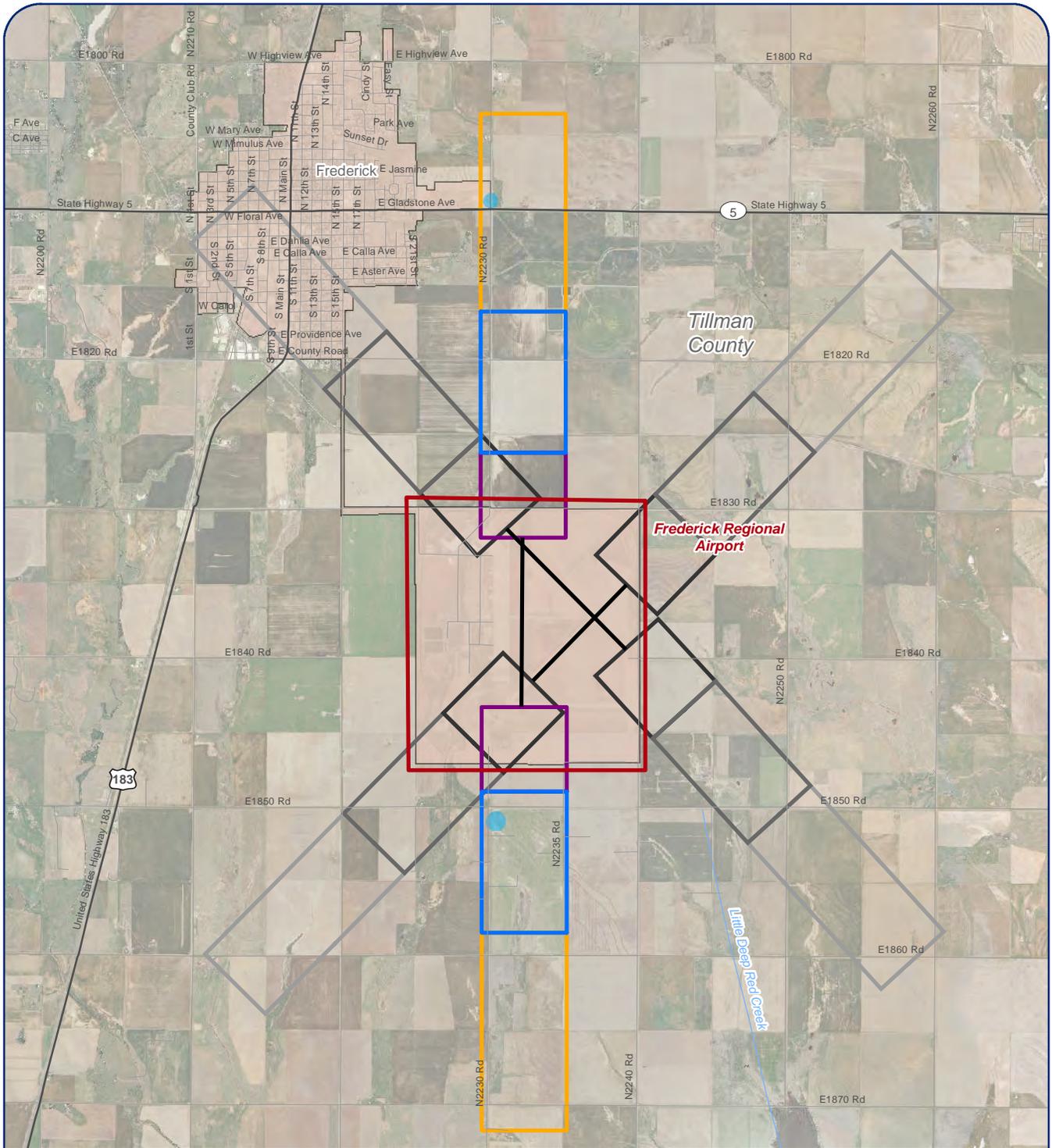
Noise From Aircraft Operations

Noise from military aircraft using Frederick Regional Airport can be heard outside the boundaries of the facility.

Despite nearly 150 sorties per day (the majority of which are “touch-and-goes”), there are no registered noise complaints (according to Sheppard AFB Public Affairs) from the residents of the City of Frederick or Tillman County. This is most likely attributable to both the approach end and departure end of the runway being far removed from concentrations of people (residential, commercial, industrial, etc.) and that most operations occur with the T-6 Texan, which is a relatively quiet aircraft. Because there are a significant number of low-level aircraft flights over privately owned lands, if left unaddressed, noise may eventually become an issue.

An AICUZ study was developed for military operations at Frederick Regional Airport in 1980, but has not been updated since. The study included noise contours, which were minimal, but did extend past the boundaries of the airport. However, since these noise contours have not been updated in over 30 years, there are no mappable noise contours for Frederick Regional Airport.

The rural nature of the region often experiences louder noises than aircraft from semi-trucks traveling on the roads or farm equipment on agricultural lands. No major noise concerns were raised at the public meetings held during the JLUS process. Sheppard AFB does record noise complaints received and investigates the cause and works with the complainant when necessary to resolve the issue.



Legend

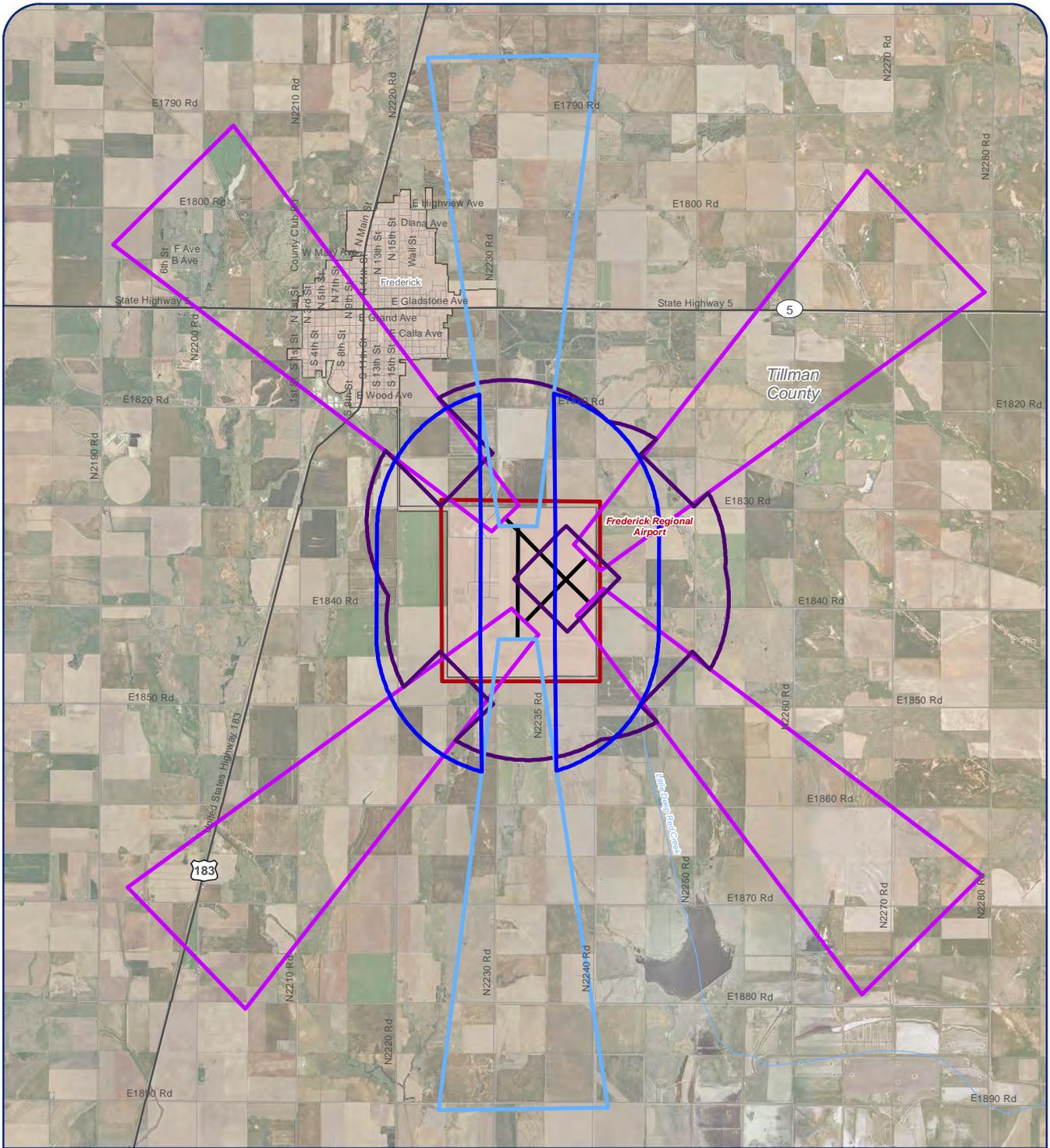
- | | | | | |
|---|----------------------|----------------------------|---------------------------|-------|
| Potentially Incompatible Lands Under Runway Safety Zone | Clear Zone | Runway Safety Zone | Airport Runway | Road |
| APZ I | Estimated Clear Zone | Frederick Regional Airport | Community Covered by JLUS | River |
| APZ II | Estimated APZ 1 | Estimated APZ 2 | Highway | |



0 0.5 1 Miles

Sources: City of Wichita Falls, 2012; OCGI, 2012.

Figure 5-6
Frederick Regional Airport Runway Safety Zones



Legend

Imaginary Surface MCA

- Inner Horizontal Surface
- Approach-Departure Clearance Surface

Estimated Imaginary Surface MCA

- Estimated Inner Horizontal Surface
- Estimated Approach-Departure Clearance Surface

Airport Runway

- Frederick Regional Airport
- Community Covered by JLUS

Road

- Road
- River
- Highway



0 1 2 Miles
Sources: City of Wichita Falls, 2012; OCGI, 2012.

**Figure 5-7
Frederick Regional Airport Runway Imaginary Surfaces**

Dust / Smoke / Steam

Compatibility Assessment

**DSS-1:
Dust From
Agricultural
Operations**

Dust caused by agricultural operations can affect visibility of aircraft.

Based on environmental conditions, such as wind speed and direction, amount of rainfall, humidity, etc. there is the potential for agricultural operations on farms surrounding Frederick Regional Airport to generate dust that may interfere with aircraft operations. These potential dust events occur mostly during arid conditions and times of increased activity (plowing, planting, harvesting, etc.).

Prescribed burns on agricultural land or open space can also impact pilot visibility. Prescribed burns are coordinated through several entities, including the land owner, fire department, sheriff’s department, and the US Department of Agriculture.

Energy Development

Compatibility Assessment

**ED-1:
Wind Turbine
Development
Near
Frederick
Regional
Airport**

There is a potential for wind turbine farm development near Frederick Regional Airport in the future, which could have potential impacts on military operations at the airport.

As the nation continues to push for renewable energy sources, competition for resources will increase. One of these resources will be land, as developers seek wide open spaces to install wind farms, massive solar arrays, etc. According to the US Department of Energy (American Wind Energy Association, Department of Energy National Renewable Energy Laboratory, 2006), the area surrounding Frederick Regional Airport is considered a Class 2 wind power region, which makes it a “fair wind resource potential” area. It should be noted that the area of interest is close to a Class 3 region, which changes the status to a “good wind resource potential” area.

Though there are no current plans to construct a wind farm near Frederick Regional Airport, there is the

potential for wind turbine development in the area that could impact future air operations.

Generally, the installation of personal wind towers (which are typically shorter than 50 feet in height) on residential land is not a concern that would impact flight operations, provided they are not located within the runway safety zones or the Approach-Departure Clearance Surfaces. If a resident wishes to erect a personal wind tower on their land, this would be determined on a case-by-case basis.

Frequency Spectrum Impedance and Interference

Compatibility Assessment

**FSI-1:
Interference
with
Transmissions
in the Area**

There is a potential for military and civilian users to interfere with each other’s use of frequencies.

With ever increasing use of electronic devices and continuous competition for frequency spectrum, it is important for individuals and organizations at and around Frederick Regional Airport to de-conflict frequency use. Local manufacturing operations and precision agricultural equipment both utilize frequency spectrums that have the potential to interfere with aircraft communications. However, it is unlikely that any major interference will occur due to the rural nature of the region surrounding the airport, and frequencies used by military operations are generally separated from those used by civilian and other users. This is an issue that should be monitored in the future if any new type of development or frequency users locate in the region in the future.

Public Trespassing

Compatibility Assessment

**PT-1:
Trespassing
on the Airport**

The potential for public trespassing on Frederick Regional Airport exists because there is not a secure fence around the entire airport perimeter.

Frederick Regional Airport is not completely enclosed by fencing. Specifically, the eastern border has very little natural or manmade barriers to keep trespassers

off the property. Portions of the airport fence were taken down during maintenance or damaged from weather events, and were never replaced, leaving portions of the airport open. Trespassers have been found on portions of the airfield. With no physical barrier, livestock and other wildlife can wander onto the airfield, posing a significant risk to aircraft operations.

The rural nature of the area around the airport, and minimal occupancy of the airport means that there is the chance that trespassers would not be noticed on airport property. The primary concern for trespassers is safety of individuals on the ground if aircraft are performing touch-and-goes, but there is also a concern from an anti-terrorism / force protection aspect as pilots would not know the intentions of someone on the ground who shouldn't be there.

The City of Frederick recently received funding from the Oklahoma Water Resources Board to install five-strand barbed wire fencing around the airport perimeter, which will provide deterrence to trespassing onto the property. The installation of this fence is scheduled to be completed in the fall of 2014.

Scarce Natural Resources

Compatibility Assessment

SNR-1: Exploration and Extraction

There may be competition for land area between airport uses and oil extraction in the future.

There are a number of active jack-pumps on the airport property and the City of Frederick receives annual royalties for oil extraction. Oil fields previously not economical to mine may become suitable, creating a conflict between extraction activities on or near the airport and aircraft operations. While currently-installed oil pumps are already known and acknowledged by pilots, if additional oil pumps are installed outside the airport then they could potentially pose hazards to aircraft operations if not coordinated with Frederick Regional Airport and Sheppard AFB to mitigate any potential concerns.

5.4 Compatibility Tools

The Implementation Plan recommends JLUS strategies intended to guide appropriate development to maintain the operational capabilities of Sheppard AFB, while facilitating economic development of the region and protecting the health and welfare of all community members.

The following provides a brief definition and assessment for each JLUS compatibility strategy type to ensure a common understanding exists among the various entities responsible for implementation, either in their role as the primary entity or as a support partner.

- Acquisitions
- Capital Improvement Programs
- Communication/Coordination
- Plans and Programs
- Habitat Conservation Tools
- Legislation
- Memorandum of Understanding (MOU)
- Real Estate Disclosures
- Zoning
- Subdivision Regulations

Acquisitions

Property rights comprise a bundle of privileges attached to each parcel of land, and include the right to possess, use, develop, lease, or sell the land. As a compatibility planning tool, all or some of these property rights can be acquired through donation, easement, or purchase for public purposes. The types of acquisition could include the following:

- **Fee Simple Acquisition.** This option involves the purchase of property and is typically the most costly method to protect open space, sensitive, or critical areas. The cost to purchase property and/or the need to have a willing seller may make this acquisition tool difficult to implement.
- **Fee Simple Leaseback.** An example of a leaseback is when a government agency purchases the full title to a property and then leases it back to the previous owner. The land's natural resource and open space are protected through lease controls that restrict land uses.

- **Conservation Easement.** A conservation easement is a way to protect a buffer, natural resource, open space area, or agricultural value of land by retaining it in its current state. The owner maintains ownership of the property and the right to sell or deed the property to another. The owner also retains the right to use the property for economic gain or recreation as long as the use is allowed by the conditions of the easement. Conservation easements can be acquired through several mechanisms, including donation or purchase. If they are donated, the donor could qualify for a federal income tax deduction, making this option more desirable to the property owner. Conservation easements are typically a more cost effective method to restrict incompatible development as compared with outright purchase.
- **Lease.** In cases where the landowner does not want to, or cannot make a permanent commitment, the execution of a lease may be a way to control land uses for a short time. Leases can be obtained by government agencies or jurisdictions, non-profit organizations, land trusts, or private entities.
- **Management Agreement.** A management agreement is a specified plan under which the landowner or the land trust (or a combination thereof) will manage the land. Management agreements identify a specific amount of time making them a short-term approach to protecting land.
- **Eminent Domain.** A local government can use the power of eminent domain to acquire private property for public use, in exchange for payment of fair market value, through the process of condemnation.

The purpose of acquisition tools is to eliminate land use incompatibilities through market transactions and the local development process. Acquisition tools are particularly effective because they advance the complementary goals of shifting inappropriate uses away from military installations and preserving community assets such as agriculture, open space, rural character, or sensitive natural habitats.

Examples where property acquisition strategies have been used to address compatibility issues include:

- Creating a buffer between active military installations and incompatible land uses;
- Shifting future growth away from critical military lands;
- Protecting public safety by limiting incompatible land uses;
- Protecting the natural environment; and
- Conserving open space.

Capital Improvements Plan

A capital improvements plan (CIP) is a detailed fiscal and planning document used to identify, direct, and prioritize a jurisdiction's or agency's (federal, state or local) investment in capital facilities, including infrastructure. A CIP expresses a typical six-year timeframe of facility plans and programs of the jurisdiction or agency and provides details on expenditures that can be incorporated into the jurisdiction's or agency's annual budgeting process.

Jurisdictions can influence where and when growth will take place through capital investment decisions, such as the placement of roadways or other infrastructure systems. In addition to facility planning and design, the timing of the facilities is also a critical component to promote compatibility. It has been proven in communities throughout the United States that in areas where infrastructure is extended, growth will follow.

Building on lessons learned, and in order to discourage non-compatible land uses, it is important that infrastructure is not extended within the Sheppard AFB JLUS Study Area without developing a compatible land use plan, and an infrastructure plan that supports the land use plan for this area. The premature extension of infrastructure can encourage growth in an area. Conversely, the lack of funding for regional transportation projects can cause roadway capacity constraints in the short term.

Communication/Coordination

In any planning effort, plans can only move toward successful implementation if frequent ongoing communication is maintained among the local jurisdictions, Sheppard AFB, state and federal agencies, landowners, and the public. Enhanced communication and coordination is an integral component to successful compatibility planning in support of the military's existing and potentially enhanced future mission(s).

Plans and Programs

A comprehensive plan is a long-range plan that outlines goals and policies to guide the physical development of a municipality. Comprehensive plans are designed to serve as the jurisdiction's blueprint for future decisions concerning physical development, including land use, infrastructure, public services, and resource conservation. Most comprehensive plans consist of written text discussing the community's goals, objectives, policies, and programs for the distribution of land use as well as one or more diagrams or maps illustrating the general location of existing and future land uses, roadways, city administered facilities and parks and open space. The primary goals of the comprehensive plan are to:

- Identify the community's land use, circulation, environmental, economic, and social goals and policies as they relate to future development in the community;
- Provide a basis for local government decision making, including decisions on development approvals;
- Provide citizens with opportunities to participate in the planning and decision making processes in their communities; and
- Inform citizens, developers, decision makers, and other cities and counties of the policies that guide development within a particular community.

Habitat Conservation Tools

The federal Endangered Species Act (ESA) allows for the development of Natural Community Conservation Plans (NCCPs) and Habitat Conservation Plans (HCPs). An NCCP identifies and provides for the regional or area-wide protection of plants, animals, and their habitats, while allowing compatible and appropriate economic activity.

Incidental take permits help landowners legally proceed with activities that might otherwise result in illegal impacts to a listed species. An HCP is a document that supports an incidental take permit application pursuant to section 10(a)(1)(B) of the ESA. HCPs are an evolving tool. Initially designed to address individual projects, HCPs are currently more likely to be broad-based plans covering a large area. The geographically broader HCP is used as the basis for an incidental take permit for any project within the boundaries of the HCP. Regardless of size, an HCP should include measures that, when implemented, minimize and mitigate impacts to the designated species to the maximum extent possible, and identify the means by which these efforts will be funded.

The primary objective of the NCCP and HCP programs is to conserve natural communities at the ecosystem level while accommodating compatible land use. The programs seek to anticipate and prevent the controversies and gridlock that can be caused by species' listings. Instead, they focus on the long-term stability of wildlife and plant communities. The programs also include key stakeholders in the development process for the plan.

In relation to compatibility planning, this strategy type can be used to provide mechanisms to ensure species protection while allowing compatible development in areas surrounding Sheppard AFB.

Legislation

State legislation can have a significant impact on compatibility planning by allowing, restricting or limiting the tools available to local jurisdictions to control land use planning activities. Legislative strategies are designed to encourage changes in state law to accomplish a desired end state. Under Texas law, local jurisdictions are provided with certain powers over which they can regulate land uses and activities. If additional local control is desirable, state enabling legislation would be required to create or amend existing regulatory authority.

On the local level, new or expanded regulation would be accomplished through the development, consideration, and passage of new ordinances or procedures. These changes would need to be consistent with the provisions of state law.

Memorandum of Understanding (MOU)

A Memorandum of Understanding (MOU) is a contract between two or more government entities. The governing bodies of the participating public agencies must take appropriate legal actions, often adoption of an ordinance or resolution, before such agreements become effective. These agreements are also known as Joint Powers Agreements or Inter-local Agreements.

The purpose of an MOU is to establish a formal framework for coordination and cooperation. These agreements may also assign roles and responsibilities for all of the agreement's signatories. MOUs generally promote:

- Coordination and collaboration by sharing information on specific community development proposals, such as re-zonings and subdivision plats;
- Joint communication among participating jurisdictions, agencies and the military ensures that residents, developers, businesses, and local decision makers have adequate information about military operations, possible impacts on surrounding lands, procedures to submit comments, and any additional local measures to promote land use compatibility around installations; and
- Formal agreement on cooperative land use planning activities, such as implementation of the recommendations provided in this JLUS.

Real Estate Disclosure

Prior to the transfer of real property to a new owner, real estate disclosures require sellers and their agents to disclose certain specified facts related to the condition of the property. These facts could include noise or other proximity impacts associated with property near a military installation or operations area. The purpose of real estate disclosure is to protect the seller, buyer, and sales agent from potential litigation resulting from specified existing and/or anticipated conditions (i.e., hazard areas, existing easements). Disclosures are perhaps the most practical and cost effective land use compatibility tools for the reason that the buyers are informed of the possible affects (noise, light, etc.) for lands proximate to a military installation prior to considering purchase.

Zoning / Building Codes

The primary purpose of zoning is to protect the public health, safety and welfare. Zoning is a regulatory tool that enables the division of a jurisdiction into districts (zones) within which permissible uses are prescribed and allowable building height, bulk, layout, and other requirements are defined, as identified in the following examples.

Protection against:

- Physical danger, particularly safety considerations for properties in proximity to military ranges or within military flight areas;
- Nuisances associated with military operations, such as noise, vibration, air emissions, etc.;
- Heavy traffic flows or truck routes in residential areas;
- Psychological nuisances, such as perceived and actual dangers associated with military operations;
- Light and glare, air emissions, and loss of privacy; and
- Loss of open space and agricultural preservation.

Zoning ordinances requiring rigid separation of uses or inflexible provisions can make creative solutions to land use compatibility, such as cluster development, difficult or impossible. When designating military compatible use districts, the ordinance should recognize that the local community has no regulatory control over development or activities on federal property, and that the military only has regulatory authority on federal lands, and not on lands within a city or county.

Construction standards and building codes are ordinances and regulations controlling the design, construction process, materials, alteration, and occupancy of any structure to ensure human safety and welfare. They include both technical and functional standards and generally address the following in terms of compatibility issues.

- **Structural Safety.** Buildings should be designed for environmental factors in the area and man-made issues, such as vibration.
- **Sound Attenuation.** Sound attenuation refers to special construction techniques and materials designed to reduce the amount of noise that penetrates the windows, doors, and walls of a building.

Subdivision Regulations

Land cannot be divided without local government approval except for when land is divided into parts greater than five acres, where each part has access, and no public improvement is being dedicated. The local comprehensive plan, zoning, subdivision, and other ordinances govern the design of a subdivision, the size of its lots, and the types of required improvements; such as street construction, sewer lines, water lines and drainage facilities. Applications for subdivisions must be submitted to the local government for consideration. Subdivision regulations set forth the minimum requirements deemed necessary to protect the health, safety, and welfare of the public. More specifically, these regulations are designed to accomplish the following initiatives:

- Assure that effective protection is provided for the natural resources of the community, especially groundwater and surface water;
- Encourage well-planned subdivisions through the establishment of adequate design standards;
- Facilitate adequate provisions for transportation and other public facilities;
- Secure the rights of the public with respect to public lands and waters;
- Improve land records by the establishment of standards for surveys and plats;
- Safeguard the interests of the public, the homeowner, the subdivider, and units of local government; and
- Prevent, where possible, excessive governmental operating and maintenance costs.

For More Information Contact:

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