This study was prepared under contract with the City of Abilene with financial support from the Office of Economic Adjustment, Department of Defense. The content reflects the views of the key JLUS partners involved in the development of this study and does not necessarily reflect the views of the Office of Economic Adjustment.
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Policy Committee

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

City of Abilene
- Anthony Williams, Mayor
- Norm Archibald, Former Mayor

City of Tye
- Roy Votaw, Mayor
- Nancy Moore, Former Mayor

Taylor County
- Downing Bolls, County Judge

Property Owner
- Tom LeVieux, View / Caps Community

Dyess Air Force Base
- Colonel Brandon D. Parker, Commander, 7th Bomb Wing
- Colonel David M. Benson, Former Commander, 7th Bomb Wing

Technical Advisory Committee

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

- Brad Birchum, County Commissioner, Precinct 3 Taylor County
- Gray Bridwell, Chairman Military Affairs Committee
- DeWayne Bush, Constable, Precinct 3 Taylor County
- Vada Childers City of Tye
- Tommy Downing, AICP, Community Planner Dyess Air Force Base
- Shawn Hicks, Assistant Police Chief City of Tye
- Belinda Hohhertz, City Secretary City of Tye
- Lieutenant Colonel Max E. Johnson, Deputy Commander, 7th Mission Support Group Dyess Air Force Base
- Randahl Lohse, Property Owner View / Caps Community
- Gayle Potter, In Memory Of, Property Owner View / Caps Community
- Shane Price, Abilene City Council City of Abilene
- Dennis Reiling, Property Owner View / Caps Community
- Captain Daniel D. Venable, Airfield Operations Flight Commander, 7th Operations Support Squadron Dyess Air Force Base
- Jerry Walls, Property Owner View / Caps Community
- Dwight Williams, 7th Operations Support Squadron Airspace Manager Dyess Air Force Base
- Randy Williams, County Commissioner, Precinct 1 Taylor County
- Brian Yates, Former Vice President, Military Affairs Abilene Chamber of Commerce
City of Abilene

The City of Abilene served as the overall JLUS project management agency and the administrator of the Office of Economic Adjustment grant that helped to fund the study.

- Don Green, A.A.E.
  Director of Transportation Services

Development Corporation of Abilene

The local grant match to support the funding of this JLUS process was graciously provided by the Development Corporation of Abilene.

JLUS Consultant / Technical Advisors

Matrix Design Group was the project consultant hired to conduct the JLUS project through coordination with and assistance from the City of Abilene, the PC, the TAC, the public, and other stakeholders.

- Celeste Werner, AICP
  Project Manager
- Mike Hrapla
  Deputy Project Manager
- Bren Cox, AICP
  Lead Planner

Special Appreciation

The City of Abilene wishes to recognize and thank all the residents, property owners, community leaders, and other stakeholders for their participation in the workshops and public meetings.
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<td>Roadway Capacity</td>
</tr>
<tr>
<td>RCS</td>
<td>Recovery Credit System</td>
</tr>
<tr>
<td>REPI</td>
<td>Readiness and Environmental Protection Integration</td>
</tr>
<tr>
<td>RF</td>
<td>Radio Frequency</td>
</tr>
</tbody>
</table>

## S

<table>
<thead>
<tr>
<th>Acronym</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>SA</td>
<td>Safety</td>
</tr>
<tr>
<td>SAC</td>
<td>Strategic Air Command</td>
</tr>
<tr>
<td>SB</td>
<td>Senate Bill</td>
</tr>
<tr>
<td>SHPO</td>
<td>State Historic Preservation Office</td>
</tr>
<tr>
<td>SIP</td>
<td>State Implementation Plans</td>
</tr>
<tr>
<td>SNR</td>
<td>Scarce Natural Resources</td>
</tr>
<tr>
<td>SSC</td>
<td>Southern Switching Company</td>
</tr>
</tbody>
</table>

## T

<table>
<thead>
<tr>
<th>Acronym</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>TAC</td>
<td>Technical Advisory Committee</td>
</tr>
<tr>
<td>TIA</td>
<td>Takings Impact Assessment</td>
</tr>
<tr>
<td>TPWD</td>
<td>Texas Parks and Wildlife Department</td>
</tr>
<tr>
<td>TREC</td>
<td>Texas Real Estate Commission</td>
</tr>
<tr>
<td>TSS</td>
<td>Training Systems Squadron</td>
</tr>
</tbody>
</table>
### Acronyms

#### U
- **UAS**  Unmanned Aerial System
- **USAHAS**  US Avian Hazard Advisory System
- **USFWS**  US Fish and Wildlife Service

#### V
- **V**  Vibration
- **VFR**  Visual Flight Rules
- **VO**  Vertical Obstructions

#### W / X / Y / Z
- **WQQ**  Water Quality / Quantity
Please see the next page.
1.1 What Is a Joint Land Use Study? .......................... 1-2
1.2 Why Prepare a Joint Land Use Study? ............. 1-3
1.3 Local Communities Working Together .......... 1-5
1.4 Public and Stakeholder Outreach ................... 1-6
1.5 JLUS Study Area ........................................ 1-9
1.6 JLUS Organization ...................................... 1-11

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 / not recommended development has been a factor in the loss of training operations and restructuring of mission-critical components at installations across the country. To protect the missions of military installations and the health of the local economies that rely on them, encroachment issues and the possibility of future issues must be addressed through collaboration and joint planning between installations, local jurisdictions, state agencies, and other stakeholders. This Joint Land Use Study (JLUS) attempts to mitigate current and future compatibility issues and strengthen coordination between the local communities and Dyess Air Force Base (AFB).

There are several jurisdictions and communities around Dyess AFB that participated in this JLUS effort: Taylor County, the cities of Abilene and Tye, and property owners from the View / Caps Community. An organized communication effort between these communities, Dyess AFB, the public, and other stakeholder entities that own or manage land or resources in the region is needed to ensure that future growth around Dyess AFB is coordinated and compatible / recommended with military operations and training activities to the fullest extent possible while not adversely (or negatively) impacting land use or values in the affected area.
1.1 What Is a Joint Land Use Study?

A JLUS is a planning tool developed through the collaborative efforts of a comprehensive set of stakeholders in a defined study area in order to identify compatibility / recommended land use guidelines within, and adjacent to, active military installations. These stakeholders include local jurisdictions, state, and federal officials, agencies and organizations, property owners, business organizations, local tribal governments, non-governmental organizations, and the military. The public also played a vital role in the development and review of the JLUS.

The intent of the JLUS is to establish and encourage a working relationship among military installations and stakeholders in the area to work as a team to prevent and / or reduce encroachment issues associated with current and future military missions and neighboring community growth. To do this, a JLUS process culminates in an agreed upon set of recommended strategies that can be implemented by identified stakeholders to promote compatibility / recommended land uses and relationships between the military and neighboring communities for the present and future.

This JLUS effort is funded through a grant from the Department of Defense (DOD), Office of Economic Adjustment (OEA). As the administrator of the grant, the City of Abilene supplied a 10 percent match, through the Development Corporation of Abilene, to the OEA funding and provided staff to assist in the administration of the JLUS. While OEA provided the grant funding, the content of the JLUS is produced by and for the local stakeholders. The project management entity for the Dyess AFB JLUS is the City of Abilene.

This JLUS is important to preserve long-term compatibility / recommended land uses between Dyess AFB and the surrounding areas and to better protect the health, safety, and welfare. The JLUS effort will benefit both Dyess AFB and the surrounding region by:

- Protecting the health and safety of proximate residents and workers by preserving long-term land use compatibility / recommended land uses between Dyess AFB and the surrounding communities;
- Promoting comprehensive community planning that addresses compatibility issues by enhancing a cooperative spirit between Dyess AFB and the community; and
- Integrating surrounding local jurisdiction growth policy plans with the installation’s plans.

JLUS Goal

The goal of the Dyess AFB JLUS is to protect the viability of current and future military operations, while simultaneously guiding community growth, sustaining the environmental and economic health of the region, and protecting public health, safety, and welfare of the community around Dyess AFB as much as possible.

JLUS Objectives

To achieve this goal, three JLUS objectives were identified.

- **Understanding.** Convene community and military representatives to identify, confirm, and understand compatibility issues in an open forum, taking into consideration both community and military 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 the military and surrounding communities so that future community growth and development are compatible / recommended with the training and operational missions at Dyess AFB, while seeking ways to reduce operational impacts on adjacent land within the study area.

- **Actions.** Provide a set of mutually supported tools, activities, and procedures from which local jurisdictions, agencies, Dyess AFB, and other stakeholders can select, prepare, and approve / adopt and use to implement appropriate recommendations developed during the JLUS process. The actions 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 potential compatibility issues and prioritize projects within the annual budgeting process.

1.2 Why Prepare a Joint Land Use Study?
Although military installations and nearby communities may be separated by a fenceline, 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 / not recommended development closer to military installations and operational/trainin g areas. The result can initiate new, or expand 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. These issues and their potential impacts can pose a significant threat to military readiness activities and identifying and addressing them is currently one of the military’s greatest operational challenges.

Collaboration and joint planning among military installations, local communities, agencies, and other stakeholders 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 / not recommended uses become 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 economic viability and quality of life within the JLUS Study Area while protecting current and future operations and missions at Dyess AFB.

Regional Economic and Local Importance
Dyess AFB is located in Taylor County in west-central Texas, approximately seven miles southwest of downtown Abilene and just south of the City of Tye. The majority of the base is within the city limits of Abilene, but a small portion on the north end is within the city limits of Tye. Figure 1-1 shows the location of Dyess AFB

Dyess AFB is an important economic engine in the region, contributing more than $400 million in economic benefit to local communities in fiscal year (FY) 2014. Dyess AFB supported 10,255 people in FY 2014, including 5,637 military personnel, 661 civilians, and 5,344 military dependents. Additionally, 3,605 military retirees reside within 50 miles of Dyess AFB.

Military Strategic Importance
Aside from being a significant economic generator for the region, Dyess AFB is a strategic asset for the nation’s defense. The host unit at Dyess AFB is the 7th Bomb Wing. Additionally, the base is home to many important associate units, including The 317th Airlift Wing and Air Force Office of Special Investigations Detachment 222. It is also home to the Air Combat Command (ACC) Training Support Squadron; 29th Training Systems Squadron, Detachment 4; 77th Weapons Squadron; 337th Test and Evaluation Squadron; 436th Training Squadron; and 489th Bomb Group. The 7th Bomb Wing’s mission is to provide overwhelming long-range strike within hours anywhere in the world. It is also charged with producing combat-ready aircrews in the Air Force’s only B-1B formal training unit. Additional details on Dyess AFB’s missions and activities are described in Chapter 3, Military Profile.
Dyess Air Force Base
UV438
UV222
UV206
UV322
UV79
UV283
UV158
UV351
UV158
UV279
UV70
UV6
UV92
UV6
UV206
UV70
UV208
UV36
UV153
UV84
UV84
UV283
UV277
UV183
UV183
UV283
UV277
UV380
UV67
UV180
UV83
UV83
UV87

Legend

Dyess Air Force Base
County
Community Covered by JLUS
Other Community
Interstate
US Highway
Runway / Airfield
Water Body
State Route
Major Road
Railroad


Figure 1-1
Dyess AFB Location Map
1.3 Local Communities Working Together

Dyess AFB contributes to the local community in more ways than its economic benefit. The base interacts with the community through actions both related to and independent of the military. Dyess AFB participates in a variety of community events and activities throughout the year, including special events, parades, and fire department and police support to local jurisdictions. Personnel from Dyess AFB not only live in the surrounding community, but also engage with the community through volunteering. In return, the local community participates in various events throughout the year to show support and appreciation for Dyess AFB and its personnel.

Some of the activities that Dyess AFB and the local community engage in to enhance their cooperative partnership as neighbors and partners are as follows.

- The Abilene Military Affairs Committee donated $350,000 to build the Dyess Memorial Park with the base matching the amount to landscaping, walkways and other beautification. The park is located outside the base at the intersection of Arnold Boulevard and Military Drive.

- The community of Abilene built and donated the Dyess Museum as a gift to Dyess AFB for the Air Force’s 50th birthday in 1997. Inside the facility, which is located outside the Dyess Memorial Park, visitors can view the history of Dyess AFB since its commissioning in the early 1940’s.

- Big Country Air Power, in partnership with Dyess AFB, hosts the Big Country Airfest Open House Airshow in alternating years to split the costs of putting on the airshow. The Airfest opens the base up to the general public and provides static aircraft displays and aerial air shows. Approximately 20,000 people attended the event in May 2015, the first since 2012 due to government sequestration.

- Dyess AFB and the surrounding communities participate in the Air Force Community Partnership Program to help identify and implement mutually beneficial partnerships and initiatives.

- Each year, the 7th Force Support Squadron hosts, with the support of the community, the South Park Holiday Dinner, a charity dinner to feed the less fortunate.

- A Memorandum of Agreement was signed in 2013 stating the Explosive Ordnance Disposal team from the 7th Civil Engineer Squadron would support the Abilene Police Department during operations with explosives both on-base and off-base.
The City of Abilene hosts the Annual Armed Forces Barbeque, which is commonly known as the “World’s Largest Barbeque.” The lunch-and-dinner barbeque is free for all service members currently in the military and their families. It is also opened to spouses of deployed military members and Department of Defense civilian employees.

The Dyess Fire Department works with several local fire departments to help keep them qualified on quarterly and annual training. A Memorandum of Agreement was signed in 2013 outlining the mutual aid in responses to fire prevention and hazardous materials incidents.

Dyess AFB and the City of Abilene share a backup Emergency Operations Center to reduce the costs of each maintain an expensive individual backup system.

1.4 Public and Stakeholder Outreach
As highlighted in the goal and objectives stated previously, the JLUS process is designed to create a locally relevant study 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 provided 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 and involving them early in the project is instrumental in the identification of compatibility issues to address and resolve through the development of integrated strategies. Stakeholders include individuals, groups, organizations, and governmental entities interested in, affected by, or affecting the outcome of the JLUS project. Stakeholders identified for the Dyess AFB JLUS included, but were not limited to:

- Local jurisdictions (Taylor County, City of Abilene, and City of Tye)
- DOD officials and Dyess AFB personnel
- Local, regional, state, and federal planning, regulatory, and resource management agencies
- The public (including property owners, residents, and farmers)
- Other special interest groups

Policy Committee and Technical Advisory Committee
The development of the Dyess AFB JLUS was guided by two committees, composed of representatives from Taylor County, the cities of Abilene and Tye, Property Owners, the Abilene Chamber of Commerce, and Dyess AFB. The two committees were the Policy Committee (PC) and the Technical Advisory Committee (TAC).

JLUS Policy Committee. The PC consisted of elected officials and decision makers from participating jurisdictions, military installation leadership, and representatives from other interested and affected agencies and stakeholders, including Property Owners from the rural areas south and west of Dyess AFB. The PC was responsible for guiding the direction of the JLUS, preparing and approving the study design, approving policy recommendations, and approving the draft and final JLUS documents.

JLUS Technical Advisory Committee. The TAC was responsible for identifying and studying technical issues. Membership included representatives from local jurisdictions, agencies, Property Owners from the rural areas south and west of Dyess AFB, and Dyess AFB with technical expertise in one or more of the compatibility factors discussed in Chapter 5, Compatibility Assessment. The TAC identified and addressed technical issues, provided feedback on report development, and assisted in the development and evaluation of implementation strategies and tools.

The PC and TAC served as liaisons to their respective stakeholder groups. PC and TAC 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 TAC are identified in Tables 1-1, 1-2, and 1-3, respectively.
Table 1-1. JLUS Sponsor Responsibilities and Participants

<table>
<thead>
<tr>
<th>Responsibilities</th>
<th>Participants</th>
</tr>
</thead>
<tbody>
<tr>
<td>Coordination</td>
<td>Office of Economic Adjustment</td>
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<tr>
<td>Accountability</td>
<td>City of Abilene</td>
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<tr>
<td>Grant management</td>
<td></td>
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<tr>
<td>Financial contribution</td>
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</table>

Table 1-2. JLUS PC Responsibilities and Participants

<table>
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<th>Responsibilities</th>
<th>Participants</th>
</tr>
</thead>
<tbody>
<tr>
<td>Policy direction</td>
<td>Citizen stakeholder / property owners</td>
</tr>
<tr>
<td>Study oversight</td>
<td>City of Abilene</td>
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<tr>
<td>Monitoring</td>
<td>City of Tye</td>
</tr>
<tr>
<td>Report adoption</td>
<td>Dyess Air Force Base</td>
</tr>
<tr>
<td></td>
<td>Taylor County</td>
</tr>
</tbody>
</table>

Table 1-3. JLUS TAC Responsibilities and Participants

<table>
<thead>
<tr>
<th>Responsibilities</th>
<th>Participants</th>
</tr>
</thead>
<tbody>
<tr>
<td>Identify issues</td>
<td>Abilene Chamber of Commerce</td>
</tr>
<tr>
<td>Provide expertise to address technical issues</td>
<td>Citizen stakeholder / property owners</td>
</tr>
<tr>
<td>Evaluate and recommend implementation options to the PC</td>
<td>City of Abilene</td>
</tr>
<tr>
<td></td>
<td>City of Tye</td>
</tr>
<tr>
<td></td>
<td>Dyess Air Force Base</td>
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<tr>
<td></td>
<td>Taylor County</td>
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Committee and Public Meetings / Workshops

Committee meetings and public workshops were held throughout the process to ensure the JLUS identified and appropriately addressed local issues.

Committee Meeting #1 (Joint Meeting of the PC and TAC) - April 6, 2016

The project kick-off meeting was held as a joint meeting with both the PC and TAC. The purpose of the project kick-off meeting was to outline the JLUS process and goals, educate all stakeholders about the Dyess AFB JLUS and their roles and responsibilities in the process. Additional topics discussed included the project Study Area, review of issues identified, refinement of the project timeline, review lessons learned from other JLUS projects, and identification of any additional compatibility issues.

Property Owner Workshop - April 7, 2016

This workshop was held as an informational meeting for public stakeholders south of Dyess AFB within the noise contours. The workshop was held to provide information to the citizens on the JLUS process and how noise issues will be assessed during the JLUS process.

Public Workshop #1 – October 3, 2016

The focus of this workshop was to explain the purpose and function of the JLUS, provide an overview of the military operations at Dyess AFB, introduce project participants, share the JLUS approach and discuss the JLUS goals. The format of this meeting included a presentation to the public followed by an open comment period where attendees were encouraged to share their input on potential JLUS issues. A user-friendly JLUS Project Overview was distributed at this workshop to provide the public a tool in completing a compatibility issues exercise. Attendees worked in groups around large scale Study Area maps to complete a compatibility issues worksheet as well as engage in group discussions with the JLUS team. Participants were asked to complete a paper questionnaire that asked questions about different compatibility factors to be considered for the JLUS.

The questionnaire was also posted on the project website so that those unable to attend the workshop were able to respond to the questions and provide input. The questionnaire was available on the website for 30 days. After this time, the results from the website were combined with the results from the meeting and posted on the website.

TAC Meeting #2 – October 4, 2016

The set of second committee meetings served three primary functions. First, committee members were given an overview of the JLUS Background Report that was being developed and a summary of what each chapter addresses. Secondly, a discussion of the military footprints and a map showing the extent of each was presented. Lastly, each compatibility issue identified to date was assessed, prioritized, and refined.
as necessary to ensure it appropriately captured the context of the concern.

**TAC Meeting #3 – March 2, 2017**
The focus of this TAC meeting was to discuss committee comments on the Background Report and how to address the comments to get a more concise discussion of the issues that affect the stakeholders.

**TAC Meeting #4 – March 7, 2017 / PC Meeting #3 – March 8, 2017**
This set of committee meetings included an overview of the public workshop held on March 6, 2017, an update on the JLUS project since the previous meeting, and discussion of preliminary recommendations to address the compatibility issues.

**Public Workshop #2 – March 6, 2017**
The second public workshop started with a recap of the JLUS process and an overview of what has occurred since the previous public workshop. The two key pieces of information that were presented to attendees were the Dyess AFB mission profile footprints (the locations where mission operations affect land outside the installation boundaries, e.g., noise zones and airfield safety zones), and a summary of the compatibility issues that have been identified during the JLUS process. Issues were identified through input from project stakeholders, the JLUS committees, the public, and technical expertise. The primary outcome of the workshop was to get the public’s input on how important each compatibility issue is to them. Following the presentation, attendees were asked to rank the importance of each issue to them through an interactive exercise. A series of posters were put up on the walls that contained each issue. Attendees were asked to rank each issue as either very important, important, somewhat important, not important, no opinion, or not an issue. The results of this activity can be found in Appendix A at the end of the JLUS Background Report.

**TAC Meeting #5 – April 27, 2017**
Throughout the development of the JLUS Background Report, committee members provided comments on the various chapters and topics that were most important to them. This workshop served as a working session for TAC members to discuss the revisions to the document that were made based on their comments to make sure they were captured correctly in preparation of the Final Background Report. Some discussion on recommendations for the Implementation Plan in the JLUS Report also occurred.

**TAC Meeting #6 – September 5, 2017**
**PC Meeting #4 – September 6, 2017**
This set of committee meetings was held to discuss committee comments on the draft recommendations and refine them as appropriate to prepare the Public Draft JLUS Report.

**Public Workshop #3 – October 18, 2017**
The third and final public workshop was held during the Public Draft review and comment period. Attendees of the workshop were given a brief summary of the JLUS process and were provided with a breakdown of the JLUS Report and how the compatibility issues were addressed. A focus of the meeting was the JLUS Implementation Plan (Chapter 6 of the JLUS Report), how the strategies were developed, and how to read the strategies. The process for submitting comments on the draft was explained and all attendees were encouraged to review the documents and provide any comments or concerns they have.

**TAC Meeting #7 – November 27, 2017**
**PC Meeting #5 – November 28, 2017**
This last set of meetings was held to present the Final JLUS Report. The Final JLUS Report was prepared with all of the comments and revisions as outlined in the previous tasks and as deemed appropriate to incorporate by the PC. The presentation of the Final JLUS Report discussed the overall findings, major changes and revisions to the report that were incorporated based on comments received from the committee members and the public.

**Public Outreach Materials**
Various public outreach activities were conducted throughout the JLUS process to keep the public engaged in the process and get their input on any issues or concerns that should be addressed in the JLUS. Along with the public workshops that were held, informational materials (fact sheets and brochures) were developed and handed out at the workshops. A project website was also maintained through the duration of the project.
Introduction

**JLUS Overview Fact Sheet**

At the beginning of the JLUS project, a JLUS Overview Fact Sheet was developed that describes the JLUS program, objectives, methods for the public to provide input into the process, an overview of the 24 compatibility factors that were analyzed throughout the project, and the Dyess AFB JLUS Study Area. This Fact Sheet was made available at the public workshops and posted on the project website for download.

**Strategy Tools Brochure**

The Strategy Tools Brochure was prepared for the second public workshop. JLUS strategies constitute a variety of actions that local governments, military installations, agencies, and other stakeholders can take to promote compatible / recommended land use planning. This brochure provides an overview of the strategy types that could be applied to address compatibility issues around Dyess 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 project points of contact, schedules, a link to join the list to receive email updates, documents, maps, public meeting information, and a link to submit comments. The project website was www.dyessjlus.com.

1.5 JLUS Study Area

The Dyess AFB JLUS Study Area is designed to address all lands near Dyess AFB that may impact current or future military operations or be impacted by operations. Located within Taylor County, the surrounding communities’ land uses include a variety of residential, commercial, industrial, and agricultural uses. The primary characteristics evaluated in determining the JLUS Study Area were general compatibility factors associated with military mission readiness and land uses that may impact or be impacted by military operations. Figure 1-3 illustrates the Study Area.
Dyess Air Force Base
Taylor County
Jones County

£¤ 277
£¤ 84
£¤ 80
¬« 36
¬« 322
¬« 351

Hawley
Elm Creek
Mulberry Creek
Lytle Creek
Buck Creek
Cedar Creek
Bull Wagon Creek
Indian Creek
Little Elm Creek
Bitter Creek
Horse Fall Creek
Buttonwillow Creek
Cat Claw Creek
Fort Phantom Hill Lake
Kirby Lake
Lytle Lake
R J Griffith Lake
Sayles Lake
Tye
Abilene

Impact

Source: Dyess AFB 2013 AICUZ.

Figure 1-2

Dyess Air Force Base

Legend

Interstate
Highway
Local Road
Railroad
Runway / Airfield
Water Body
Stream / River

JLUS Study Area

0 1 2 Miles

Page 1-10
Background Report
1.6 JLUS Organization
The following is a brief overview of the organization of the three Dyess AFB JLUS documents: the Background Report, JLUS Report, and the Executive Summary Brochure.

Background Report

Chapter 1: Introduction
Chapter 1 provides an introduction and overview of the Dyess AFB JLUS. This chapter describes the strategic and local importance of Dyess AFB, the working relationships among base and local communities, the background and intent of the JLUS, the JLUS 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 local jurisdictions that are within the JLUS Study Area and gives an overview of their history and current statistics, including population, housing characteristics, economic outlook, and trends of growth and development. The chapter also discusses an overview of the transportation system within the JLUS Study Area.

Chapter 3: Dyess AFB Profile
The Dyess AFB Profile chapter provides an overview of Dyess AFB as well as the military operations that take place on-base and in the surrounding area. The discussion of Dyess AFB also includes information on the units 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 JLUS Study Area to get an idea of how the military operations could potentially impact, or be impacted by, the surrounding communities. For this reason, Chapter 3 includes a discussion and associated maps describing the military footprint of Dyess AFB.

Chapter 4: Existing Compatibility Tools
This chapter provides an overview of relevant plans, programs, and studies that are tools that are, or could be, used to address compatibility issues in the JLUS Study Area. The applicable tools are reviewed to assess the effectiveness of each existing plan or program relative to addressing the compatibility issues that are identified and described in Chapter 5.

Chapter 5: Compatibility Assessment
Compatibility, in relation to military readiness, can be defined as the balance or compromise between community needs and interests and military needs and interests. This chapter presents the compatibility issues identified for the Dyess AFB JLUS. These issues were identified based on input from the PC and TAC, members of the public, stakeholder interviews, existing plans and technical reports, and evaluation by the project team. This chapter categorizes the issues into the following 24 compatibility factors:

- Air Quality (Section 5.2)
- Anti-Terrorism / Force Protection (Section 5.3)
- Biological Resources (Section 5.4)
- Communication / Coordination (Section 5.5)
- Cultural Resources (Section 5.6)
- Dust / Smoke / Steam (Section 5.7)
- Energy Development (Section 5.8)
- Frequency Spectrum Capacity (Section 5.9)
- Frequency Spectrum Impedance / Interference (Section 5.10)
- Housing Availability (Section 5.11)
- Infrastructure Extensions (Section 5.12)
- Land / Air / Sea Space Competition (Section 5.13)
- Land Use (Section 5.14)
- Legislative Initiatives (Section 5.15)
- Light and Glare (Section 5.16)
- Marine Environments (Section 5.17)
- Noise (Section 5.18)
- Public Trespassing (Section 5.19)
- Roadway Capacity (Section 5.20)
- Safety (Section 5.21)
- Scarce Natural Resources (Section 5.22)
- Vertical obstructions (Section 5.23)
- Vibration (Section 5.24)
- Water Quality / Quantity (Section 5.25)
**JLUS Report**

The JLUS Report presents an overview of the JLUS planning process, purpose and objectives of the study and the recommended Implementation Plan. The report presents a concise description of the following:

- JLUS project study area, including Dyess AFB mission overviews;
- Population profile and economic overview of the JLUS Study Area and jurisdictions;
- Summary of the factors and compatibility issues identified during the JLUS process; and
- Set of recommended strategies to mitigate or prevent encroachment and proactively achieve compatibility / recommended land uses.

**JLUS Executive Summary Brochure**

The JLUS Executive Summary brochure is a graphical brochure that provides a brief overview of the JLUS project and process and highlights the major compatibility issues and recommended strategies to address them. It also includes Dyess AFB Influence Area maps and descriptions of each area.
Inside Section 2 ...

2.1 Overview of JLUS Communities .......................... 2-2
2.2 JLUS Community Growth Trends ......................... 2-4
2.3 Housing Trends .............................................. 2-7
2.4 Economic Baseline .......................................... 2-9
2.5 Current Development Overview within the Study Area .................................................. 2-13
2.6 Transportation ............................................... 2-13

This chapter provides important information about the civilian entities within the Dyess Air Force Base (AFB) Joint Land Use Study (JLUS) Study Area. The Study Area for this JLUS includes Dyess AFB and the surrounding communities of the City of Abilene, City of Tye, and Taylor County. The Study Area is discussed and shown on maps in Chapter 1, Introduction.

Understanding the socio-economic characteristics of the surrounding JLUS communities is essential to providing a baseline context from which informed decisions can be made when developing compatibility strategies. The purpose of this chapter is to provide information that will enable stakeholders to understand population and development trends that have the potential to affect the future of Dyess AFB. This information, combined with the other factors presented is intended to help decision-makers develop consistent, informed planning policies about future development and economic growth, before compatibility issues arise.

This chapter is also designed to enhance the Base’s understanding of the types of activities occurring “outside the fence” so that, military leadership can apply those insights when considering future missions and operations.
2.1 Overview of JLUS Communities

History and Profile

Taylor County

The Comanche of the Penateka band were the original inhabitants of the region since the eighteenth century. In 1858 the Texas legislature established Taylor County from lands formerly assigned to Bexar and Travis counties. However, due to the presence of the Native Americans in the area, it remained largely unsettled until the 1870s. A small settlement, Buffalo Gap, organized in 1878 with ranching driving the local economy. Settlement accelerated when the Texas and Pacific Railway built through the northern part of the county, bypassing Buffalo Gap, in the early 1880s. The Town of Abilene was established in 1881, which developed into a shipping center around the railroad. In the 1890s, crop farming began to expand with the cultivation of peaches, corn, wheat, and cotton.

During the first years of the twentieth century, hundreds of farmers moved into the area, primarily because of the rapid expansion of cotton cultivation. By the time the Santa Fe Railroad reached Taylor County in 1910, Abilene had established itself as the largest town in the county. The growth of the agricultural economy was reversed during the 1910s because of extended droughts. Taylor County grew slightly during the 1920s, but the Great Depression of the 1930s hurt many cotton farmers and ranchers. While cotton production continued to decline in the years after World War II, the economy shifted significantly and became more diversified. Oil had been discovered in the county in 1929 but first became an important part of the local economy during the early 1940s. Ranchers also began diversifying their stock, raising more pigs, sheep, and poultry.

World War II transformed Abilene, with the acquisition of Camp Barkeley, an Army post, in 1940 and the Abilene Army Air Base in 1942 (renamed to Abilene Army Airfield in 1943) that opened up new opportunities for the local economy for defense spending and investment. After World War II civic leaders sought an air force base to maintain the flow of federal dollars, and Congress approved the establishment of Dyess AFB in 1952.

Taylor County took steps in the 1960s and 1970s to encourage industrialization and by 1985 there were 145 industrial plants, employing 5,800 workers. Industries included meat packing, soft-drink bottling, and the manufacture of men's clothing, plumbing fittings, watches, clocks, and aircraft equipment. In the 1980s, 89 percent of the county's land was in farms and ranches, an industry that continues to support the local economy today. Dyess AFB also remains an important economic provider to the County. In 2005, the first wind farms in Taylor County – Horse Hollow Wind Energy Center and Callahan Divide Wind Energy Center – became operational. These two sites have expanded since then, and additional wind farms have been developed in the neighboring counties as well.

Taylor County is located in the Rolling Plains vegetation region of west central Texas. The county covers 917 square miles of prairie covered by grasses, with some mesquite and live oak trees. The county is bordered by Jones County to the north, Shackelford County to the northeast, Callahan County to the east, Coleman County to the southeast, Runnels County to the south, Nolan County to the west, and Mitchell County to the northwest. The county had a 2010 population of 131,506. US Highway 83/84 and 227, Interstate 20, and State Highway 36 traverse the county.

Under the Texas Constitution, county governments are functional agents of the state and limited in their actions. Taylor County provides support of public safety and jails, support for the court system, record-keeping for deeds and public documents, operating elections and certain environmental, health and human services. The county has four precinct commissioners and a county judge that serve on the Taylor County Commissioners Court.

Source: https://tshaonline.org/handbook/online/articles/hct02
City of Abilene

Before the coming of the railroad, the Abilene area had been sporadically inhabited by nomadic Indians and United States military personnel and later by buffalo hunters and ranchers. After the Texas and Pacific Railroad arrived at the site in January 1881, the railroad promoted Abilene as the “Future Great City of West Texas.” In January 1883, residents voted to incorporate and in October 1883 Abilene became the county seat.

The lack of water in the city limited agriculture and economic development. However, the city excavated four lakes from 1897 to 1937 to ensure a municipal water supply. The city began holding fairs in 1884 to promote the region’s agricultural products. Drought and the decline of farm prices slowed growth in the 1920s and 1930s.

The city attracted educational institutions to the region, with the opening of Simmons College (now Hardin-Simmons University) in 1891. Abilene Christian College (now Abilene Christian University) first opened as Childers Classical Institute in 1906 and McMurry College (now McMurry University) opened in 1923.

In about 100 years Abilene developed from an almost entirely agricultural economy to a diversified economy based on oil, agriculture, commerce, light manufacturing, and service. World War II and the development of Dyess AFB were the largest boosts to the city’s growth and economy. The oil industry, including the development of exploration, drilling, refining, and oilfield service industries, expanded significantly after World War II.

In 1959 Abilene made extensive improvements to the downtown area. But major population movement in the 1970s and 1980s, spurred by the location of Cooper High School, the Mall of Abilene, and Fairway Oaks, was south toward Buffalo Gap.

Abilene is in the northeast corner of Taylor County and covers 110 square miles. The 2010 population was 117,063. The city is connected east-west by Interstate Highway 20, US Highway 80, and State Highway 36 and north-south by US highways 83, 84, and 277. The city operates under a city-manager form of government with a mayor and six city council members.

Source: https://tshaonline.org/handbook/online/articles/hda01

City of Tye

The City of Tye was originally named Tebo and established nearby the Texas and Pacific Railway in 1881. A church, community school, and post office were established from 1892 to 1899. In 1901 the name of the post office and community was changed to Tye, to honor John P. Tye, who served as the first postmaster and as a Methodist minister.

The population grew from an estimated 40 residents in 1925 to 100 in 1940, when the community had five businesses, four churches, the Tye School and a number of dwellings. During World War II, Abilene Army Air Base (shortly after renamed to Abilene Army Airfield) was built just south of the community for the Army Air Corps. In 1953 work began to restore and enlarge the field and it was reactivated as Abilene Air Base.
Force Base in 1956. Later that year the base was renamed Dyess AFB. As the base and nearby Abilene grew in the 1950s, Tye also continued to expand. It incorporated in the mid-1950s and its population grew to 521 in 1960, 857 in 1970 and 1,088 in 1990. In the 1980s trucking and oil were among the more important sectors of the local economy. In 2000 the community had a population of 1,158 and listed fifty-five businesses.

The City of Tye is located eight miles west of downtown Abilene and just north of Dyess AFB in northern Taylor County. The city encompasses 4.7 square miles and had a 2010 population of 1,242.

Source: https://tshaonline.org/handbook/online/articles/hjt13

2.2 JLUS Community Growth Trends
The following section provides a profile of the Study Area’s population growth, housing trends, and median home values. This information assists in setting the regional context and growth potential for the JLUS Study Area.

Population
Population numbers are based on data provided by the US Census and show the growth or decline in people in a geographical area. Population is a major factor for the economy of the Study Area and ultimately supports the employment and housing opportunities. The following information provides a comparison of the changes in population for the Dyess AFB JLUS Communities from 2010 to 2015.

The population figures represent the permanent population in the Study Area, including full-time resident university students, but do not consider the temporary population surges associated with the tourism industry and migration from seasonal employment. Table 2-1 shows the 2010 census totals, 2015 census estimates, and percent change in populations of jurisdictions within the JLUS Study Area.

<table>
<thead>
<tr>
<th>Jurisdiction</th>
<th>2010</th>
<th>2015 (estimate)</th>
<th>Percent Change</th>
</tr>
</thead>
<tbody>
<tr>
<td>Texas</td>
<td>25,145,561</td>
<td>27,469,114</td>
<td>9.2%</td>
</tr>
<tr>
<td>Taylor County</td>
<td>131,506</td>
<td>136,051</td>
<td>3.5%</td>
</tr>
<tr>
<td>City of Abilene</td>
<td>117,063</td>
<td>121,721</td>
<td>4.0%</td>
</tr>
<tr>
<td>City of Tye</td>
<td>1,242</td>
<td>1,260</td>
<td>1.4%</td>
</tr>
</tbody>
</table>


Compared to the Texas population growth, the Study Area had a smaller change in population. While most population growth in Texas occurred in major cities, the Study Area still saw an increase in their population levels. Population growth can be an indication of available housing or job opportunities. The area’s high quality of life, low cost of living, pro-business environment, and provision of public services has helped to drive this slight population increase.

Figure 2-1 illustrates the population densities in the JLUS Study Area in 2000 and Figure 2-2 shows the change in densities in 2010. These figures are both presented to show the growth and density of areas within the JLUS Study Area. The data used to develop these maps is taken from the US Census Bureau and is aggregated by Census blocks. Therefore, actual population densities and associated number of houses and other residential units in some of the locations may be lower or higher than shown in the aggregated Census block boundary. This information is included to provide a generalized baseline of the population growth in the Study Area to show areas around Dyess AFB that have experienced general growth or decline from 2000 to 2010.
Figure 2-1
JLUS Study Area Population Density, 2000

Legend
Population Per Sq. Mile
- 25
26 - 100
101 - 500
501 - 1000
1001 - 5000
5001+

Dyess Air Force Base
County
Tye
Abilene
Tye Extraterritorial Jurisdiction
Abilene Extraterritorial Jurisdiction
Other Community

Note: The data used to develop this map is taken from the US Census Bureau and is aggregated by Census blocks. Actual population densities in some locations may be lower or higher than shown in the aggregated Census block boundary. Source: US Census, 2000.
Note: The data used to develop this map is taken from the US Census Bureau and is aggregated by Census blocks. Actual population densities in some locations may be lower or higher than shown in the aggregated Census block boundary. Source: US Census, 2010.
Future Population Projections

Population projections for Texas communities are prepared by the Texas Water Development Board. Table 2-2 shows the population projections for the JLUS communities. Taylor County and the cities of Abilene and Tye are expected to see about a 19 percent change in population from 2010 to 2050. This rate of change is less than the state, yet there is still an expected steady increase in population for the area.

These projected populations are exact; they are estimated to help cities and counties to develop land use priorities to minimize impacts from future growth and manage new development.

<table>
<thead>
<tr>
<th>Location</th>
<th>2010</th>
<th>2020</th>
<th>2030</th>
<th>2040</th>
<th>2050</th>
<th>Percent Change 2010-2050</th>
</tr>
</thead>
<tbody>
<tr>
<td>Texas</td>
<td>25,145,561</td>
<td>29,510,184</td>
<td>33,628,653</td>
<td>37,736,338</td>
<td>41,928,264</td>
<td>66.7%</td>
</tr>
<tr>
<td>Taylor County</td>
<td>131,506</td>
<td>140,675</td>
<td>147,183</td>
<td>152,561</td>
<td>156,822</td>
<td>19.3%</td>
</tr>
<tr>
<td>City of Abilene</td>
<td>117,063</td>
<td>125,179</td>
<td>131,036</td>
<td>135,837</td>
<td>139,656</td>
<td>19.3%</td>
</tr>
<tr>
<td>City of Tye</td>
<td>1,242</td>
<td>1,329</td>
<td>1,391</td>
<td>1,441</td>
<td>1,482</td>
<td>19.3%</td>
</tr>
</tbody>
</table>

Source: US Census Bureau, 2010; Texas Water Development Board

2.3 Housing Trends

Housing trends indicate economic activity and vitality in an area through the representation of population growth. In slower-growing areas, housing data may reveal population decline or out-migration. These trends also represent market decisions relating to home ownership or rental properties. The rate of housing development is a strong indicator of the overall rate of development taking place in a region, which may result in potential incompatible / not recommended land uses in conjunction with operations at Dyess AFB. Essentially, housing trends have the potential to indicate future types of residential and commercial development. The following information portrays housing market trends, median monthly gross rents, percentage of basic allowance for housing (BAH) and median home values within the JLUS Study Area.

Table 2-3 shows an increase in housing units between 2000 and 2015 in Taylor County and the City of Abilene, while the City of Tye experienced a decrease in housing units. The increase in attractiveness of the area is causing increases in both population and new housing development.

<table>
<thead>
<tr>
<th>Jurisdiction</th>
<th>2000</th>
<th>2015 (estimate)</th>
<th>Percent Change</th>
</tr>
</thead>
<tbody>
<tr>
<td>Texas</td>
<td>8,157,575</td>
<td>10,305,607</td>
<td>26.3%</td>
</tr>
<tr>
<td>Taylor County</td>
<td>52,056</td>
<td>56,492</td>
<td>8.5%</td>
</tr>
<tr>
<td>City of Abilene</td>
<td>45,618</td>
<td>48,240</td>
<td>5.7%</td>
</tr>
<tr>
<td>City of Tye</td>
<td>582</td>
<td>524</td>
<td>-10.0%</td>
</tr>
</tbody>
</table>

Sources: US Census Bureau, 2000; 2011-2015 American Community Survey 5-Year Estimates

An increasing number of potential renters leads to a higher demand for rental units. A demand-driven rise in rent costs affects both the local economy and housing market. Understanding trends in rent costs can account for housing trends.

Table 2-4 shows the change in median monthly rents for communities in the JLUS Study Area from 2000 to 2015. During this timeframe, the median monthly rent increased by a range of roughly 49 to 65 percent among the JLUS communities. In the 15-year span, Taylor County and City of Abilene experienced the greatest increase in median monthly rent, with a
between 64 to 65 percent increase, which was a larger percent increase in rent compared to the entire state. However, the 2015 median monthly rents for Taylor County and Abilene were lower in when compared to the state. Tye’s rental rate increased as well, but at a slightly lower percentage than the state.

Table 2-4. JLUS Study Area Median Gross Monthly Rents, 2000-2015

<table>
<thead>
<tr>
<th>Jurisdiction</th>
<th>2000</th>
<th>2015 (estimate)</th>
<th>Percent Change</th>
</tr>
</thead>
<tbody>
<tr>
<td>Texas</td>
<td>$574</td>
<td>$882</td>
<td>53.7%</td>
</tr>
<tr>
<td>Taylor County</td>
<td>$472</td>
<td>$778</td>
<td>64.8%</td>
</tr>
<tr>
<td>City of Abilene</td>
<td>$474</td>
<td>$778</td>
<td>64.1%</td>
</tr>
<tr>
<td>City of Tye</td>
<td>$471</td>
<td>$701</td>
<td>48.8%</td>
</tr>
</tbody>
</table>


Housing Value Trends

Housing value trends assist in illustrating the changes in land and home values relative to market fluctuations. These fluctuations can be indicative of development activity or inactivity as well as the location or migration patterns of populations. Table 2-5 provides the median housing value trends in the JLUS communities from 2000 to 2015.

Table 2-5. JLUS Study Area Median Housing Value, 2000-2014

<table>
<thead>
<tr>
<th>Jurisdiction</th>
<th>2000</th>
<th>2015 (estimate)</th>
<th>Percent Change</th>
</tr>
</thead>
<tbody>
<tr>
<td>Texas</td>
<td>$82,500</td>
<td>$136,000</td>
<td>64.8%</td>
</tr>
<tr>
<td>Taylor County</td>
<td>$61,700</td>
<td>$101,500</td>
<td>64.5%</td>
</tr>
<tr>
<td>City of Abilene</td>
<td>$61,100</td>
<td>$97,300</td>
<td>59.2%</td>
</tr>
<tr>
<td>City of Tye</td>
<td>$29,000</td>
<td>$46,100</td>
<td>59.0%</td>
</tr>
</tbody>
</table>


Median housing values have experienced substantial growth throughout the JLUS Study Area, but the JLUS communities were still below the values of the state as a whole. These increasing values translate into higher rents and mortgages as well as an increase in the cost of living for area residents. Greater housing values cause a challenge to the affordability of housing near Dyess AFB.

Military Housing

The BAH is a stipend given to military personnel who choose to live off-base or cannot be accommodated in on-base housing, and is designed to augment the costs of living associated with private sector housing including home or apartment rent, utilities, and renter’s insurance. Table 2-6 shows the 2016 Dyess AFB BAH rates.

Taylor County has a 2014 Median Rental Rate of $777. The BAH for a grade E-4 with dependents is $294 more than the median rent. When comparing current BAH rates to median rental prices around Dyess AFB, it is evident that affordability is not an immediate concern for personnel stationed at the installation.

Table 2-6. Dyess AFB BAH for Military Personnel 2016

<table>
<thead>
<tr>
<th>Grade</th>
<th>With Dependents</th>
<th>Without Dependents</th>
</tr>
</thead>
<tbody>
<tr>
<td>E-1</td>
<td>$1071</td>
<td>$804</td>
</tr>
<tr>
<td>E-2</td>
<td>$1071</td>
<td>$804</td>
</tr>
<tr>
<td>E-3</td>
<td>$1071</td>
<td>$804</td>
</tr>
<tr>
<td>E-4</td>
<td>$1071</td>
<td>$804</td>
</tr>
<tr>
<td>E-5</td>
<td>$1146</td>
<td>$924</td>
</tr>
<tr>
<td>E-6</td>
<td>$1281</td>
<td>$1002</td>
</tr>
<tr>
<td>E-7</td>
<td>$1392</td>
<td>$1074</td>
</tr>
<tr>
<td>E-8</td>
<td>$1512</td>
<td>$1176</td>
</tr>
<tr>
<td>E-9</td>
<td>$1647</td>
<td>$1236</td>
</tr>
<tr>
<td>W-1</td>
<td>$1284</td>
<td>$1044</td>
</tr>
<tr>
<td>W-2</td>
<td>$1443</td>
<td>$1173</td>
</tr>
<tr>
<td>W-3</td>
<td>$1590</td>
<td>$1239</td>
</tr>
<tr>
<td>W-4</td>
<td>$1668</td>
<td>$1305</td>
</tr>
<tr>
<td>W-5</td>
<td>$1761</td>
<td>$1419</td>
</tr>
<tr>
<td>O-1E</td>
<td>$1416</td>
<td>$1146</td>
</tr>
<tr>
<td>O-2E</td>
<td>$1569</td>
<td>$1206</td>
</tr>
<tr>
<td>O-3E</td>
<td>$1683</td>
<td>$1278</td>
</tr>
<tr>
<td>O-1</td>
<td>$1164</td>
<td>$996</td>
</tr>
<tr>
<td>O-2</td>
<td>$1278</td>
<td>$1122</td>
</tr>
</tbody>
</table>
2.4 Economic Baseline

A contributing economic activity throughout the Study Area is centered on the agriculture and oil industries. Efforts to diversify Taylor County’s economy with new sectors have brought new growth to the county. North of Dyess AFB, the City of Tye has experienced commercial growth along Interstate 20. South of Dyess AFB, the Petrosmith facility has expanded operations and provides some economic stimulus. A cattle feedlot southwest of Dyess AFB in the View / Caps area has moved out, which has generated some interest in new development now that the odors associated with the feedlot are no longer an issue. Outside of these areas, there has been little growth in the unincorporated county around the base.

With an employee base of nearly 5,000 and an economic impact of $433 million in fiscal year 2014, Dyess AFB is the largest single employer in the Abilene Metropolitan Area. However, there are other industries that provide a greater economic impact to the region. According to the 2015 gross domestic product for the Abilene Metropolitan Area, prepared by the US Bureau of Economic Analysis, the industries of Government and Trade were the highest grossing industries, with $1.343 billion and $972 million, respectively. This data does not include oil, gas, or agricultural, but according to data from Develop Abilene – Abilene Industrial Foundation, oil and gas accounted for $1.22 billion in 2012, agriculture crops accounted for $472 million in 2013 and agriculture livestock accounted for $539 in 2013. Figure 2-3 provides a breakdown of the gross domestic product and economic impact of other industries in the Abilene Metropolitan Area.

### Texas

The economy of Texas is one of the largest economies in the US and has a gross state product of $1.64 trillion, the second highest in the US. Historically, four major business enterprises - cattle and bison, cotton, timber, and oil - shaped Texas’s economy prior to World War II. Texas remained largely rural until World War II though the success of the petroleum industry rapidly expanded the economy with heavy industry of many types taking root. The war created tremendous demand for petroleum and a variety of products that Texas was in a unique position to provide. By the end of the war, Texas was one of the leading industrial states and the population had become predominantly urban. Additionally, the economy had diversified sufficiently that, though petroleum was still the largest sector by the end of the war, the business community in the state was truly diverse. The Texas economy today relies largely on information technology, oil and natural gas, aerospace, defense, biomedical research, fuel processing, electric power, agriculture, and manufacturing.

### Taylor County

The North American Industry Classification System (NAICS) is a tool used by businesses and governments in the US, Canada, and Mexico to classify and measure economic activity. NAICS provides a six-digit code classification to identify what business sector a specific business is in and is used to collect, analyze, and publish statistical data related to the US economy. NAICS provides a good indication of the types of business industry in an area, but does typically does not account for government jobs, such as those at Dyess AFB. According to NAICS, the major industries in Taylor County are education, healthcare, social assistance, and retail. Table 2-7 shows the total jobs per industry sector in Taylor County.

<table>
<thead>
<tr>
<th>Grade</th>
<th>With Dependents</th>
<th>Without Dependents</th>
</tr>
</thead>
<tbody>
<tr>
<td>O-3</td>
<td>$1584</td>
<td>$1242</td>
</tr>
<tr>
<td>O-4</td>
<td>$1794</td>
<td>$1398</td>
</tr>
<tr>
<td>O-5</td>
<td>$1944</td>
<td>$1467</td>
</tr>
<tr>
<td>O-6</td>
<td>$1962</td>
<td>$1584</td>
</tr>
<tr>
<td>O-7</td>
<td>$1777</td>
<td>$1107</td>
</tr>
</tbody>
</table>

**Source:** [http://dyesshousing.com/bah.php](http://dyesshousing.com/bah.php)
Figure 2-3  Gross Domestic Product and Economic Impact by Industry in the Abilene Metropolitan Area

Source: Agriculture, oil, and gas data is from Develop Abilene – Abilene Industrial Foundation, 2017; all other data is from the US Bureau of Economic Analysis, 2015

Note: * Government includes the executive, legislative, judicial, administrative, and regulatory activities of federal, state, local, and international governments.
Table 2-7. Taylor County Jobs Per NAICS Business Industry Sector, 2012

<table>
<thead>
<tr>
<th>Industry</th>
<th>Estimate</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Agriculture, Forestry, Fishing and Hunting, and Mining</td>
<td>1,511</td>
<td>2.6%</td>
</tr>
<tr>
<td>Construction</td>
<td>3,668</td>
<td>6.3%</td>
</tr>
<tr>
<td>Manufacturing</td>
<td>3,266</td>
<td>5.6%</td>
</tr>
<tr>
<td>Wholesale Trade</td>
<td>1,407</td>
<td>2.4%</td>
</tr>
<tr>
<td>Retail Trade</td>
<td>7,178</td>
<td>12.4%</td>
</tr>
<tr>
<td>Transportation and warehousing, and utilities</td>
<td>2,866</td>
<td>4.9%</td>
</tr>
<tr>
<td>Information</td>
<td>1,271</td>
<td>2.2%</td>
</tr>
<tr>
<td>Finance and insurance, and real estate and rental and leasing</td>
<td>3,586</td>
<td>6.2%</td>
</tr>
<tr>
<td>Professional, scientific, and management, and administrative and waste management services</td>
<td>4,295</td>
<td>7.4%</td>
</tr>
<tr>
<td>Educational services, and health care and social assistance</td>
<td>16,880</td>
<td>29.1%</td>
</tr>
<tr>
<td>Arts, entertainment, and recreation, and accommodation and food services</td>
<td>5,067</td>
<td>8.7%</td>
</tr>
<tr>
<td>Other services, except public administration</td>
<td>3,652</td>
<td>6.3%</td>
</tr>
<tr>
<td>Public administration</td>
<td>3,397</td>
<td>5.9%</td>
</tr>
</tbody>
</table>

Source: US Census Bureau, American Community Survey, Selected Economic Characteristics, 2010-2012

City of Abilene

In the 1980’s oil prices and consequently oil production fell substantially throughout Texas and other parts of the United States. This downturn in the oil industry had a strong, negative impact on the economy in and around the City of Abilene.

In response to the downturn in the economy, the community worked to diversify and establish a workforce able to withstand future economic difficulties. Diversification of the local economy is the key to attaining a safeguard against negative economic impacts, and the City of Abilene has evolved to support an array of economic activities. This effort has paid off in numerous ways. For example, the city has succeeded in attracting a large variety of manufacturing-related jobs to the area.

Abilene has established itself as a regional center for high quality health care. Hendrick Health System and Abilene Regional Medical Center are both top employers in the area, and are well-respected medical institutions. Dyess Air Force Base provides the City of Abilene a strong connection to Federal employment opportunities. A strong, positive relationship exists between the base and the city, which has provided additional economic stability to the area. With jobs provided by local and state government agencies, along with employment and activity created by Hardin-Simmons University, McMurry University, and Abilene Christian University, the City of Abilene finds itself in a better economic situation today than many cities in West Texas.

Table 2-8 shows the total jobs per business industry sector in the City of Abilene, according to NAICS. The primary business industries in the city are education, healthcare, social assistance, and retail.

- Coca-Cola Bottling Company
- Fehr Foods Incorporated
- Martin Sprocket & Gear
- Peerless Manufacturing
- Pepsi Beverage Company
- Rockwell Collins Incorporated
- Tige Boats Incorporated
- Zoltek Corporation

Abilene Lumber
Table 2-8. City of Abilene Jobs Per NAICS Business Industry Sector, 2012

<table>
<thead>
<tr>
<th>Industry</th>
<th>Estimate</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Agriculture, Forestry, Fishing and Hunting, and Mining</td>
<td>1,031</td>
<td>2.0%</td>
</tr>
<tr>
<td>Construction</td>
<td>3,283</td>
<td>6.5%</td>
</tr>
<tr>
<td>Manufacturing</td>
<td>2,960</td>
<td>5.8%</td>
</tr>
<tr>
<td>Wholesale Trade</td>
<td>1,059</td>
<td>2.1%</td>
</tr>
<tr>
<td>Retail Trade</td>
<td>6,326</td>
<td>12.5%</td>
</tr>
<tr>
<td>Transportation and warehousing, and utilities</td>
<td>2,337</td>
<td>4.6%</td>
</tr>
<tr>
<td>Information</td>
<td>1,039</td>
<td>2.0%</td>
</tr>
<tr>
<td>Finance and insurance, and real estate and rental and leasing</td>
<td>3,226</td>
<td>6.3%</td>
</tr>
<tr>
<td>Professional, scientific, and management, and administrative and waste management services</td>
<td>3,726</td>
<td>7.3%</td>
</tr>
<tr>
<td>Educational services, and health care and social assistance</td>
<td>15,044</td>
<td>29.6%</td>
</tr>
<tr>
<td>Arts, entertainment, and recreation, and accommodation and food services</td>
<td>4,636</td>
<td>9.1%</td>
</tr>
<tr>
<td>Other services, except public administration</td>
<td>3,336</td>
<td>6.6%</td>
</tr>
<tr>
<td>Public administration</td>
<td>2,808</td>
<td>5.5%</td>
</tr>
</tbody>
</table>

Source: US Census Bureau, American Community Survey, Selected Economic Characteristics, 2010-2012

City of Abilene

Although the City of Abilene remains an active hub of Taylor County. Table 2-9 shows the total jobs per NAICS business industry sector in the City of Abilene, as of 2012. The primary industries in the City of Abilene are construction, health care and social assistance, and retail trade, but the Tye Elementary School closed in 2013, which is not reflected in the 2012 NAICS data. The city has a number of truck and automobile related businesses, including three truck service centers. Tye developed into a community where citizens enjoy living and working. Future plans for the community include improving business development to provide more employment opportunities within its boundaries. The City’s location along I-20 provides an attractive opportunity for new businesses to locate.

Table 2-9. City of Tye Jobs Per NAICS Business Industry Sector, 2012

<table>
<thead>
<tr>
<th>Industry</th>
<th>Estimate</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Agriculture, Forestry, Fishing and Hunting, and Mining</td>
<td>10</td>
<td>2.0%</td>
</tr>
<tr>
<td>Construction</td>
<td>93</td>
<td>18.6%</td>
</tr>
<tr>
<td>Manufacturing</td>
<td>39</td>
<td>7.8%</td>
</tr>
<tr>
<td>Wholesale Trade</td>
<td>11</td>
<td>2.2%</td>
</tr>
<tr>
<td>Retail Trade</td>
<td>64</td>
<td>12.8%</td>
</tr>
<tr>
<td>Transportation and warehousing, and utilities</td>
<td>28</td>
<td>5.6%</td>
</tr>
<tr>
<td>Information</td>
<td>6</td>
<td>1.2%</td>
</tr>
<tr>
<td>Finance and insurance, and real estate and rental and leasing</td>
<td>27</td>
<td>5.4%</td>
</tr>
<tr>
<td>Professional, scientific, and management, and administrative and waste management services</td>
<td>43</td>
<td>8.6%</td>
</tr>
<tr>
<td>Educational services, and health care and social assistance</td>
<td>86</td>
<td>17.2%</td>
</tr>
<tr>
<td>Arts, entertainment, and recreation, and accommodation and food services</td>
<td>39</td>
<td>7.8%</td>
</tr>
<tr>
<td>Other services, except public administration</td>
<td>31</td>
<td>6.2%</td>
</tr>
<tr>
<td>Public administration</td>
<td>24</td>
<td>4.8%</td>
</tr>
</tbody>
</table>

Source: US Census Bureau, American Community Survey, Selected Economic Characteristics, 2010-2012
2.5 Current Development Overview within the Study Area

The Study Area has become the commercial, retail, medical, and transportation hub of a 19-county area more commonly known as "The Big Country," and also known as the "Texas Midwest," and is part of the Central Great Plains ecology region. By the end of 2005, commercial and residential development reached record levels in and around the City of Abilene. Development surrounding Dyess AFB is characterized by the following:

North

The City of Tye lies immediately to the north of Dyess AFB. This includes residential development, industrial uses, and commercial uses within close proximity to the fence line. Other uses include two parks and a small cemetery. Most development within the city is clustered around Interstate 20, which is approximately one mile from the northern edge of the base. Because of the city’s location, most development is within the accident potential zones and high noise zones of the installation.

East

Land to the east of Dyess AFB is within the City of Abilene. The eastern side of the installation acts as a buffer between operations at the base and the city. Development adjacent to the base includes mobile home parks and low density residential development along Arnold Boulevard and Dub Wright Boulevard. Land surrounding Little Elm Creek, which leaves the base on the east side, remains open space. Further from the base and closer to US Highway 84 are multiple schools, churches, and various commercial uses along with a mixture of low to high density residential uses. Other uses east of the base include Elmwood Memorial Park and Scarborough Park.

South

Immediately south of Dyess AFB is open space and agricultural use along with Little Elm Creek. Further south is the unincorporated community of Caps, which includes industrial development, along with some sporadic and low density commercial and residential development. Development is focused along US Highway 277 and including Petrosmith, a large oilfield supply manufacturing company.

West

There is very little development west of Dyess AFB. While there is a majority of open space and agricultural use, there is some low density residential development. However, there are no established communities located immediately west of the base.

2.6 Transportation

Roadway System

The local roadway system consists of highways, primary arterials, minor arterials, major and minor collectors, and local residential streets. The intent of this local roadway system is to provide mobility and access to the various communities within the JLUS Study Area and to connect them to other communities outside the Study Area. In addition, some of these roadways serve the region’s residents and visitors by providing interstate and regional access. The following is a brief description of the transportation network in the Study Area. Figure 2-4 illustrates the transportation network.

Interstate 20 (I-20) is the major highway that traverses the Study Area, running east to west across the northern portion of Taylor County. I-20 runs 1,535 miles beginning at I-10 near Kent, Texas, to Florence, South Carolina, at I-95. It connects to Fort Worth and Dallas, Texas; Shreveport and Monroe, Louisiana; Jackson and Meridian, Mississippi; Birmingham, Alabama; Atlanta and Augusta, Georgia; and Columbia, South Carolina. The interstate crosses six states and intersects with several other major interstates.

The City of Abilene is surrounded by a beltway, made up of Interstate 20, US Highways 83, 84, and 277, and State Highway Loop 322. Business Loop 20 and Business Loop 83 are two principle arterials in the Study Area. Business Loop 20 bisects the city running east to west and Business Loop 83 runs north to south, bisecting the City of Abilene as Treadaway Blvd.

The Abilene Metropolitan Planning Organization Metropolitan Transportation Plan 2015-2014 and Thoroughfare Plan illustrate a proposed future roadway system for Abilene and the surrounding region. These plans suggest several new and enhanced roads surrounding Dyess AFB, including upgrading Farm to Market Road to an expressway to serve as a north-south corridor on the west side of Dyess AFB.
Rail
There is one major Union Pacific Railroad rail line that traverses the Study Area. In addition to this rail, Southern Switching Company (SSC) has operated a shortline railroad in Abilene since 1997. SSC interchanges with the Union Pacific Railroad line in downtown Abilene, at the junction of US Highway 83 and Business Loop 20, and operates 8.5 miles of railroad within Abilene.

SSC serves a variety of existing customers that are shipping and receiving commodities such as grain, feed, fertilizers, oil, scrap, corn sweetener, and lumber.

Air Transportation
A study of local airports is important when considering the flight operations at Dyess AFB. These are a mix of private and public general aviation airports that support some commercial operations. A brief description of the airports within the region is provided below.

Abilene Regional Airport (ABI) is the only public airport within the Study Area. It is located three miles southeast of downtown Abilene and owned and operated by the City of Abilene.

Most operations at the airport are general aviation and military training. Abilene Regional Airport is currently served by one commercial airline, Envoy Air operating as American Eagle, with eight daily flights to Dallas-Ft. Worth. Charter air carriers such as Sun Country Airlines continue to operate flights on an occasional basis from ABI to Las Vegas with mainline jet aircraft such as the Boeing 737. Abilene Aero is another tenant at Abilene Regional Airport, that provides various services including fuel, maintenance, parts, sales, and charter flights to most places in the continental US with a fleet of King Air B200 and King Air C-90B aircraft.

New airline service, especially to the northwest and west to major airline hubs such as Phoenix, AZ or Denver, CO is a top priority for airport management. Many area residents drive to the Dallas-Ft. Worth International Airport rather than fly out of ABI, and airlines have faced a challenge with regard to operating profitable jet service into ABI. The advent of 50-seat regional jets has the potential to provide air service with such aircraft from Abilene to more cities.

In addition to ABI, there are two private airports within the JLUS Study Area.

- **Elmdale Airpark Airport.** Elmdale Airpark Airport is located five miles east of downtown Abilene in Taylor County. The airport has one asphalt runway and one turf runway. Aircraft operations average about 26 per day.

- **Flying B Ranch Airstrip.** Flying B Ranch Airstrip is located five miles northwest of downtown Abilene. The airport has one turf runway and is only utilized for personal use.

The Abilene Regional Medical Center and Hendrick Medical Center have heliports. The Abilene Regional Medical Center heliport is in southern Abilene near Kirby Lake. The Hendrick Medical Center heliport is located in northern Abilene.
Please see the next page.
Inside Chapter 3 ...

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3.2 Dyess AFB Economic Benefit................................. 3-3
3.3 Military Strategic Importance ......................... 3-3
3.4 Installation Setting .................................................. 3-4
3.5 Current Mission Operations ......................... 3-4
3.6 Units at Dyess AFB .................................................. 3-8
3.7 Dyess AFB Mission Footprints ............................... 3-9

This chapter provides an overview of Dyess Air Force Base (AFB). This military profile describes the installation’s history, its location relevant to the JLUS Study Area, the economic and strategic importance of Dyess AFB, and a general description of the military operations conducted at the base and in the region.

Identifying and describing the various activities performed on the operating facilities and in the surrounding airspace provides valuable insight into the importance of Dyess AFB as a national strategic asset and as a part of the fabric of the surrounding communities. The purpose of providing this information is to enable stakeholders to make informed decisions about future development and economic growth within communities and institutions near Dyess AFB that could potentially impact the viability and future role of the base.
3.1 History of Dyess AFB

In 1942, the United States Army Air Forces built the original airfield on the site of what is today Dyess AFB. On December 18, 1942, the field was opened and was initially named Abilene Army Air Base (AAB). The first host unit as Abilene AAB was the 474th Base HQ and Airbase Squadron, established on December 18, 1942. The airfield was initially assigned to Second Air Force and its mission was to be a flying training center for cadets.

The name was changed on April 8, 1943 to Abilene Army Airfield (AAF). Groups that trained here during World War II included the 77th Reconnaissance Group, the 69th Tactical Reconnaissance Group, and the 408th Fighter-Bomber Group. With the end of the war, the base was declared inactive on January 31, 1946. Although assigned to Continental Air Command, Abilene AAF was classified as an inactive sub-base of Fort Worth Army Airfield and was sold to the city of Abilene for one dollar. It was used as a training facility for the Texas Army National Guard for several years.

Following the outbreak of the Korean War, there was a need for additional military installations to support the war effort. The City of Abilene believed the 1,500 acres of the former Abilene AAF was the perfect site to support this need. The City showed their determination for a new base by raising almost one million dollars to purchase an additional 3,500 acres adjacent to the site. In July 1952, Congress approved the $32 million needed to construct an Air Force Base on the Abilene AAF site. It was named Abilene Air Force Base and opened in April 1956. The first active combat unit was the 341st Bombardment Wing, which activated in September 1955. The 341st was part of the Strategic Air Command (SAC), flying the B-47 Stratojet, which it continued to operate until its deactivation in June 1961.

In December 1956, the name of the base was changed to Dyess Air Force Base in honor of the late Lt. Col. William E. Dyess, an Albany native who was captured by the Japanese in April 1942. After he escaped and was retraining in California, his aircraft caught fire in December 1943. He refused to bail out over a populated area and died by crashing on a vacant lot.

The 96th Bomb Wing (BW) moved to Dyess AFB in September 1957 and for a few years worked alongside the 341st. It included not just B-47 and B-52 nuclear bombers, but also the KC-97 and later on the KC-135 refueling aircraft. During the Cold War, the base was constantly on alert in case of nuclear attack.

In November 1959, the US Army conducted groundbreaking ceremonies at Dyess AFB for the battalion headquarters of the 5th Missile Battalion, 517th Artillery of the US Army Air Defense Command. Installed to defend the SAC bombers and Atlas F missile silos stationed at and around Dyess AFB, the two Nike Hercules sites were controlled by a "BIRDIE" system installed at Sweetwater Air Force Station in Nolan County, west of Dyess AFB.

The first C-130 Hercules aircraft were stationed at Dyess AFB in 1961 as part of the 64th Troop Carrier Wing. From 1963 to 1972, C-130s at Dyess AFB were assigned to the 516th Troop Carrier Wing, which was replaced in 1972 by the 463rd Tactical Airlift Wing, which supported operations during the Vietnam War. The 463rd Tactical Airlift Wing was reassigned from Tactical Air Command to Military Airlift Command in 1974. In 1997, Dyess’ C-130s were transferred back to Air Mobility Command, and the 317th Airlift Group was created as the parent unit for Dyess’ C-130 squadrons. The 317th Airlift Group was redesignated as the 317th Airlift Wing in July 2017.

From 1962 to 1965 Dyess AFB had 13 SM-65 Atlas Missile sites Stationed around it. The Dyess AFB sites were operated by the 578th Strategic Missile Squadron. After being decommissioned in 1965, the Atlas missiles were removed and all sites demilitarized.

In June 1985, the 96th BW received its first B-1B Lancer replacing the B-52 Stratofortress and in October 1986, assumed nuclear alert status. In October 1992, the parent commands of both wings changed. The 96th BW being reassigned to the newly established Air Combat Command and the 463d Airlift Wing (AW) was assigned to the new Air Mobility Command.

In October 1993, the 96th BW and 463d AW were both deactivated and replaced by the 7th Wing. The 7th Wing incorporated Dyess’ B-1Bs and C-130s, the latter which transferred from Air Mobility Command to Air Combat Command.
Within its first year, the 7th Wing’s diverse mission made it one of the most active units in the Air Force. The C-130s were deployed around the globe performing several airlift missions to Europe and the Persian Gulf. In 1997, the 7th Wing was redesignated the 7th Bomb Wing. Despite this separation as units, both the 7th Bomb Wing and the 317th Airlift Group (now the 317th Airlift Wing) remained at Dyess AFB.


### 3.2 Dyess AFB Economic Benefit

The Dyess AFB JLUS Study Area encompasses communities in central Texas. This includes Taylor County and the cities of Abilene and Tye. The Department of Defense (DOD) is a significant component of the regional and local economies. Dyess AFB supports a population of 13,860 people, and creates an additional estimated 1,518 indirect jobs. The breakdown of Dyess AFB’s supporting population is as follows:

- Appropriated Fund Military – 4,250
- Active Duty Military Dependents – 5,344
- Appropriated Fund Civilians – 362
- Non- Appropriated Fund Civilians and Private Business - 299
- Military Retirees Living in a 50-mile radius of Dyess AFB – 3,605

Through the purchase of goods and services and payment of salaries (payroll), Dyess provides an estimated $433 million (fiscal year [FY] 2014) in economic benefit to the local Abilene area economy on an annual basis. Figure 3-1 illustrates the total benefit separated into typical economic benefit categories.

Dyess AFB updates its Economic Impact Statement on a regular basis. The most recent Economic Impact Statement at the time this JLUS was written can be found online at the following website - http://www.dyess.af.mil/Portals/145/Docs/2016%20EIA_Trifold.pdf.

### 3.3 Military Strategic Importance

Dyess AFB is not only important to the local communities through its economic benefit, but also for the capabilities provided by the Dyess AFB mission components in support of a variety of forces located in Texas and the US.

The 7th Bomb Wing, the host unit at Dyess AFB, is one of only two B-1B Lancer strategic bombardment wings and the only B-1B formal training unit in the US Air Force. The 317th Airlift Wing, a tenant unit at Dyess AFB, has been in a continuously deployed status in support of the Global War on Terrorism since 2003, with elements being deployed into combat areas. The 436th Training Squadron provides formal training to Air Combat Command using 15 schools at Dyess AFB and 38 other programs exported directly to units for local training needs.

The base also supports two squadrons that are geographically separated units from other Air Force bases. The 77th Weapons Squadron is stationed at Dyess AFB, assigned to the Air Force Weapons School. The 77th Weapons Squadron is a geographically separated unit of the 57th Wing, which is assigned to Nellis AFB in Nevada. The mission of the squadron is to provide B-1B Lancer instructional flying. The 337th Test and Evaluation Squadron is part of the 53d Wing at Eglin AFB in Florida. Its primary mission is to test and evaluate modifications to the B-1B bomber and train future aircrews to fly upgraded B-1Bs.
Public Outreach and Involvement

As a community presence, Dyess AFB contributes more than just to the local economy. Dyess AFB recognizes that in a city, continued support of the local population and government officials is invaluable. Units and tenants at Dyess AFB engage in many public outreach efforts to be a greater part of the local and regional community. An overview of these programs and services is provided in Chapter 1 of this Background Report, in section 1.7 Local Communities Working Together.

3.4 Installation Setting

Dyess AFB is located in Taylor County in north-central Texas. The installation is within the city limits of the City of Abilene and is adjacent to the City of Tye. The base is approximately 180 miles west of the Dallas-Fort Worth metropolitan area. The primary highway transportation connection between Abilene and the Dallas-Fort Worth metropolitan area is Interstate 20.

The base is 5,366 acres and has one primary airfield with a runway (Runway 16/34) that measures 13,500 feet long by 300 feet wide. In addition, there is an asphalt-paved Landing Zone (LZ) 164/344, and a grated, rolled earth cement stabilized LZ 163/343. Each LZ is 3,500 feet long by 60 feet wide and are used exclusively for C-130 tactical training. Of the installation’s 5,366 acres, 2,645 acres have some degree of development constraint, primarily associated with wetlands, floodplains, safety zones, and noise from aircraft operations.

Existing land use is generally in a tiered development pattern extending east from the aircraft parking apron. The first tier includes most of the aircraft operation functions for the installation, and there are a few administrative facilities in close proximity to the flightline. The second tier land uses include many mission support functions, consisting mostly of industrial activities. Additional industrial land uses are located on the northern end of the installation, including munitions storage. The third tier is characterized by a mix of land uses that include unaccompanied housing, temporary lodging, outdoor recreation, community service, administration, and community commercial activities. Much of this third tier of land uses forms the area of “downtown” Dyess AFB. The Medical Center, installation golf course, and privatized family housing are on the east side of the installation.

One of the prominent features of Dyess AFB is its extensive collection of static military aircraft on display. Collectively known as the "Linear Air Park," it contains 30 aircraft from World War II to the present, many of them formerly based at Dyess AFB, and is located along the base’s main road. Funding for the aircraft pedestals was provided through donations from the Abilene community.

Figure 3-2 shows the installation setting of Dyess AFB, and Figure 3-3 provides a breakdown of the land use categories.

Source: Dyess AFB Installation Development Plan, 2015

3.5 Current Mission Operations

Mission

The 7th Bomb Wing's mission is to provide overwhelming long-range strike within hours anywhere in the world. It is also charged with producing combat-ready aircrews in the Air Force's only B-1B formal training unit. Groups assigned to the Wing include the 7th Operations Group, 7th Maintenance Group, 7th Mission Support Group, and 7th Medical Group.

In addition, the 7th Bomb Wing provides host-unit support for the 317th Airlift Wing, also stationed at Dyess AFB. The mission of the 317th Airlift Wing is to transport personnel and equipment into combat zones. The 317th Airlift Wing is often involved in humanitarian disaster relief and emergency evacuations of American nationals from troubled areas around the world.

The 7th Bomb Wing performs combat training with its 33 assigned Boeing B-1B Lancer Bomber aircraft. The 317th Airlift Wing uses its 27 assigned Lockheed Martin C-130J Super Hercules aircraft to perform airlift missions.
**Legend**

- **Gate**
- **Dyess Air Force Base**
- **Community**
- **Highway**
- **Local Road**
- **Railroad**
- **Stream / River**

**Installation Structure**

- Housing
- Other


**Figure 3-2**

Dyess AFB Installation Setting

Background Report
Figure 3-3

Dyess AFB Land Use

Legend

- Airfield Surface / Runway
- Airfield Clear Area
- Aircraft Operations and Maintenance
- Administration
- Community Commercial & Services
- Medical / Dental
- Manufacturing / Production
- Housing (Accompanied)
- Housing (Unaccompanied)
- Open Buffer Zone
- Outdoor Recreation
- Water

Source: Dyess AFB, 2016.
Table 3-1 provides an overview of the aircraft that operate at Dyess AFB.

**Table 3-1. Overview of Aircraft Stationed at Dyess AFB**

### B-1B Lancer

Carrying the largest payload of both guided and unguided weapons in the Air Force inventory, the multi-mission B-1B is the backbone of America's long-range bomber force. It can rapidly deliver massive quantities of precision and non-precision weapons against any adversary, anywhere in the world, at any time.

- **Length:** 146 feet
- **Height:** 34 feet
- **Wingspan:** 137 feet
- **Speed:** 900+ miles per hour
- **Ceiling:** 30,000+ feet
- **Payload:** 75,000 pounds
- **Armament:** 84 500-pound Mk-82 or 24 2,000-pound Mk-84 general purpose bombs; up to 84 500-pound Mk-62 or 8 2,000-pound Mk-65 Quick Strike naval mines; 30 cluster munitions or 30 Wind-Corrected Munitions Dispensers; up to 24 2,000-pound GBU-31 or 15 500-pound GBU-38 Joint Direct Attack Munitions; up to 24 AGM-158A Joint Air-to-Surface Standoff Missiles; 15 GBU-54 Laser Joint Direct Attack Munitions
- **Crew:** Four (aircraft commander, copilot, and two combat systems officers)

*Source: US Air Force Fact Sheets, B-1B Lancer, 2015*

### C-130J Super Hercules

The C-130J Super Hercules primarily performs the tactical portion of the airlift mission. The aircraft is capable of operating from rough, dirt strips and is the primary transport for airdropping troops and equipment into hostile areas. Basic and specialized versions of the aircraft airframe perform a diverse number of roles, including airlift support, aeromedical missions, weather reconnaissance, aerial spray missions, firefighting duties for the U.S. Forest Service, and natural disaster relief missions.

- **Length:** 97 feet, 9 inches
- **Height:** 38 feet, 10 inches
- **Wingspan:** 132 feet, 7 inches
- **Speed:** 417 miles per hour, at 22,000 feet
- **Ceiling:** 28,000 feet, with 42,000 pounds payload
- **Max Allowable Payload:** 42,000 pounds
- **Max Normal Payload:** 34,000 pounds
- **Range:**
  - 2,071 miles (1,800 nautical miles) at Maximum Normal Payload
  - 1,841 miles (1,600 nautical miles) with 35,000 pounds of payload
- **Crew:** Three (two pilots and loadmaster)

*Source: US Air Force Fact Sheets, C-130 Hercules, 2014*
3.6 Units at Dyess AFB

The Dyess AFB mission is supported by multiple units (under the direct command of the Commanding Officer of Dyess AFB) and tenant units (units that report to other organizations and utilize space or facilities at Dyess AFB) that enable the missions to be executed on a daily basis. The following pages briefly summarize major units or tenants and their functions at the base.

The 7th Bomb Wing, a component of Global Strike Command, is the host unit at Dyess AFB. The 7th Bomb Wing operates B-1B aircraft and is the US Air Force’s only B-1B formal training unit. Groups assigned to the wing include the 7th Operations Group, the 7th Maintenance Group, the 7th Mission Support Group and the 7th Medical Group. The 317th Airlift Wing is a major tenant command at Dyess AFB. Other tenants supporting the 7th Bomb Wing include the 29th Training Systems Squadron, the 337th Test and Evaluation Squadron, and the 77th Weapons Squadron.

7th Bomb Wing Host Unit

The 7th Bomb Wing (7 BW) is responsible for providing combat-ready B-1B aircraft, crews and associate combat support for global engagement taskings. The 7th Bomb Wing is comprised of many units that execute operations, maintenance, support, and medical functions and is host to 16 associate units. As a component of the Air Force Global Strike Command, the 7th Bomb Wing’s mission is to provide overwhelming long-range strike within hours anywhere in the world. The 7th Bomb Wing is also charged with producing combat-ready aircrews in the Air Force’s only B-1B formal training unit.

The 7th Bomb Wing consists of four groups:

- **The 7th Operations Group.** The 7th Operations Group (OG), the largest B-1B operations group, is responsible for executing global conventional bombing missions. Three operational and training flying squadrons are assigned to the 7th OG: the 9th Bomb Squadron, 28th Bomb Squadron, and 7th Operations Support Squadron.

- **The 7th Maintenance Group.** The 7th Maintenance Group provides maintenance support to the bomb wing, deployed units and associate units assigned to Dyess AFB. The Maintenance Group includes maintenance of aircraft, components, equipment, as well as, general operations and munitions.

- **The 7th Mission Support Group.** The 7th Mission Support Group is responsible for all base facilities, support, readiness and logistics functions. The Mission Support Group includes civil engineering, communications, supply, transportation, security forces, and services.

- **The 7th Medical Group.** The 7th Medical Group provides health care through four Patient Centered Medical Home teams staffed by physicians, flight surgeons, pediatricians, general medical officers, physician assistants, and nurse practitioners. The Medical Group comprises Aerospace Medicine, Operations and Support Squadrons.

Major Tenants

29th Training Systems Squadron

The 29th Training Systems Squadron (TSS) is the functional manager and technical expert for testing, modification, acquisition, and certification of all Combat Air Forces (CAF) Training Systems. The unit conducts developmental, acceptance, and operational testing for all CAF Training Systems. It is also tasked with implementing Major Air Command (MAJCOM) training system quality assurance programs. The 29th TSS also manages and conducts all CAF simulator certification.

77th Weapons Squadron

The 77th Weapons Squadron is an Air Force unit stationed at Dyess AFB, assigned to the Air Force Weapons School. The 77th Weapons Squadron is a geographically separated unit of the 57th Wing, which is assigned to Nellis AFB in Nevada. The mission of the squadron is to provide B-1B Lancer instructional flying.
317th Airlift Wing

The 317th Airlift Wing (317 AW) is the major tenant at Dyess AFB. The 317 AW is a tactical airlift organization, flying the C-130J Super Hercules. The 317 AW is comprised of the 39th and 40th Airlift Squadrons, 317th Aircraft Maintenance Squadron, 317th Maintenance Squadron and the 317th Operations Support Squadron.

The 39th Airlift Squadron and 40th Airlift Squadron provide intratheater airlift worldwide through tactical airlift and airdrop operations. The two squadrons also conduct humanitarian efforts and aeromedical evacuation. The 317th Aircraft Maintenance Squadron performs flightline maintenance on the assigned C-130Js. The 317th Maintenance Squadron performs on- and off-equipment maintenance on the C-130J aircraft. The 317th Operations Support Squadron is responsible for directing flight operations, war plans, scheduling, combat tactics, aircrew training, cargo delivery, deployment planning and execution, simulator training, mobility processing, maintenance analysis, and aircrew flight equipment functions.

337th Test and Evaluation Squadron

The 337th Test and Evaluations Squadron is a part of the 53d Test and Evaluation Group of the 53d Wing, Eglin AFB. Its primary task is to test and evaluate modifications on the B-1B bomber, as well as to train future aircrews to fly upgraded B-1Bs. The 337th is headquartered at Dyess AFB and operates out of a number of bases throughout the US.

436th Training Squadron

The 436th Training Squadron provides formal training to Air Combat Command using 15 schools at Dyess AFB and 38 other programs exported directly to units for local training needs. The squadron functions for Air Combat Command providing classroom instruction for over 10 courses to students from every major command and multimedia productions used throughout the DOD.

489th Bomb Group

The Air Force reactivated the 489th Bomb Group as an Air Force Reserve unit on 17 October 2015, exactly 70 years after it was inactivated. It will operate as a classic association unit of the 7th Bomb Wing flying the B-1B Lancer. The 489BG is, however, assigned to the 307th Bomb Wing at Barksdale Air Force Base, Louisiana.

3.7 Dyess AFB Mission Footprints

Mission activities conducted on and around Dyess AFB can potentially generate impacts on surrounding communities if incompatible / not recommended land uses are developed. Examples of potential mission impacts on surrounding communities include noise and vibration from aircraft and the risk of an aircraft accident. Conversely, the military mission is susceptible to hazards and other incompatible / not recommended land uses created by certain types of civilian development or activities, such as obstructions to air space or light and glare from development affecting pilot vision.

Understanding the overlapping spatial patterns of these operational areas, or “mission footprint” is essential for promoting compatible / recommended and informed land use decisions and developing the recommended strategies presented in Chapter 6 of this JLUS.

There are several elements that make up the mission footprint that extends outside the Dyess AFB boundaries. These essential elements play a key role in the installation’s viability for sustaining current and future mission operations.
Dyess AFB Mission Footprint Elements

The Dyess AFB mission footprint elements are listed below and described in more detail on the following pages.

- Airfield Flight Patterns
- Imaginary Surfaces
- Drop Zones
- Airfield Accident Potential Zones
- Aircraft Noise Contours
- Airspace Control
- Part 77 Vertical Obstruction Compliance
- Bird / Wildlife Aircraft Strike Hazard (BASH) Relevancy Area

Airfield Flight Patterns

Flight patterns are documented in the Air Installation Compatible Use Zone (AICUZ) Study and depict typical aircraft flight operations that are associated with the airfield. The flight patterns are developed using information gathered from air traffic controllers, pilots, and other sources and are based on several factors, including avoiding heavily populated areas as much as possible; US Air Force criteria for speed, rate of climb, and turning radius of the specific type of aircraft; minimizing noise impacts, especially at night; and coordination with the Federal Aviation Administration (FAA) to avoid conflicts with civilian aircraft. While the identified flight patterns represent typical flight operations, they may vary depending on circumstances such as weather, mission requirements, and other air traffic.

According to the Dyess AFB AICUZ Study, the following basic flight patterns occur at Dyess AFB:

- Straight-in approaches,
- Overhead break landing patterns,
- Tactical approaches,
- Combat approaches and departures,
- Instrument Flight Rule or radar closed patterns, and
- Visual Flight Rule or closed patterns.

Aircraft that arrive to and depart from the airfield at Dyess AFB use Runway 16 on the northwestern side of the base approximately 79 percent of the time and Runway 34 on the southeastern side approximately 21 percent of the time. Operations at the LZs are always conducted in the same direction as operations at the main runway. There are various factors that go into why one runway direction is used over another, but the primary factor is wind direction.

The closed pattern flight patterns are isolated to areas surrounding the installation and consist of low-level altitude flights. The majority of closed pattern operations at Dyess AFB are flown on the west side of the base where the land underneath is less developed, however sometimes flights occur over western areas of the City of Abilene.

Aircraft based at Dyess AFB periodically use the Abilene Regional Airport to the east of the base for touch and go operations.

Figures 3-4a through 3-4d illustrate the typical flight patterns used by Dyess AFB aircraft. Other flight paths may also be used depending on factors such as weather or mission requirements.

Source: Dyess Air Force Base Air Installation Compatible Use Zone Study, January 2015
Mission Footprint: Flight Patterns: Departure

Legend
- Dyess Air Force Base
- County
- Community Covered by JLUS
- Tye Extraterritorial Jurisdiction
- Abilene Extraterritorial Jurisdiction
- Other Community

Source: Dyess AFB 2013 AICUZ.
Figure 3-4b
Mission Footprint: Flight Patterns: Arrival

Legend
- **Dyess Air Force Base**
- **Community Covered by JLUS**
- **Tye Extraterritorial Jurisdiction**
- **Abilene Extraterritorial Jurisdiction**
- **Other Community**

Source: Dyess AFB 2013 AICUZ.
Mission Footprint: Flight Patterns: Closed Pattern

Legend

- Dyess Air Force Base
- County
- Community Covered by JLUS
- Tye Extraterritorial Jurisdiction
- Abilene Extraterritorial Jurisdiction
- Other Community

Source: Dyess AFB 2013 AICUZ.
Figure 3-4d
Mission Footprint: Flight Patterns: Interfacility

Legend
Flight Pattern
- Dyess Air Force Base
- County
- Community Covered by JLUS
- Tye Extraterritorial Jurisdiction
- Abilene Extraterritorial Jurisdiction
- Other Community

Source: Dyess AFB 2013 AICUZ.
Imaginary Surfaces
Air Force obstruction criteria in Unified Facilities Criteria 3-260-01 are based on Federal Aviation Regulations Part 77, specifying a series of imaginary height restriction surfaces surrounding an airfield. The imaginary surfaces of an active runway are used to define the required airspace that must remain free of vertical obstructions in the vicinity of aviation operations to ensure safe flight operations. Figure 3-5 shows an example of the slope of the surfaces that help guide military and community planners in land use planning around an airfield. Structures should not exceed the stipulated heights to protect the navigable airspace associated with the airfield, the safety of pilots, and people and the land uses on the ground. This is especially important in the clear zone and the approach-departure clearance surfaces.

The extent or size of an imaginary surface depends on the type of runway. Military runways are categorized as either Class A or Class B based on the type of aircraft that use the runways. Class A runways are for smaller or lighter aircraft. Class B runways are the category for the majority of military aircraft. Dyess AFB primary runway (Runway 16/34) is classified as a Class B runway and its relative imaginary surfaces are shown on Figure 3-6. For a complete technical explanation of the imaginary and transitional surfaces for Dyess AFB, see Chapter 5, Compatibility Assessment (Section 5.23 Vertical Obstructions).

Unified Facilities Criteria 3-206-01 also establishes airspace imaginary surfaces associated with landing zones.

Drop Zone Operations
Air Force Instruction (AFI) 13-217, Drop Zone and Landing Zone Operations (USAF 2007), outlines the minimum size of a Drop Zone, marking criteria, aerial delivery methods, and parameters for aircraft conducting airdrops. A specific minimum elevation, or floor, is established for the Drop Zone approach and departure corridors. Vertical penetrations into the floor of these corridors would severely limit the viability of airlift training conducted by the C-130J squadrons.

The north-to-south and south-to-north Marrion Drop Zone corridors at Dyess AFB are shown on Figure 3-7. The height of the Drop Zone corridors extends to 2,000 feet above the Drop Zone itself.

Airfield Accident Potential Zones
Per DOD instruction, Accident Potential Zones (APZs) are developed to assist military and community planners in developing land uses that are compatible / recommended with airfield operations, thereby protecting health and safety. Within these zones are recommended types, densities, and intensities of land uses. While the likelihood of an aircraft mishap occurring is remote, the identified APZs provide the best practical solution for fostering public safety.

There are typically three safety zones that extend from the ends of runways: Clear Zone (CZ), APZ I, and APZ II. These three zones occur on each end of Runway 16/34 and are illustrated on Figure 3-8.

The CZ begins at each end of the runway and measures 3,000 feet wide by 3,000 feet long. This is the area that has the highest potential of an aircraft incident. It is recommended that no development occur in the CZ unless it is a use that is needed for safe operations of aircraft.

The APZ I is an area beginning at the end of each CZ at a width of 3,000 feet and a length of 5,000 feet. This area has a lower potential for accidents and therefore has less restrictive development recommendations.

The APZ II is an area that begins at the end of each APZ I and is 3,000 feet wide by 7,000 feet long. Again, the accident potential in this area is further reduced, and as a result, some additional development types are compatible / recommended.

The two LZs have smaller safety zones at their ends due to their limited use. They each have only two zones: a CZ and an APZ-LZ.

The LZ CZ begins at each end of the landing zone, with an inner width extending out 135 feet to each side of the centerline, and tapering out to a width of 250 feet on each side of the centerline. The LZ CZ extends out for 500 feet along the extended assault strip centerline.
Figure 3-5. Example Views of the Different Imaginary Surface Layers
Mission Footprint: Imaginary Surfaces

Legend
- Imaginary Surfaces:
  - Primary Surface
  - Conical Surface (20:1)
  - Outer Horizontal Surface
  - Transitional Surface (7:1)
  - Approach/Departure Clearance Surface (Horizontal)
  - Inner Horizontal Surface

- Dyess Air Force Base County
- Community Covered by JLUS
- Tye Extraterritorial Jurisdiction
- Abilene Extraterritorial Jurisdiction
- Other Community
- Interstate

Source: Dyess AFB 2013 AICUZ.
Mission Footprint: Drop Zones

Legend

- BRONTE C-130 Drop Zone
- Dyess Air Force Base
- Community Covered by JLUS
- Tye Extraterritorial Jurisdiction
- Abilene Extraterritorial Jurisdiction
- Other Community
- Interstate
- Highway
- Other Main Road
- Railroad
- Water Body

Source: Dyess AFB 2013 AICUZ.

Figure 3-7

Tennyson Drop Zone

Medium Formations Floor Elevation: 2,600' MSL
Large Formations Floor Elevation: 2,870' MSL

Marrion C-130 Drop Zone
North to South Drop Zone Corridor Floor Elevation: 2,379' MSL
South to North Drop Zone Corridor Floor Elevation: 2,479' MSL
Mission Footprint: Accident Potential Zones

Legend

<table>
<thead>
<tr>
<th>Accident Potential Zones</th>
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<tr>
<td>Clear Zone</td>
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<tr>
<td>APZ I</td>
<td>Community Covered by JLUS</td>
</tr>
<tr>
<td>APZ II</td>
<td>Interstate</td>
</tr>
</tbody>
</table>

*Ty Extraterritorial Jurisdiction (ETJ)

Water Body

Stream / River

Interstate

Highway

Local Road

Railroad

Runway / Airfield

*Portions of the APZ that lie outside of the Dyess AFB Perimeter and that do not fall within the City of Tye ETJ are located within the City of Abilene's ETJ

Source: Dyess AFB 2013 AICUZ.
The APZ-LZ for the landing zone begins at the far end of the CZ and extends out for 250 feet on each side of the centerline for 2,500 feet along the extended landing zone centerline.

The Dyess AFB AICUZ Study provides a listing of the land uses that are not recommended for use in the runway CZ, APZ I and APZ II and the LZ CZ and APZ-LZ. In these recommendations, some land uses also have recommended limits on density and intensity of use. In 2009, the City of Abilene adopted an Airport Zoning Ordinance that addressed land development within the CZ and APZs that are within the jurisdiction of Abilene’s extraterritorial jurisdiction. The Airport Zoning Ordinance was coordinated among the City of Abilene, Taylor County, Dyess AFB, and affected property owners who live or own property in the CZ and APZs.

*Source: Dyess Air Force Base Air Installation Compatible Use Zone Study, January 2015*

**Aircraft Noise Contours**

Aircraft noise is produced from flight operations (overflight, take-offs, landings, touch-and-go operations) and engine maintenance run-ups. An engine run-up is a maintenance procedure performed on the airfield to test for proper engine performance. The Air Force considers how its operations impact the local community by calculating an average-weighted noise level measured as a day-night average sound level (DNL). The Dyess AFB AICUZ uses the DOD NOISEMAP program to produce noise contours indicating noise exposure levels from aircraft operations. The noise contours are based on an average of all types of aircraft at Dyess AFB.

The contour lines developed in the model range from 65 decibel (dB) DNL to 80+ dB DNL and increase in increments of five dB. The 80+ dB DNL is the loudest contour line computed and the 65 dB DNL is the quietest. The DNL measure has been determined to be a reliable measure of community sensitivity to aircraft noise and has become a standard metric used to map aircraft noise impacts.

Noise contours were generated in 2013 for the Dyess AFB’s January 2015 AICUZ Study to reflect a change in aircraft equipment (C-130J Super Hercules) and mission operations. Aircraft operational and maintenance data was obtained to derive average daily operations by runway and type of aircraft. Data was input into the NOISEMAP program to produce DNL contours. The previous noise contours were developed in 2007 and covered a larger area than the new contours developed in 2013. The 2013 noise contours are illustrated on Figure 3-9.

The noise contours to the south of the base are mostly over open space and undeveloped land. However, the noise contours to the north of the base cover the City of Tye, with some noise sensitive uses, such as housing within the 70 and 75 dB DNL contours.

Noise exposure can also be a concern for certain sensitive biological resources that may be near the airfield. In reviewing noise contours, it should be noted that these are annual averages, and noise exposure at any given time will vary based on a number of factors including weather.

In efforts to minimize noise for citizens in surrounding communities, engine run-up locations have been placed in areas that are less likely to impact day to day life. Dyess AFB utilizes two B-1B test cells that are equipped with suppressors and located east of the primary runway. Dyess AFB does not typically operate late night / early morning engine run-ups, but there is the potential for unpredicted contingencies that would require nighttime engine run-ups.

*Source: Dyess Air Force Base Air Installation Compatible Use Zone Study, January 2015*

**Airspace Control**

To help air traffic controllers and pilots deal with varying traffic conditions in the sky, United States airspace has been separated into six different classes (A, B, C, D, E, and G), illustrated on Figure 3-10. These different classes have different requirements for entry into the airspace, pilot qualifications, radio and transponder equipment, and Visual Flight Rules (VFR) weather minimums.
Legend

2013 DNL Noise Contour (dB)

65 DNL
70 DNL
75 DNL
80 DNL
85 DNL

Dyess Air Force Base
County
Community Covered by JLUS
Tye Extraterritorial Jurisdiction
Abilene Extraterritorial Jurisdiction
Other Community

Interstate
Highway
Local Road
Railroad
Runway / Airfield
Water Body
Stream / River

Source: Dyess AFB 2013 AICUZ.

Figure 3-9
Mission Footprint: Noise Zones
Within the JLUS Study Area, Dyess AFB and Abilene Regional Airport are surrounded by Class C airspace, a portion of which is shared. The vertical boundary is 4,000 feet above the airport elevation (the ceiling). The core surface area has a radius of five nautical miles and goes from the airport elevation to the ceiling of the Class C airspace. The upper shelf area has a radius of ten nautical miles, and extends from as low as 1,200 feet up to the ceiling of the airspace.

An air traffic control (ATC) clearance is not required in Class C airspace, but pilots must be in radio communication with ATC, and aircraft must be equipped with an altitude-encoding transponder. Pilots flying under VFR in Class C airspace must have at least three miles of visibility. They must also maintain a specified distance from the clouds. Figure 3-11 shows the Class C airspace areas around Dyess AFB and Abilene Regional Airport.

Part 77 Vertical Obstruction Compliance
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, declaring that flights 500 feet or more Above Ground Level (AGL) do not represent a compensable taking because they enjoy a free right-of-passage without liability to the owners below.

Another important outcome of the Act is Federal Aviation Regulation Title 14 Part 77, commonly known as Part 77, which provides the basis for evaluation of vertical obstruction compatibility/recommended land use. This regulation provides information to evaluate the potential for a vertical obstruction based on the elevation of the airfield, the height and resulting elevation of the new structure or facility, and the location of the structure or facility relative to the airfield in question. This regulation promulgates obstruction standards relative to their distance from the ends of a runway as well as their relationship to airport imaginary surfaces.
Mission Footprint: Airspace Control

Legend
- Class C Control Area
- Class E0 Control Area
- Dyess Air Force Base
- County
- Community Covered by JLUS
- Tye Extraterritorial Jurisdiction
- Abilene Extraterritorial Jurisdiction
- Other Community
- Interstate
- Highway
- Stream / River
- Runway / Airfield

Source: Dyess AFB 2013 AICUZ.
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 FAA Internet site at http://www.faa.gov/.

As of January 29, 2013, the main focus of Part 77.17 is to establish standards 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 several measures. A key reference used for compatibility/recommended land use planning is the following:

A height that is 200 feet AGL or above the established airport elevation, whichever is higher, and within three nautical miles of the established reference point of an airport, excluding heliports, with its longest runway more than 3,200 feet in actual length is considered a vertical obstruction. 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.

Figure 3-12 illustrates the Part 77 rings around Dyess AFB. Obstruction height elevations are measured from the Dyess AFB airfield elevation, which is 1789 feet above mean sea level. Note that this is in addition to, not a replacement of, the imaginary surfaces discussed previously.

Bird / Wildlife Aircraft Strike Hazard Relevancy Area

Birds and animals can present a significant hazard to military flight operations. While fatal accidents resulting from bird or wildlife strikes have been limited, impacts can be a safety concern and cause significant damage to aircraft. Bird or animal strikes in the US since 1980 have approached approximately 20,000 events that have resulted in 2 deaths, 25 aircraft destroyed, and over $300 million in damage.

Certain types of land uses attract birds and wildlife, such as open water areas, standing water, and other natural areas. Although birds exist in the Study Area that could present an aircraft strike hazard, there are no known surface water bodies at Dyess AFB that are contributing to Bird / Wildlife Aircraft Strike Hazard (BASH) problems. Relative to compatibility/recommended land use, the control of bird attractants near the airfield is important.

A BASH program is in place at Dyess AFB to reduce the impact of birds on aircraft operations. Figure 3-13 shows a five-mile radius around the Dyess AFB airport operations area. Based on FAA statistical analysis, this is the primary area of concern for BASH incidents to occur, and the primary focus of compatibility/recommended land use planning for this issue.
Mission Footprint: Part 77

Legend:
- Up to 200' @ 3NM
- Up to 300' @ 4NM
- Up to 400' @ 5NM
- Up to 500' @ 6NM
- Dyess Air Force Base
- County
- Community Covered by JLUS
- Tye Extraterritorial Jurisdiction
- Abilene Extraterritorial Jurisdiction
- Other Community
- Interstate
- Highway
- Local Road
- Railroad
- Runway / Airfield
- Water Body
- Stream / River

Note: Obstruction height elevations are measured from the Dyess AFB airfield elevation, which is 1789 feet above mean sea level.

Figure 3-12

Mission Footprint: Part 77

Background Report
Legend

- 5-mile BASH Relevancy Area
- Dyess Air Force Base
- County
- Community Covered by JLUS
- Tye Extraterritorial Jurisdiction
- Abilene Extraterritorial Jurisdiction
- Other Community
- Interstate
- Highway
- Local Road
- Railroad
- Runway / Airfield
- Water Body
- Stream / River


Mission Footprint: BASH Relevancy Area

Figure 3-13
There are many existing tools that can be used to encourage, promote, and manage compatibility / recommended land use between military installations and their neighboring communities. This chapter provides an overview of compatibility tools currently used or applied in evaluating and addressing compatibility issues in the Dyess Air Force Base (AFB) Joint Land Use Study (JLUS) area. Relative to compatibility / recommended land use planning, there are a number of existing plans and programs which are either designed to address compatibility / recommended land use directly or which indirectly address compatibility issues through the topics they cover. This summary provides an overview of key plans and programs that impact compatibility / recommended land use planning organized by level of government.

There are three types of planning tools evaluated relative to their applicability: 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. Conditional tools include memorandums of understanding, intergovernmental agreements, and other policy documents such as comprehensive plans and general plans that can be periodically modified. This review is meant to provide an overview of applicable planning tools and determine how each may apply to compatibility issues identified by the Dyess AFB JLUS process, as presented under the compatibility factors discussed in Chapter 5, Compatibility Assessment.

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The tools listed in this chapter are not exhaustive, but are meant to provide a general overview of the primary tools currently utilized or available in the JLUS Study Area. The overview of plans and programs is organized by level of government in the following order:

- Federal Programs and Policies
- Dyess AFB Plans and Programs
- State of Texas Plans and Programs
- Regional Planning Tools
- State of Texas Local Jurisdiction Planning Tools
- Taylor County
- City of Abilene
- City of Tye
- Other Resources

4.1 Federal Programs and Policies

Federal policy, laws, and programs have evolved to impact almost every aspect of land use. This is particularly true in metropolitan areas that host major military facilities such as Dyess AFB. A broad range of federal plans, programs, and actions impact Dyess AFB both directly and indirectly. However, depending on the subject area, opportunities for vertical integration and cross jurisdictional collaboration vary widely. Federal programs and policies are carried out by the various arms of the federal government, although in some cases these tools also authorize state, county, regional or local governmental agencies to implement related policies, programs, and regulations. The following federal programs and policies were evaluated to assist in determining where areas of improvement could enable better compatibility/recommended land use planning at the local level.

The following does not attempt to provide an exhaustive accounting of every relevant Federal law or program, but simply attempts to capture those considered to be most relevant to the assessment of compatibility issues and to the potential strategies stakeholders might employ to avoid or mitigate conflicts. The federal plans and programs that are included in this section are:

- Air Force Instruction 90-2001
- Air Installation Compatible Use Zone Study Program
- Clean Air Act
- Clean Water Act
- Comprehensive Environmental Response, Compensation, and Liability Act
- Department of Defense Conservation Partnering Initiative
- DOD Energy Siting Clearinghouse
- DOD Operational Noise Manual
- Department of Housing and Urban Development Noise Regulation
- Endangered Species Act
- Federal Land Policy and Management Act of 1976
- Federal Aviation Act
- Federal Aviation Administration Order JO 7110.6ST
- National Environmental Policy Act
- National Pollutant Discharge Elimination System
- Noise Control Act of 1972
- National Historic Preservation Act of 1966
- Partners in Flight Program
- Proposed Protection of Military Airfields from Wind Turbine Encroachment Acts
- Safe Drinking Water Act
- The Sikes Act
- Telecommunications Act of 1996 and the Federal Communications Commission
- US Avian Hazard Advisory System

**Air Force Instruction 90-2001**

Air Force Instruction 90-2001 was published in September 2014 to implement the Encroachment Management Program. The Instruction applies to all Air Force installations to address encroachment issues and prevent or reduce the impacts of encroachment. The Instruction includes an Encroachment Management Framework, which has four elements (Organize, Assess, Act, and Monitor) to address the variety of challenges. Organization requires leadership involvement, a cross-functional management structure, an issue evaluation structure, a designated Executive Director at the installation level, and a geographic scope. Assessment includes studying internal and external relationships and developing encroachment studies, such as an Installation Complex Encroachment Management Action Plan (ICEMAP). Action involves implementation of programs. Lastly, monitoring involves maintaining awareness of mission needs and encroachment issues.
Air Installation Compatible Use Zone Study Program

The Air Installation Compatible Use Zone (AICUZ) program was created by the DOD in 1973 to address noise and safety hazards associated with aviation operations. The AICUZ program provides guidelines to promote compatible / recommended land development in areas subject to operational noise and accident potential. The program was initiated to protect the public’s health, safety, and welfare, as well as to protect military airfields from encroachment by incompatible / not recommended uses and structures. The AICUZ framework evaluates noise from military aircraft, and applies the concept of clear zones / accident potential zones, with corresponding development / building densities and intensities designed to encourage compatibility / recommended uses between military operations and communities. The three primary elements of the AICUZ are:

- **Health, Safety, and Welfare.** These elements seek to reduce the nuisance of excessive noise generated by aircraft operations and public danger by discouraging the development of incompatible / not recommended land uses such as businesses and housing in Accident Potential Zones.

- **Public Investment.** Promoting compatibility / recommended uses between a military installation and local communities safeguards military operations and protects the public’s investment in the installation.

- **Public Awareness and Communication.** By working with the community and informing local citizens and property owners of operations and safety measures, the military can promote safety for community residents. As local leaders work with military officials and residents / property owners to consider compatible / recommended development practices, their relationship is strengthened through the resolution of mutual concerns.

Clean Air Act

The Clean Air Act (CAA) is the comprehensive federal law that regulates air emissions from stationary and mobile sources in order to control air pollution. Under the CAA, the Environmental Protection Agency (EPA) establishes limits on six criteria pollutants through the National Ambient Air Quality Standards (NAAQS). Standards are established to protect public health and public welfare. The CAA also gives EPA the authority to limit emissions of air pollutants originating from sources such as chemical plants, utilities, and steel mills. Individual states may have more stringent air pollution laws, but they may not have weaker pollution limits than those set by EPA. Under the law, states have to develop State Implementation Plans (SIPs) that outline how each state will control air pollution under the CAA.

Dyess AFB is in an area in attainment for all criteria pollutants.

Clean Water Act

The Clean Water Act (CWA) governs the management of water resources and controls and monitors water pollution in the US. The CWA establishes goals for 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 sources.

Comprehensive Environmental Response, Compensation, and Liability Act

This law was designed to assist in the clean-up of sites with hazardous contaminants to respond directly to releases or threatened releases of hazardous substances that may endanger public health or the environment. The Comprehensive Environmental Response, Compensation, and Liability Act:

- established prohibitions and requirements concerning closed and abandoned hazardous waste sites,
DOD Readiness and Environmental Protection Integration

To implement the authority provided by the Department of Defense Conservation Partnering Initiative, the DOD established the Readiness and Environmental Protection Integration (REPI) Program. This initiative enables the DOD to work with state and local governments, NGOs, and willing landowners to limit encroachment and incompatible / not recommended land use.

REPI funds are used to support a variety of DOD partnerships that promote compatible / recommended 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.

It is important for Dyess AFB to ensure that military activities are not encroached upon by incompatible / not recommended land uses. The REPI gives local agencies an opportunity to partner with the military and other local agencies. This will allow for buffers around the base to be established to help further protect its mission.

DOD Energy Siting Clearinghouse

Section 358 of the 2011 National Defense Authorization Act 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 timeframe 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.

- provided for liability of persons responsible for releases of hazardous waste at these sites, and
- established a trust fund to provide for cleanup when no responsible party could be identified.

The Comprehensive Environmental Response, Compensation, and Liability Act has relevance as a potential JLUS tool through the Superfund environmental program, established to address hazardous waste sites. Hazardous waste is sometimes present in or around military installations, particularly where munitions and ordnance are stored and used for training purposes, and if not disposed of properly could be potentially harmful to the installation tenants and surrounding communities. While the Superfund cleanup process may be complex, it protects communities and the environment from further contamination.

**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 Department of Defense (DOD) to partner with other federal agencies, states, local governments, and conservation-based Non-Governmental Organizations (NGOs) to set aside lands near military bases for conservation purposes and to prevent incompatible / not recommended 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. 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.
DOD Operational Noise Manual
The Operational Noise Manual was prepared by the US Army Center for Health Promotion and Preventive Medicine and released in November 2005. It provides a practical reference for military and civilian personnel with duties and responsibilities in operational noise management so that they can work together to be good neighbors and reduce noise issues. The manual assists personnel in understanding and implementing current DOD environmental policy and guidance. The majority of the manual is devoted to the following subjects: Characteristics of Sound; Effects of Noise; Military Noise Sources; Noise Monitoring; Reduction of Noise Conflicts; and more.

Department of Housing and Urban Development Noise Regulation
The United States Department of Housing and Urban Development (HUD) has instituted policies through Section 24 Code of Federal Regulations (CFR) Part 51 that are designed to promote the creation of controls and standards for community noise abatement by state and local governments. The focus of these regulations is to reduce noise levels within residential developments funded by HUD. Included among the various policies are:

1. A requirement that noise exposure and sources of noise be given adequate consideration as an integral part of urban environment in connection with all HUD programs, which provide financial support to planning;

2. A withholding of HUD assistance for the construction of new dwelling units on sites which have or are projected to have unacceptable noise exposure, or are in runway Clear Zones or incompatible / not recommended uses in Accident Potential Zones;

3. Encouragement of modernization efforts for existing buildings in noise environments; and

4. Grants and allowances to state and local governments to provide acoustical privacy in multifamily dwellings through building design and acoustical treatment.

Generally, external noise exposure within Noise Zone 3 (as identified in an installation’s AICUZ Study is considered unacceptable without exception and within Noise Zone 2 exposure is normally unacceptable with respect to new construction. HUD funds may also be available to encourage noise abatement planning and acoustical treatment for proposed and existing incompatible / not recommended land uses within the AICUZ.

HUD may fund residential construction within certain noise contours, provided sound attenuation is accomplished. The added construction expense of sound attenuation, however, may make siting in these noise exposure areas financially less attractive. Since the HUD policy is discretionary, variances may also be permitted, depending on regional interpretation and local conditions. HUD also has a policy (24 CFR 51D) that prohibits funding for projects in runway Clear Zones and Accident Potential Zones, unless the project is compatible / recommended with any applicable AICUZ recommendations.

Endangered Species Act
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. ESA provides a platform for the protection of critical habitat and species that may be at risk of extinction.

Section 7 of the ESA, called Interagency Cooperation, provides the mechanism to ensure that actions taken by federal agencies do not jeopardize the existence of any listed species. As required by Section 7, federal agencies must consult with the USFWS when any action the agency funds, authorizes, or carries out may affect a listed endangered or threatened species. Section 7 consultation is the main way that federal agencies manage takings of species.
The ESA 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 a variety of permits for the removal of an endangered or threatened species (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 (HCP) must accompany an application for an incidental take permit. The HCP 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 Migratory Bird Treaty Act are listed in 50 CFR 10.13.

As authorized by the Migratory Bird Treaty Act, USFWS 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).

**Recovery Credit System**

The Recovery Credit System (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.

There are no federally-listed plant or animal species known to occur at Dyess AFB.

**Federal Land Policy and Management Act of 1976**

The Federal Land Policy and Management Act (FLPMA) established the authority for public agencies that possess public lands to manage and plan according to national and local interests. The law mandates that public lands identified for development shall uphold and protect the scientific, scenic, historical, ecological, environmental, and other values unique to specific geographies. This law provides the impetus for the various resource management plans developed and prepared for public agencies.

**Federal Aviation Act**

The Federal Aviation Act was enacted 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 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 Federal Aviation Administration (FAA) was created as a result of the Act and serves 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 / recommended use based on the height of proposed structures or natural features relative to their distance from the ends of a 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 FAA Internet site at http://www.faa.gov/.

As of January 29, 2013, the main focus of Part 77.17 is to establish standards 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; see Figure 3-6 for an illustration of this portion of the FAA Part 77 Vertical Obstruction Compliance.
- 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.

- The surface of a takeoff and landing area of a civilian airport or any imaginary surface established under 77.19, Department of Defense (DOD): 77.21, and heliports: 77.2. However, no part of the takeoff or landing area itself will be considered an obstruction.

- Except for traverse ways on or near an airport with an operative ground traffic control service furnished by an airport traffic control tower or by the airport management and coordinated with the air traffic control service, the standards of paragraph (a) of this section apply to traverse ways used or to be used for the passage of mobile objects only after the heights of these traverse ways are increased by:
  
  - 17 feet for an Interstate Highway that is part of the National System of Military and Interstate Highways where overcrossings are designed for a minimum of 17 feet vertical distance.
  
  - 15 feet for any other public roadway.
  
  - 10 feet or the height of the highest mobile object that would normally traverse the road, whichever is greater, for a private road.
  
  - 23 feet for a railroad.
  
  - For a waterway or any other traverse way not previously mentioned, an amount equal to the height of the highest mobile object that would normally traverse it.

The FAA has identified certain imaginary surfaces around runways to determine how structures and facilities are evaluated and identify if they pose a vertical obstruction relative 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 runway classification.

**Federal Aviation Administration Order JO 7110.65T**

The FAA Order JO 7110.65T became effective in February 2010 and set the provisions for the safe fuel jettisoning or dumping for aircraft. This order established rules for pilots operating in IFR and VFR conditions to dump fuel in certain situations such as emergency situations. This order delineates the means for which fuel dumping should safely occur. This is in response to ensure the safety of the general welfare of the public and the structural integrity of the aircraft during landing operations.

**National Environmental Policy Act**

The National Environmental Policy Act (NEPA) of 1969 is a federal law establishing a US national policy to promote the protection and enhancement of the environment and requiring federal agencies to analyze and consider the potential environmental impact 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, requiring a federal permit, or occurring on federal property 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, an action may not cause a significant impact, whereby an agency is only required to prepare an Environmental Assessment (EA).
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. Public hearings are required for all EIS documents released under NEPA. NEPA requires publishing a draft EA and subsequent Finding of No Significant Impact (FONSI) and allowing public comment for a period of 30 days. An EA may result in a FONSI or Record of Decision concluding that the action will have a significant impact and an EIS is required. The information obtained by the EA / EIS is valuable in planning coordination and policy formation at the local government level.

NEPA mandates that the military analyze the impact of its actions and operations on the environment, including 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.

**National Pollutant Discharge Elimination System**

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 a NPDES permit, but industrial, municipal, and other facilities must obtain permits if their discharges go directly to surface waters.

**Noise Control Act of 1972**

The Noise Control Act of 1972 identified 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 the impacts from encroaching urban development located 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 and the AICUZ program are 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.

**National Historic Preservation Act of 1966**

The National Historic Preservation Act (NHPA) of 1966 requires federal agencies to consider the effects of a proposed project on properties listed in, or eligible for listing in, the National Register of Historic Places. Because no specific action is being proposed as part of this planning process, the review of cultural resources is focused on the identification of existing resources and not potential effects that would result from a specific proposed action.

**Partners in Flight Program**

The DOD has implemented a program entitled Partners in Flight that sustains and enhances the military testing, training, and safety mission through habitat-based management strategies. The program assists natural resource managers in monitoring, inventory, research, and management of birds and their habitats. As part of the Partners in Flight program, a strategic plan is created that can be incorporated into a Bird / Wildlife Aircraft Strike Hazard (BASH) plan. This program reaches beyond the boundaries of the installation to facilitate community partnerships and determine the current status of bird populations to prevent the further endangerment of birds.

**Proposed Protection of Military Airfields from Wind Turbine Encroachment Acts**

Two bills were proposed in late 2016 to protect military airfields from future wind turbine development. On September 28, 2016, Senator John Cornyn from Texas introduced Senate Bill S. 3428 to the US Senate. If passed, the bill would amend the Internal Revenue Code of 1986 to render new wind turbine projects located within a 30-mile radius of an active military airfield or airbase, or DOD air traffic
control radar site, weather radar site, or aircraft navigation aid ineligible for the renewable electricity production credit and the energy credit. A similar bill was introduced into House of Representatives by Congressman Chris Collins of New York. House Bill H.R. 6397 was identical to Senate Bill S. 3428 except that it used a 40-mile radius around an active military airfield or airbase, or DOD air traffic control radar site, weather radar site, or aircraft navigation aids. Neither of these bills were enacted during the 114th Congress in which they were introduced and they expired on January 3, 2017. As of January 2017, both bills have been reintroduced and are under consideration.

**Safe Drinking Water Act**
The Safe Drinking Water Act (SDWA) is the main federal law that ensures the quality of drinking water in the United States. The SDWA authorizes the EPA to set national health-based drinking water standards to protect against both naturally-occurring and man-made water contaminants. The SDWA applies to every public water system in the US.

**The Sikes Act**
The Sikes Act requires the DOD to develop and implement Integrated Natural Resources Management Plans (INRMPs) for military installations. The INRMPs are prepared in cooperation with the USFWS and state fish and wildlife agencies to ensure proper consideration of fish, wildlife, and habitat needs. The Sikes Act requires INRMPs to be reviewed at least every five years by the military and the states. Air Force Instruction 32-7064, Integrated Natural Resources Management, guides the Air Force implementation of the Sikes Act.

**Telecommunications Act of 1996 and the Federal Communications Commission**
The Telecommunications Act of 1996 was the first comprehensive update to federal telecommunication law in over six decades and was in large part intended to open up the marketplace to greater competition. Changes in the means through which information is produced, accessed, stored and shared made the federal government response imperative. The increasing use and development of personal mobile phones, satellite transmission, high speed fiber optics, and other related factors are often pushing demand beyond the system capacity.

New telecommunication tower siting requires compliance with the Federal Communications Commission’s (FCC) environmental review standards and procedures, including NEPA and ESA compliance, National Historic Preservation Act compliance, adherence to any applicable FAA requirements, and structure registration with the FCC. The actual approval of physical installations is subject to state and local permits and approvals; however, state and local authority is limited by FCC law. For instance, states and local jurisdictions cannot base their decisions on any purported environmental effects of radio frequency transmissions.

Telecommunications towers have the potential to cause vertical obstruction issues near Dyess AFB. Requirements for tower placement can help to reduce potential incompatibility / not recommended uses.

**US Avian Hazard Advisory System**
The US Avian Hazard Advisory System (USAHAS) is a geographic information system-based bird avoidance model developed by the US Air Force used for “analysis and correlation of bird habitat, migration, and breeding characteristics, combined with key environmental and man-made geospatial data.” The model provides up-to-date information – “near real-time” – about bird activity and movements to assist pilots and flight planners in the scheduling and use of flight routes. The model can also be used as a forecasting tool to estimate bird strike risk. Information from the North American Breeding Bird Survey, Audubon Christmas Bird Count, bird refuge databases, and the US Air Force Bird-Aircraft Strike database as well as public domain information regarding landfill locations is used to formulate the bird activity and movement data. The model is available for use by agencies and the general public, accessible from the USAHAS website at http://www.usahas.com/.
4.2 Dyess AFB Plans and Programs

The Dyess AFB plans and programs are the specific, existing tools that the installation, in collaboration with the Department of the Air Force, has developed to implement various federal statutes. These plans may be modified based on mission changes or requirements and funding availability, so they are considered semi-permanent programs.

The Dyess AFB plans and programs that are included in this section are:

- Dyess AFB Air Installation Compatible Use Zone Study
- Integrated Cultural Resources Management Plan
- Integrated Natural Resources Management Plan
- Installation Development Plan
- Installation Complex Encroachment Management Action Plan
- Mid-Air Collision Avoidance Pamphlet

Dyess AFB AICUZ

The 2015 Dyess AFB AICUZ Study is an update to the Dyess AFB AICUZ Study completed in 2008. It presents a description of the current noise environment around Dyess AFB and reaffirms the Air Force policy of promoting public health, safety, and general welfare in areas in close proximity to Air Force installations. This study identifies changes in flight operations that have occurred since the 2008 study, and provides current noise zones and compatible / recommended land use guidelines for land areas adjacent to the installation. It is provided as a tool to assist local communities in future planning and zoning activities.

Changes included in the update of the AICUZ Study include:

- Fielding of the C-130J Super Hercules.
- Changes to transient aircraft operations and profiles since the 2008 study.
- Improvements to the computerized noise modeling program NOISEMAP.
- Change in DOD policy to describe an average annual day.

- Potential encroachment issues from increased potential for urban development near the installation.

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 (e.g., 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 (DNL) is a measure of noise commonly used at military installations. The main sources of noise at airfields are flight operations, which include take-offs, landings and touch-and-go operations, and engine maintenance run-ups. The Air Force considers how its operations impact the local community by calculating the 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 five decibel increments.

Accident Potential Zones

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 made up of Clear Zones (CZ), Accident Potential Zone I (APZ I), and Accident Potential Zone II (APZ II). These zones are determined using historical and statistical analysis of all DOD aircraft accidents. APZs typically follow departure, arrival, and pattern flight tracks. The CZ is a square area that extends directly beyond the end of the runway and outward along the extended runway center line.

Height Obstructions

To prevent man-made structures from creating an obstruction that could prevent aircraft from accessing airports or otherwise impact the safety of air navigation, the AICUZ Study provides an overview of height restrictions surrounding the base. Runway airspace imaginary surfaces are the result of the application of obstruction height criteria to Dyess AFB airfield.
Dyess AFB has additional height obstruction limitations above and beyond those that exist at most air installations. These limitations are driven by an on-base aerial Drop Zone and the rising terrain to the south of the installation. A specific minimum elevation is established for the Drop Zone approach and departure corridors. Vertical penetrations into the floor of these corridors would limit airlift training conducted by the squadrons at Dyess AFB.

### Integrated Cultural Resources Management Plan

DOD Instruction 4715.3 and Air Force Instruction (AFI) 32-7065 require military installations to develop an Integrated Cultural Resources Management Plan (ICRMP) as an internal compliance and management tool integrating the entirety of the cultural resources program with ongoing mission activities. The ICRMP includes historic preservation laws, information to determine the significance of cultural resources, an inventory of cultural resources found on base, and steps to take for the discovery of additional significant resources. It also outlines requirements for maintenance and treatment of historic properties.

Five prehistoric, two historic, and one prehistoric and historic era archeological sites have been recorded at Dyess AFB. The base also consults with the six federally-recognized tribes that are affiliated with the lands of Dyess AFB to identify any related cultural resources. Future cultural and historical resource management at the base includes monitoring the base for new discoveries and the mitigation impacts on current historic properties.

Dyess AFB last updated its ICRMP in September 2012.

### Integrated Natural Resources Management Plan

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 Integrated Natural Resources Management Plan (INRMP) document for military installations. To guide natural resource management efforts on-installation, Dyess AFB maintains an INRMP, most recently updated in August 2011.

The Dyess AFB INRMP was created to support present and future mission requirements while promoting ecological integrity and biological diversity in compliance with federal, state, and local standards. The plan includes an overview of the general environment at Dyess AFB, mission impacts on natural resources, natural resource program management, and management goals and objectives. Natural resource management at Dyess AFB is focused on improving storm water quality, capture, and conservation, sustaining and enhancing native species diversity through best management practices. The INRMP goals and objectives must be given consideration early in the planning process for projects and mission changes on Dyess AFB.

### Installation Development Plan

The 2015 Dyess AFB Installation Development Plan (IDP) provides a developmental path forward that incorporates current and future mission requirements, development constraints and opportunities, and recommended courses of action to achieve optimal use of lands, facilities, and resources in support of installation performance. The IDP is intended to guide future development decisions, including consolidations, new construction, and realignments as mission changes occur. Goals were established to help guide development, including:

- Achieve optimum land use planning.
- Protect and enhance the natural infrastructure by making optimal use of the latest developments in environmental protection, energy-efficiency, and sustainable design.
- Plan for facilities maintainability.
Installation Complex Encroachment Management Action Plan

The Installation Complex Encroachment Management Action Plan (ICEMAP) is an internal Air Force plan that evaluates 13 encroachment challenges identified by Air Force Instruction (AFI) 90-2001. The plan then develops actions to mitigate any concerns identified by the evaluation. The 2014 Dyess AFB ICEMAP provides the installation commander with strategies to address current encroachment challenges and minimize the likelihood for future encroachment.

The ICEMAP consists of Volumes I and II and a Community Brochure. Volume I is the action plan for mitigating or preventing encroachment challenges. Volume II is a reference guide, which provides all the background data and analysis. The Community Brochure is to be used as a tool for community education and outreach. Only the Community Brochure is approved for public distribution.

Mid-Air Collision Avoidance Pamphlet

Dyess AFB Flight Safety prepared a pamphlet to increase awareness of military operations and reduce the potential for mid-air collisions. It includes information on highly utilized military operating areas, low level training routes, and other military air corridors surrounding Dyess AFB. The pamphlet has sections for local airspace, mid-air collision avoidance techniques, pilot reaction time, the Dyess AFB mission, Dyess AFB aircraft, and map of the airspace surrounding Dyess AFB.

4.3 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 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 / recommended 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, municipalities can adopt Airport Hazard Area zoning regulations that are not limited to the 1.5 by five 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.

In 1996, the Abilene City Council adopted a resolution that approved the formation of the Abilene-Buffalo Gap-Taylor County-Jones County Joint Airport Zoning Board in accordance with Chapter 241. This Board was made up of two members appointed by each jurisdiction and one member elected by the board members to serve as chairperson of the board, for a total of nine members. At the time this JLUS was written, the Joint Airport Zoning Board was not active. However, the Abilene Airport Zoning Ordinance was developed in 2009 and regulates land uses in the
Airfield safety zones and vertical obstructions around the airfield.

**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 / recommended use 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 / recommended 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 Abilene, 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 / recommended 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 / not recommended 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. In order for this to be added to real estate disclosures in Texas, an amendment to Texas Property Code 5.0008 would have to be enacted at the state level.

**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 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]). 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.

### 4.4 Regional Planning Tools

Regional planning is conducted by the West Central Texas Council of Governments. West Central Texas Council of Governments is a political subdivision or governmental unit of the state of Texas serving the 19 counties, including cities and other districts, of Brown, Callahan, Coleman, Comanche, Eastland, Fisher, Haskell, Jones, Kent, Knox, Mitchell, Nolan, Runnels, Scurry, Shackelford, Stephens, Stonewall, Taylor and Throckmorton in a rural area encompassing 18,000 square miles.

The council addresses issues such as regional planning, economic and community development, hazard mitigation and emergency planning, aging services, water use, pollution control, law enforcement training, youth and community programs, and transportation planning. The council plans, assists local governments, and delivers public services, but has no power to tax or to regulate. The Executive Committee is comprised entirely of local elected officials.
Compatibility Tools

The purpose of the West Central Texas Council of Governments is:

...to encourage and assist local units of governments to join and cooperate with one another to improve the health, safety, and general welfare of their citizens and to plan for the future development of the area embraced by the communities within the area; to assist member units in solving current problems and completing capital improvements; and to establish regional coordination and communication to help eliminate monetary waste from duplication and misapplication.

4.5 State of Texas Local Jurisdiction Planning Tools

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.

Comprehensive Plans

While the State of Texas does not mandate that municipalities maintain a master or comprehensive general plan, Chapter §213 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 §213 authorizes a municipality, without limitation, to address future land, transportation, public facilities or other topics in the Comprehensive Plan. It 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."

Zoning

Chapter §211 of the Texas Local Government Code provides incorporated municipalities in Texas to enact zoning regulations within their city limits. The zoning regulations that are adopted must be in accordance with an adopted comprehensive plan, so a comprehensive plan must be developed and adopted prior to enacting zoning. 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 Dyess AFB JLUS 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 the City of Abilene’s ETJ, which is subject to the City’s Airport Zoning Ordinance.

Subdivision Regulations

Subdivision regulation is accomplished through the review and approval of plats. In addition to their incorporated areas, cities in Texas have some 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. Municipalities may only regulate subdivisions in their ETJ if they are authorized by state law, such as the City of Abilene is through its Airport Zoning Ordinance. 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 / recommended land use 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.
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**Legend:**  ■ = The tool exists but does not address land use issue(s) related to military compatibility.  ■ = The tool exists but only partially addresses land use issue(s) related to military compatibility.  ■ = The tool exists and addresses land use issue(s) related to military compatibility.  ■ = The jurisdiction does not employ this tool.  ■ = The jurisdiction does not have legal authority to create this tool.
Building Codes

Building codes are intended to regulate building construction, materials, alteration and occupancy to ensure health, safety and welfare. Building codes can be used to regulate building construction such that it is compatible / recommended 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.

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. 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 (e.g., 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.

4.6 Taylor County

The following is a review of the existing planning tools utilized by Taylor County along with a brief analysis identifying their ability to address land use and military compatibility, and where potential improvements can be made. The following planning tools are evaluated:

- Taylor County Subdivision Regulations

Taylor County Subdivision Regulations

Taylor County established regulations for subdivision plans, street construction, and drainage in August 2006. The regulations were passed to protect property owners from inadequate road construction and drainage, along with inadequate identification for tax purposes. The ordinance does not address any type of military compatibility / recommended land use regarding noise, lighting, safety, etc.

Overall, Taylor County lacks formal land use controls, especially associated with compatibility / recommended land use with Dyess AFB. However, the Texas Airport Zoning Act allows the City of Abilene to enforce airport hazard area zoning regulations outside city limits through extraterritorial jurisdiction zoning, which can assist with future compatibility / recommended land use between unincorporated county areas and Dyess AFB.

4.7 City of Abilene

The City of Abilene is the county seat and largest city in Taylor County. Dyess AFB is located in western Abilene.

The following is a review of the existing planning tools utilized by Abilene along with a brief analysis identifying their efficiency in addressing land use and military compatibility. The following planning tools were evaluated:

- City of Abilene Comprehensive Plan
- City of Abilene Zoning Regulations
- City of Abilene Subdivision Regulations
- City of Abilene Building Regulations

Comprehensive Plan

The 2004 Abilene Comprehensive Plan contains elements outlining land use and development, neighborhoods, community appearance, community facilities and services, natural environment and resources, and economic base. The plan establishes a coordinated set of policies to guide Abilene’s physical development.

The following growth and land use strategies were found to directly help Dyess AFB:

*Strategy 42: Annex areas to the south and west of Dyess Air Force Base and to the south and*
east of Abilene Regional Airport, all as shown on the Future Land Use and Development Plan, as a means for controlling incompatible encroachment.

Strategy 45: Proactively pursue regional land use and resource planning with Taylor, Callahan, Jones, and Shackelford Counties, the City of Tye, and other regional governments, local federal installations such as Dyess AFB, special service districts, local school districts, and affected state and federal agencies.

The Economic Base Element of the plan has a section discussing Dyess AFB. The objective of the section is to support and promote Dyess AFB as a long-term community asset. The following strategies were included to accomplish this objective:

Strategy 18: Prohibit urban expansion into areas that encroach upon the operation of the base. The City should ensure compliance with this effort by controlling development in and around the installation, and annexing areas on the south and west side of the installation.

Strategy 19: Coordinate with Dyess AFB on transportation and land use planning in the base environs to strengthen new programs and new missions at the installation.

Strategy 20: Expand education campaigns directed to local residents that explain the impact the base has on Abilene and the positive effects the military has on the local economy.

Additionally, Abilene has an annexation policy in Appendix A regarding infill, stating:

Scenario B3: Select areas are designated for future annexation to prevent residential development around Dyess Air Force Base and Abilene Regional Airport.

All of these strategies for the city’s future land use are good compatibility tools.

Zoning Regulations
Abilene’s Zoning Regulations are included in Chapter 2 of its Land Development Code and divide the land within the city into 27 base districts and 6 overlay districts. The main body of the ordinance only applies within the corporate limits of Abilene, but the Airport Zoning Ordinance extends into unincorporated areas within the ETJ of the City of Abilene, which cover the Airport Hazard Areas surrounding Dyess AFB and Abilene Regional Airport.

Section 2.3.5.1 of the ordinance establishes Airport Zoning, which is intended to protect health, safety, and general welfare of the public and regulate airport zoning hazard areas and compatible / recommended land uses surrounding airports in the city. The development and establishment of the Airport Zoning Ordinance was a collaborative process between the City of Abilene, Taylor County, Dyess AFB, and property owners within the affected area. The final ordinance was the result of regulations that were coordinated and agreed upon by the cooperating parties. While the AICUZ recommendations were used as a starting point in the process, the ultimate decisions made by the City of Abilene took some of the AICUZ recommendations into consideration, but intentionally does not contain all of them. These decisions were made to accommodate local preferences, quality of life, and desired lifestyle of the community.

Height limitations established by the ordinance include all of the land beneath the approach surfaces, transitional surfaces, horizontal surfaces, and conical surfaces as they apply to Dyess AFB. Land use regulations are also established by the ordinance, which are similar to the recommendations outlined in the AICUZ, however there are some differences, which were agreed upon by all parties that participated in the development of the ordinance. For example, the ordinance allows residential development in APZ I to accommodate local preferences and quality of life, yet this is not recommended in the AICUZ. There are no land use regulations associated with the Dyess AFB noise contours. Noise regulations within the Dyess AFB noise contours were considered for inclusion in the zoning ordinance, but were omitted through a public process in which many of the property owners within the noise contours publicly stated that they accept the risks and impacts associated with noise generated by
Dyess AFB aircraft operations and requested that noise regulations be removed from the ordinance. If any changes or updates to the Airport Zoning Ordinance are considered by the City of Abilene in the future, they will require review and input from property owners of land within the zoning area. This will ensure a collaborative process between the City and the affected property owners.

An Airport Zone Development Permit is required within the Airport Hazard Areas, which is defined as any area of land or water on which an airport hazard could exist. Any allowable home or other primary structure less than 50 feet in height in the APZ I and less than 150 feet in height in the APZ II and beyond is exempt from obtaining an Airport Zone Development Permit. The Planning Director is required to forward any application for a variance or special exception to the Dyess AFB civil engineer for consideration. After reviewing the application, the base civil engineer may make a recommendation to the Board of Adjustment.

Under Section 4.2.7.1 of the city’s Land Development Code (Chapter 4: Site Development Regulations), lighting standards are established. In order to avoid undue glare and light tresspass, all outdoor lighting fixtures are to be fully shielded, except incandescent fixtures of one hundred fifty watts or less or other sources of seventy watts or less. Canopy lighting must be fully shielded. No flickering or flashing lights are permitted. The Board of Adjustment may agree to allow variations from these standards by granting a Special Exception.

The following items concerning military compatibility are based on a review of the zoning regulations:

- Land within the City of Abilene ETJ is located with the Dyess AFB AICUZ safety zones and noise contours.
- Some of the land use restrictions are not consistent with the land use recommendations provided by the AICUZ.
- The zoning ordinance does not provide sound attenuation standards to further protect the community from military operations.
- The omission of noise and sound attenuation regulations in the zoning ordinance is a result of the acceptance of noise by the residents within the noise contours and the desire to not have this included as part of the ordinance.

**Subdivision Regulations**

The City of Abilene enforces their subdivision regulations through Chapter 3 of the Land Development Code. The subdivision regulations were adopted in 2010.

The current subdivision regulations for the City of Abilene outline requirements for the subdivisions of land to ensure orderly, efficient, and coordinated development. These terms apply to all land within the city limits and all unincorporated land within the ETJ.

Subdivision regulations can help to protect Dyess AFB from incompatible / not recommended development early in the development process by regulating items such as lot size, street lights (downward facing lights), etc. However, Abilene’s subdivision ordinance does not specifically call out protections for Dyess AFB when subdividing land within the installation proximity. The ordinance does not specifically address any type of military compatibility / recommended uses regarding concerns such as lighting and lot size.

**Building Regulations**

The City of Abilene has adopted the following building codes:

- 2012 International Building Code
- 2012 International Residential Code
- 2012 International Existing Building Code
- 2012 International Plumbing Code
- 2012 International Mechanical Code
- 2012 International Fuel Gas Code
- 2014 National Electrical Code
- 2012 International Energy Conservation Code
- 2009 International Fire Code
- Minimum Standards for Buildings and Structures (Chapter 8, Article VI, Division 6 of the City of Abilene Code of Ordinance)(Nov. 6th 2013)

Several of the international codes have been amended by the city to better apply to unique local conditions. There have been no amendments made to address military compatibility or sound attenuation.
4.8 City of Tye

The City of Tye is located in Taylor County. Dyess AFB is located south of the City of Tye.

The following is a review of the existing planning tools utilized by Tye along with a brief analysis identifying their efficiency in addressing land use and military compatibility and where potential improvements can be made. The following planning tools were evaluated:

- City of Tye General Plan Report
- City of Tye Zoning Ordinance
- City of Tye Subdivision Ordinance
- City of Tye Building Regulations

**General Plan Report**

The City of Tye’s General Plan Report was created in 2004. It breaks the land within the city and its ETJ into 10 Planning Districts for ease of gathering data to develop the Plan. Tye’s General Plan recognizes the importance of Dyess AFB to the city and the region and acknowledges that the noise zones and accident potential zones identified in the AICUZ are constraints for future development and that new residential uses should avoid being built in these areas. The noise zones and accident potential zones are included on one of the maps within the General Plan to identify their locations and how they overlay portions of the city. While the General Plan acknowledges and references the AICUZ as an important document to utilize when assessing future development patterns, it also identifies that following AICUZ recommendations in some areas may detract from the city’s character and may limit the city’s future development opportunities within the safety zones and noise zones. The General Plan does not have specific policies for incorporating AICUZ recommendations into the planning review process.

**Zoning Ordinance**

The City of Tye adopted a zoning ordinance in 2006, separating the city into eight zoning districts. Lot size requirements, lot area, density, and height regulations and permissible uses are detailed under district regulations. The ordinance does not include a stand-alone district or overlay for airport or military zoning.

The ordinance establishes maximum heights for each district. The Mobile/Modular Home District allows a maximum height of 20 feet. The Single-Family Residence District allows a maximum height of 30 feet. The Multi-Family Residence and Local Business Districts allow a maximum height of 40 feet. The Agricultural Open Space District allows a maximum height of 45 feet. The General Business District allows a maximum height of 125 feet. The Light Industrial and Heavy Industrial Districts allow a maximum height of 100 feet.

There are various zoning districts that allow height maximums that may interfere with the air missions at Dyess AFB due to the fact that tracts of the city are located within Dyess AFB safety zones.

The height regulations established by the ordinance do not apply to television and radio towers, church spires, belfries, monuments, tanks, water and fire towers, stage towers or scenery lofts, cooling towers, ornamental towers, and spires, chimneys, elevator bulkheads, smokestacks, conveyors, and flagpoles. With these exceptions, the proximity of tall towers to Dyess AFB can have impacts on flight operations.

A review of the Zoning Ordinance reveals the following areas of interest related to military compatibility:

- There are no provisions related to military compatibility / recommended land uses, e.g. noise, vibration, or height.
- The zoning regulations do not require the delineation of noise contours on official city maps or plan submittal maps, as applicable.

**Subdivision Ordinance**

The City of Tye enforces their subdivision regulations through Chapter 10 of the City Code of Ordinances. The subdivision ordinance was adopted in 2006.

The current subdivision regulations for the City of Tye outline requirements for the development, layout, design, and public review of subdivisions of land. These terms apply to all land within corporate city limits and all unincorporated land within the one-half mile ETJ.

Subdivision regulations can help to protect Dyess AFB from incompatible / not recommended development early in the development process. However, the subdivision ordinance does not specifically call out
Building Regulations

The City of Tye has adopted the following building codes:

- 2003 International Building Code
- 2003 International Residential Code
- 2003 International Plumbing Code
- 2003 International Mechanical Code
- 2003 International Fuel Gas Code
- 2003 International Fire Code

There have been no amendments made to address military compatibility or sound attenuation.

4.9 Other Resources

In the interest of land use compatibility / recommended use between the military and the local community, the DOD Office of Economic Adjustment (OEA) and other public interest groups, such as the National Association of Counties (NACo), have prepared educational documents and videos that educate and inform the public about encroachment issues and methods that can be used to address existing or future compatibility concerns. Five resources that have been published to inform the public on land use compatibility / recommended uses:

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 / recommended 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/.

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 the vicinity. This video can be accessed on the official OEA YouTube channel at: http://www.youtube.com/watch?v=6UiyWDgLeJM.

*Managing Growth, Communities Respond, OEA*

This video highlights the lessons learned from three communities (Kitsap Naval Base in Bangor, Washington; Fort Drum in Jefferson County, New York; and Fort Leonard Wood in Pulaski County, Missouri) that have successful programs for managing growth near their respective military installations. This video can be accessed on the official OEA YouTube channel at: http://www.youtube.com/watch?v=rea6d3bDp3c.
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5.1 Compatibility Assessment

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

A number of factors assist in determining whether community and military plans, programs, and activities are compatible / recommended or in conflict with joint land uses such as community activities and military installations. For this Joint Land Use Study (JLUS), 24 compatibility factors were used to identify, determine, and establish a set of key JLUS compatibility issues. These compatibility factors are:

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An action undertaken by either the military or community that minimizes, hinders, or presents an obstacle to the action of the other is characterized as an issue. Issues arising on the part of either or both the military and community are grouped according to the relevant factor and listed in this chapter. For each identified issue, a compatibility assessment is provided discussing the nature and cause or source of the issue followed by applicable existing tools currently used or that may be used to mitigate encroachment or prevent the emergence of encroachment in the future, including an assessment of their effectiveness.

It is important to note that throughout the Dyess AFB JLUS process, property owners in the unincorporated View / Caps Community to the south and west of Dyess AFB were very involved and invested in the JLUS process and development of the study. As property owners in the areas affected by safety (clear zones and accident potential zones) and noise generated by aircraft operating at Dyess AFB, these citizens were influential in the assessment of the JLUS compatibility issues, particularly regarding safety and noise. While it is part of the JLUS process to identify and assess existing conditions (e.g., noise from aircraft operations that goes outside of the boundaries of Dyess AFB), the current View / Caps property owners have publicly stated that they do not have any concerns with safety or noise, and they accept the levels of noise generated by aircraft at Dyess AFB. These property owners are proud to have Dyess AFB as their neighbor and have voiced their continued support for Dyess AFB’s missions.

Methodology and Evaluation

The methodology for the development of Dyess AFB JLUS compatibility issues consisted of a comprehensive and inclusive discovery process to identify key stakeholder issues associated with the compatibility factors. During the beginning phase of the project, a week-long stakeholder interview process took place in which representatives from various stakeholder groups were interviewed to discuss the JLUS process and identify any compatibility issues they felt were existing or could occur in the future. These interviews occurred with representatives from the following stakeholder groups:

- Abilene Chamber of Commerce
- City of Abilene
- City of Tye
- Dyess AFB
- Taylor County
- View / Caps Community property owners
- West Texas Council of Governments

Additional compatibility issues were identified through meetings with the JLUS Policy Committee (PC) and Technical Advisory Committee (TAC), at public workshops, and through technical evaluation and related experience by the project team. While it was not possible to meet with every single stakeholder or property owner in the Study Area, the groups that were interviewed and the attendees of the committee meetings and public workshops served as...
representatives of their respective stakeholder groups to provide input on the issues relevant to their groups.

As a part of the compatibility issue evaluation phase of the project, the PC, TAC, and the public assessed the identified existing and potential future compatibility issues that could impact Dyess AFB missions or the public health, safety, and welfare of the community within the JLUS Study Area and ranked them by how important each issue was to that individual or the stakeholder group that they represented. The results of the compatibility issue activity that occurred at the second public workshop on March 6, 2017 are located in the JLUS Appendix. The evaluation and ranking of issues helped to determine the level of concern that various stakeholder groups had for each identified issue.

The development of strategies (see Chapter 6, Implementation Plan of the JLUS Report) to address compatibility is directly and indirectly affected by the evaluation of issues. The prioritization of issues helped to determine the severity of each issue and its impact on both the Dyess AFB mission and quality of life of the residents and community around the base, and to identify a timeframe in which the issue should be addressed through the strategies developed for the Implementation Plan.

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

- This chapter 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. It is not designed or intended to be utilized as an exhaustive technical evaluation of existing or future conditions within the JLUS Study Area.

- Of the 24 compatibility factors considered, nine were determined to be inapplicable to this JLUS:
  - Air Quality
  - Cultural Resources
  - Dust / Smoke / Steam
  - Frequency Spectrum Capacity
  - Frequency Spectrum Impedance / Interference
  - Infrastructure Extensions
  - Legislative Initiatives
  - Marine Environments
  - Scarce Natural Resources
5.2 Air Quality (AQ)
Air quality is defined by numerous components 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 operations at the installation or in the area.

Findings
There were no issues identified for Air Quality for the Dyess AFB JLUS.
5.3 Anti-Terrorism / Force Protection (AT)

Anti-Terrorism Force Protection (AT / FP) relates to the safety of personnel, facilities, and information on an installation from outside threats. Security concerns and trespassing can present immediate compatibility concerns for installations. Due to current global conditions and recent events, military installations are required to implement more restrictive standards to address AT / FP concerns. These measures include increased security checks at installation gates and physical changes (such as new gate / entry designs).

The Department of Defense (DOD) AT / FP standards require all DOD components to adhere to design/planning criteria and minimum construction standards to mitigate vulnerabilities and threats to an installation and its occupants. Important aspects of these criteria and standards include access control and clear zones around installation perimeters to maintain sight-lines.

Key Terms

**Clear Zones.** Clear zones are areas established around the fence to provide an unobstructed view to enhance detection and assessment around fences. This is different than the term “clear zone” used to describe suggested land use protections around an airfield.

**Fence Line.** The term fence line in this section refers to the perimeter fence around Dyess AFB. Fence lines are often internal to an installation property boundary.

**Sight-lines (lines-of-sight).** This refers to the angles of lines-of-sight from off-installation structures to on-installation structures and vice versa. Lines-of-sight are necessary to maintain an unobstructed view of the installation to ensure that visual access into the installation does not occur where inappropriate, and that necessary lines-of-sight are protected for communications that may have frequency needs.
edge of Dyess AFB. From this road, observers can see into Dyess AFB, including the flightline. However, motorists who stop along FM 707 are more likely to be noticed and raise a concern than people parked at Rister Park. Additionally, Rister Park’s location makes it the closest public property to the flightline for those wanting to look into the base.

Findings

- There is a lack of visual separation between Rister Park and Dyess AFB.
- There are other locations, such as along FM 707, that allow viewing into Dyess AFB, but Rister Park is the closest public property.
- The visual sight-line into the installation may lead to a greater threat concern.

Findings

- Dyess AFB maintains MOAs with the Abilene Police Department, but not the Tye Police Department.
- A lack of formalized coordination with Tye police could limit threat awareness in the region during increased security events.

Terrorism coordination with local communities

Local law enforcement officers have expressed concern with a lack of communication and coordination from Dyess AFB on potential terrorist threats.

Compatibility Assessment

A memorandum of agreement (MOA) is a written document describing a cooperative relationship between two parties wishing to work together on a project or to accomplish an agreed upon objective. A MOA serves as a legal document and describes the terms and details of the partnership agreement. The benefit of an MOA is that it is stronger than a verbal agreement but not a strict as a contract. This allows cooperation with confidence in the other party’s action. The City of Abilene has a number of MOAs with Dyess AFB for information sharing and cooperative use of law enforcement. However, the City of Tye does not have formalized MOAs with Dyess AFB. This creates difficulties in threat situation coordination. Through the JLUS process, the City of Tye’s police chief has increased communication with Dyess AFB security forces but only as an informal good neighborly action. This concern was raised by the Tye Police Department.
5.4 Biological Resources (BIO)

Biological resources include federal and state listed species (threatened and endangered species) and their habitats. These resources may also include areas such as wetlands and migratory corridors that are critical to the overall health and productivity of an ecosystem. The presence of sensitive biological resources may require special development considerations and should be included early in the planning process.

Key Terms

Critical Habitat. Specific areas found to be essential to the conservation of a threatened or endangered species and which may require special considerations or protection. Under this designation, the US Fish and Wildlife Service (USFWS) must review all federal government activities within a designated critical habitat area to ensure that threatened and endangered species are protected.

Endangered Species. Plant or animal species that have a very small population and are at greater risk of becoming extinct. The presence of threatened and endangered species may require special development considerations, could halt development, and could impact the performance of military missions.

Endangered Species Act (ESA). The ESA provides a program for the conservation of threatened and endangered plants and animals and the habitats in which they are found. The lead federal agencies for implementing ESA are the USFWS and the US National Oceanic and Atmospheric Administration (NOAA) Fisheries Service. Species include birds, insects, fish, reptiles, mammals, crustaceans, flowers, grasses, and trees.

Threatened Species. According to the ESA a threatened species is “any species which is likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range.”

ISSUE BIO-1

Texas horned lizard

The Texas horned lizard is a state threatened species that has been known to live in the JLUS Study Area. Increased populations of this species on Dyess AFB property could result in certain restrictions to base operations, dependent upon the location of the populations.

Compatibility Assessment

Dyess AFB is classified as a Category 1 installation, identifying it as having suitable habitat for the conservation and management of fish and wildlife, including special status species, without conflicting with the base’s mission. There are currently no federally listed threatened or endangered species known to exist on Dyess AFB. Texas horned lizards have historically lived in the area around Dyess AFB, but have declined in population in the past few decades. The Texas horned lizard is the official reptile of the State of Texas and is listed by the Texas Parks and Wildlife Department (TPWD) as a threatened species; however, it is not a federally-listed threatened species. Texas Parks and Wildlife Department regulations prohibit the taking, possession, transportation, or sale of a state-listed species without a permit. Factors that have contributed to the decline of Texas horned lizards include predation, development resulting in loss of habitat, and introduced species such as the fire ant that have reduced populations of harvester ants, the Texas horned lizard’s main food source.

Although not required by the ESA, Dyess AFB strives to protect state-listed species to the maximum extent possible. Base personnel have reported seeing Texas horned lizards occasionally around the base, and if they are found during construction activity, they are properly and safely relocated to an area suitable for their habitat. In some cases, military bases that have a large amount of open space or undeveloped land (typically for large training ranges) can become a refuge for species as the lands around the base are developed. If the Texas horned lizard is added to the federal list of threatened or endangered species in the future, its presence at Dyess AFB could impact base operations or ability to expand facilities. Restrictions
enacted to comply with the ESA could reduce the usability of land where the lizard is found, because the habitat may need to be preserved. Dyess AFB does have some undeveloped land, but it is not likely to become a sole refuge for threatened or endangered species. However, the mere occurrence of them on-base could indicate the base is part of their range and pose restrictions.

The USFWS and TPWD have identified several other federal and state-listed or rare species that are known to occur in Taylor County, but according to the Dyess AFB Integrated Natural Resource Management Plan, none of these species have significant suitable habitat on Dyess AFB, so they are not considered present at Dyess AFB.

**Findings**

- There are no known federally-listed threatened or endangered species at Dyess AFB, but the state-listed Texas horned lizard has been observed on occasion by base personnel.

- Dyess AFB strives to protect state-listed species and habitat to the extent possible without interfering with its mission capabilities.
5.5 Communication / Coordination (COM)

This discussion refers to the programs and plans that promote interagency communication and coordination. Interagency communication serves the general welfare by promoting a more comprehensive planning process inclusive of all affected stakeholders. Interagency coordination also seeks to develop and include mutually beneficial policies for both communities and the military in local planning documents, such as comprehensive plans.

** ISSUE  COM-1 **

**Limited formal communication between Dyess AFB and local communities**

Dyess AFB does not have as strong of a communication link with the City of Tye and Taylor County as it does with the City of Abilene. Dyess AFB has minimal, and no formal, communication with property owners who live or own property in the noise contours and safety zones, or adjacent to the base. Additionally, when Dyess AFB contacts local media about abnormal mission activities, they do not always contact staff and elected/appointed officials in Abilene, Tye and Taylor County.

**Compatibility Assessment**

Public outreach is an opportunity to inform the community about the missions at Dyess AFB and for the community to interact and connect with military personnel. Interacting with and informing the public reinforces that Dyess AFB is part of a larger community, provides a better understanding of the importance and value of the installation, enhances the morale of military members, and helps build community support for the military missions. Effective public outreach must be ongoing and consistent to promote involvement. Maintaining a strong relationship with the public allows for better communication, awareness, and support for future projects and missions changes.

Communication to enhance awareness, as well as address concerns, is a constant and evolving challenge for Dyess AFB and its community partners.

Aircraft operations at Dyess AFB cause noise that can impact land uses outside of the installation. The primary concern is that there is not adequate notification for unusual noise events. Local residents are generally aware of day-to-day operations at Dyess AFB but may be disrupted during times when there is an increase in activity that is out of the ordinary. Such events may include transient aircraft operating/training at Dyess AFB or an increase in Dyess AFB aircraft operations to support mission needs. The lack of notification of increased operational activities and when to expect noise can often increase noise complaints. Conversely, public knowledge of noise events can reduce the number of complaints simply through awareness.

Informing local jurisdictions prior to testing, training, and other special takeoffs to enhance awareness can reduce community concerns. When noise from operations is unusual or unexpected, nearby residents can be unsuspecting of increased noise creating greater annoyance and the potential for complaints that could threaten the operations and mission at Dyess AFB. The base has been successful in alerting the surrounding area through its Facebook page which has over 14,000 followers. The page provides updates on changes in operations that may cause additional noise. Utilizing the Facebook page as a news outlet/source of information for the surrounding communities is a useful tool though local residents may not know of the page or may not have a Facebook account to become a follower. While the Facebook page has over 14,000 followers, many of these are likely to be military personnel or their family members.

Dyess AFB also communicates with local media sources such as KTXS to disseminate necessary information to the public. Dyess AFB communicates with staff at the City of Abilene, though does not communicate with smaller cities/towns. Small cities/towns not having the staff resources like larger cities such as Abilene creates a challenge reaching all of the surrounding jurisdictions. Dyess AFB communicates with local
media in Abilene but not on a consistent basis. A larger amount of information on irregular mission activities are available on the Dyess AFB Facebook page. Dyess AFB also does not notify city staff of atypical mission activities which would allow the city staff to inform the citizens in their jurisdiction.

The Dyess AFB Public Affairs Office (PAO) provides communication materials for local, state, and federal entities, which is sent out to communities and media sources through the base leadership’s office. Outreach tools that are used by the base include different forms of media such as press releases, internet/social media, and a designated phone hotline. Despite the utilization of these tools, stakeholders and the general public engaged during the JLUS process expressed worries about how comments and concerns from the public are handled by Dyess AFB and the mediums used to communicate with stakeholders and the public.

During the course of the JLUS process, as some of the communications concerns were brought up with Dyess AFB base leadership, the 7th Bomb Wing Commander has started to hold informal meetings with local community residents to discuss their concerns and provide a platform for communication. While this has been a positive impact for the community, it will be up to the next 7th Bomb Wing Commander to keep the process going unless it is formalized and a process is enacted to carry this forward through new commanders.

**Findings**

- A lack of formal communication between Dyess AFB and the surrounding communities can sometimes result in concerns from community members when military operations or activities occur that are different than the normal operations they are used to (e.g., late night flights or large amounts of transient aircraft training at Dyess AFB).

- Dyess AFB utilizes a Facebook page that has over 14,000 followers to convey changes in flight schedules or changes that may affect the surrounding communities. While this is a good tool, it only reaches a small percentage of the total population of the community in and around Dyess AFB.

- Dyess AFB utilizes a PAO to prepare official and general communication materials for the local media.

- Dyess AFB does not always communicate with the surrounding jurisdictions on abnormal activities so that they can relay information to their citizens.

- The PAO uses a broad range of both traditional and modern tools to assist in communication.

- Utilizing multiple forms of communication for changes in flight operations will strengthen the relationship between Dyess AFB and the surrounding communities.

- The current 7th Bomb Wing Commander has held several informal meetings with local property owners to discuss issues and concerns, but the future Wing Commander may not do the same if no formal process is in place.

**ISSUE COM-2**

New property buyers in the region may not be aware of Dyess AFB operations

New property buyers in the region around Dyess AFB may not be aware that they are purchasing property in an area that may be impacted by Air Force operations, and how the operations may impact their quality of life, such as by the generation of noise or vibration.

**Compatibility Assessment**

Prior to the transfer of real property to a new owner, real estate disclosures require sellers and their agents to disclose certain specified facts (e.g., hazard areas, existing easements) related to the condition of the property. The purpose of real estate disclosure is to protect the seller, buyer, and sales agent from potential litigation. Disclosures can be one of the most practical and cost-effective land use compatibility tools for properties near a military base because they inform buyers of the possible effects (noise, light, etc.) on land.
proximate to a military installation prior to considering a purchase.

While some states require a real estate disclosure for property located within a certain distance of a military installation, Texas does not require this. This would require legislative action at the state level, which has been attempted in the past, but members of the real estate community have fought passage of this legislation. Real estate disclosure of the proximity to a military installation and potential impacts from military activities would be beneficial for purchasers not familiar with the area, but some sellers and real estate agents feel that disclosing the proximity of a military installation may result in a purchaser looking elsewhere to purchase.

The 2015 Dyess AFB AICUZ recommends local communities implement real estate disclosures to individuals purchasing property within Noise Zones and Accident Potential Zones. Current residents in noise zones surrounding Dyess AFB have an awareness of the noise associated with the installation. The real estate disclosures could include noise or other proximity impacts associated with property near a military installation or operations area. Current residents in the area surrounding Dyess AFB are aware of the noise caused by the installation. New property buyers in the area may be unaware of the amount of noise produced by Dyess AFB operations.

In February 2017, a proposed bill was submitted to the Texas State Legislature (Texas House Bill 797) that would amend Chapter 397 of the Texas Local Government Code to add a statement to real estate disclosures to identify if a property is located near a military installation and may be affected by high noise or other operations resulting from activities at the installation. At the time this JLUS was written, the proposed legislature was not approved or adopted.

Findings

- The State of Texas does not require real estate disclosures for effects of military activities for properties near military installations.

- Real estate disclosures can be a low-cost method of informing new buyers of potential effects caused by military operations for properties around Dyess AFB.

- A proposed bill was introduced in the Texas State Legislature that, if approved, would require a seller to disclose that the property is located near a military installation and may be affected by high noise or other operations resulting from the installation.
5.6 Cultural Resources (CR)

Cultural resources are an aspect of a cultural system that is valued by or significantly representative of a culture or contain significant information about a culture. A cultural resource may be a tangible entity or a cultural practice. Tangible cultural resources are categorized as artifacts, records, districts, pre-contact archaeological sites, historic archaeological sites, buildings, structures, and objects. Historic properties are cultural resources that are eligible or listed on the National Register of Historic Places. Cultural resources may prevent development, require development constraints, or require special access by Native American tribal governments or other authorities.

The protection of prehistoric and historic resources is provided through the National Historic Preservation Act (NHPA) as a means to protect historical and cultural items within the United States. The NHPA addresses the preservation of cultural resources including cultural landscapes, traditional cultural properties, sacred sites, and historic and archaeological resources. Documentation of cultural resources and NHPA compliance activities must be coordinated through the State Historic Preservation Office (SHPO).

Cultural resources typically take one of four forms: archaeological, historical, architectural, or traditional cultural properties. Archaeological resources are considered material remains of past human life or activities that provide scientific or social insight into past human cultures. Architectural resources are structures including standing buildings, bridges, dams, canals, etc. of historical, architectural, or engineering significance. Traditional cultural properties are places where associations with cultural practices or beliefs of a living community occurred in the past or are presently occurring.

Special considerations must be made for any development or expansion of military mission activities within areas of cultural significance or sensitivity.

Findings

There were no issues identified for Cultural Resources for the Dyess AFB JLUS.
5.7 Dust / Smoke / Steam (DSS)
Dust results from the suspension of particulate matter in the air. Dust and smoke can be created by fire (controlled or prescribed 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).

Findings
There were no issues identified for Dust / Smoke / Steam for the Dyess AFB JLUS.
5.8 Energy Development (ED)

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

The moving blades of a wind turbine create a Doppler effect that can interfere with radio transmissions between air traffic controllers and aircraft and other types of communications, such as satellites. Recent reports and studies, such as the 2006 Report to the Congressional Defense Committees on The Effect of Windmill Farms On Military Readiness and the Federal Aviation Administration’s (FAA) 2015 A Case Study of Wind Farm Impact on ASR-11 With Focus on Abilene Air Traffic Radar, identify that large numbers of wind turbines located as far as 30+ nautical miles away from a radar system can have a negative impact on the system and interfere with readings. The impacts on radar can vary based on the height, number, and clustering of turbines, and their distance from the radar equipment. The greatest impact is caused by their location proximate to the radar system. Although research is still being conducted, it is not fully known how tall, large, or how many wind turbines must be present to compromise radar operations.

Relative to solar energy, solar facilities could cause substantial amounts of glare depending on their type, location, angle and direction, resulting in a reduction of a pilot’s view, even at a very high altitude.

Key Terms

**Alternative energy.** The term alternative energy is applied broadly to energy derived from nontraditional sources (e.g., solar, hydroelectric, wind).

**Doppler shift.** Doppler shift, also known as the Doppler Effect, is a phenomenon, observed for sound waves and electromagnetic radiation, characterized by a change in the apparent frequency of a wave as a result of relative motion between the observer and the source.

**Radar clutter.** Radar clutter refers to unwanted signals, echoes, or images on the face of the display tube which interfere with observation of desired signals.

**Screening.** Screening is the blocking out portions of the “field of view” so that aircraft control instrumentation and/or personnel cannot see aircraft that fly behind the “screen.”

### ISSUE ED-1

**Wind turbine development**

Wind turbine development has occurred in the region around Dyess AFB, and more is anticipated in the future. Wind farm development can have several impacts on mission operations at Dyess AFB including causing vertical obstructions and degrading radar performance.

**Compatibility Assessment**

Future commercial wind energy presents a potential threat to Dyess AFB operations, despite its clean energy benefits. The presence of large, commercial wind farms presents challenges to flying missions such as vertical obstructions, radio frequency (RF) interference, and radar cluttering. Radio frequency clutter sources, such as wind turbines, have the potential to affect the accuracy of radar signals from the rotating turbine blades, inducing undesired Doppler shift on the radar signal. Doppler shift occurs when wind turbines reflect radar waves which cause blind spots or false reads. Each wind turbine creates an anomaly on the radar that makes it appear an aircraft is in the area. The geographic dispersion of wind towers can also affect radar signals. If they are spaced too close together, it can result in a longer single radar signature. The concentration of wind turbines can also block the field of view of radar equipment, causing a screen or barrier that the radar cannot see through to the other side. Wind farms heighten this effect due to the increase in density of wind turbines.

Wind turbines and wind farms can also create vertical obstruction concerns if erected near flight patterns used by military aircraft, or within the imaginary surfaces associated with an airfield. As wind energy technologies have improved, the average height of new-build wind turbine towers has increased. The average height of new turbine models being built is over 500 feet in order to capture better wind to be more efficient. Aircraft operating at Dyess AFB
sometimes fly low-level flight routes, which allow flights below 500 feet. There are many important Military Training Routes throughout Texas that allow flight at lower than 500 feet, but these are outside the Study Area of the JBUS and are not evaluated in this report. However, imaginary surfaces for Dyess AFB’s runways require land to be clear of vertical obstructions to allow safe operations of aircraft. The imaginary surfaces are described in more detail in Section 5.23 Vertical Obstructions.

The FAA considers any structure over 499 feet to be an obstruction to navigable airspace. For proposed structures over 499 feet in height, a study must be conducted to determine any actual impacts to navigable airspace, based on locations of nearby airports / airfields, air traffic patterns, and similar factors. While aircraft operating at Dyess AFB have workarounds for their flight paths for existing wind farms in the region, development of new wind farms may impact their ability to carry out their mission, depending on the location of the farms in relation to approach and departure corridors and flight paths.

Primary air traffic radar operations for Dyess AFB are conducted at Abilene Regional Airport using the airport’s Airport Surveillance Radar model 11 (ASR-11). The ASR-11 is the FAA’s newest terminal radar and covers 60 nautical miles of range to an altitude of 24,000 feet. It is equipped with a Primary Surveillance Radar that relies on aircraft to reflect a strong pulse of radiation to be tracked in the system. It also has a Monopulse Secondary Surveillance Radar that relies on aircraft to have functional transponders to send replies back to the radar. The Monopulse Secondary Surveillance Radar is less likely to be impacted by wind turbines as it received information from a transponder within an aircraft, but only if the aircraft is equipped with a transponder.

Most types of large-scale wind development have the potential to affect radar operations at Abilene Regional Airport and Dyess AFB due to the spinning blades of the wind turbines causing interference and false reads on the radar equipment that make it appear that there are aircraft or objects operating in the area that are not there, or by blocking the signal of the radar from obtaining an accurate measure of the area on the other side of the turbines. This impact depends on the height of the wind turbines, the distance from the air traffic radar and its operational areas, and the density of the turbines. Typically, large commercial wind farms cause interference due to the large densities of turbines causing a greater cumulative footprint of interference. Individual turbines are generally not a concern provided they are not within the approach and departure corridors and are less than 199 feet tall.

There are seven commercial wind farms in the radar coverage approximately within 30 nautical miles around Dyess AFB and Abilene Regional Airport. Lone Star I and II are located to the northeast of Abilene. Lone Star I has 22 wind turbines and Lone Star II has 55 wind turbines. Trent Mesa is located between Sweetwater and Abilene and has 100 wind turbines. Buffalo Gap II is located southwest of Abilene, with 155 wind turbines. Buffalo Gap III is located southeast of Sweetwater, with 74 wind turbines. Callahan Divide is located southwest of Abilene and has 76 wind turbines. Horse Hollow is located southwest of Abilene, with 421 wind turbines. Figure 5.8-1 shows existing wind farm development around Dyess AFB and a generalized overlay of Dyess AFB flight patterns to identify flight concerns. There are three wind turbines that penetrate the imaginary surfaces of Dyess AFB’s airfield and cause vertical obstructions for flight operations. The imaginary surfaces and impacts from vertical obstructions are further discussed in section 5.23 Vertical Obstructions.

As of September 2016, within the entire State of Texas, there was an installed wind power capacity of approximately 18,531 megawatts (MW). From 2014 to 2016, energy production from wind energy in Texas increased by approximately 3,500 MW, with an additional 5,000 MW under construction. Texas has an estimated total potential wind capacity of 1.3 million MW. The propensity for wind energy coupled with land availability may lead to additional wind farm development around the state. Any future large-scale wind development within areas used by military aircraft for low level flights, such as approach and departure corridors or low-level Military Training Routes, or that interfere with air traffic control radar would likely impact the military’s ability to carry out its missions. Specific impacts to the mission would depend on factors such as number of turbines, heights, and distances from military operating areas or radar equipment.
Figure 5.8-1
Existing Wind Farms Around Dyess AFB

Legend
- Wind Turbine
- Flight Patterns
- Dyess Air Force Base
- County
- Community Covered by JLUS
- Tye Extraterritorial Jurisdiction
- Abilene Extraterritorial Jurisdiction
- Other Community

Source: Dyess AFB 2013 AICUZ. USGS 2014.
Compatibility Assessment

The US Department of Energy’s Wind Program and the National Renewable Energy Laboratory (NREL) developed wind resource maps to determine potential for wind energy development in each state. This information is shown on Figure 5.8-2 for wind resource potential around Dyess AFB at a height of 80 to 140 meters (262.5 to 459.3 feet), the typical range of heights of modern and new wind turbines. Areas with annual average wind speeds of roughly 6.5 meters (21.3 feet) per second and faster at 80 meters (262.5 feet) above the ground are typically considered to be suitable for wind energy development. The 2014 industry standard for wind tower heights generally range from 80 to 110 meters (262.5 to 360.9 feet) in height; however, new technology options are estimated to increase the heights of wind turbines to 140 meters (459.3 feet) as a common height.

As shown on Figure 5.8-2, most of Texas was broken up into 400 square kilometer (sq. KM) sections. Each section shows land area with a gross capacity factor of 35 percent and higher that may be suitable for wind energy development. Each section is identified by the amount of sq. KM it has with the potential to produce viable wind energy, measured in ranges of 100 sq. KM. For example, excluding a measurement of 0 for areas with no potential, the smallest increment of wind potential is a section identified as 1 to 100, meaning that between 1 and 100 sq. KM of that land is viable for wind energy development. The highest potential is 301 to 400. The wind potential models are estimates and may differ from the actual wind resources at any given area, which may vary from estimates based on factors such as terrain, buildings, vegetation, and atmosphere effects.

As indicated by Figure 5.8-2, the region around Abilene Regional Airport and Dyess AFB has very good wind energy potential, which has led to the existing wind farms. This region is likely to be attractive to wind developers in the future as well, which could impose greater impacts on Abilene Regional Airport and Dyess AFB operations.

Wind farms are often developed in a layout where wind turbines are built in a series of lines. The distance between individual wind turbines, called gaps, is an important factor to consider to help determine the impact on radar. There are two types of gaps: the mill gap, defines the typical distance between two wind mills on the same line; and the line gap, which defines the typical distance between two lines of wind mills. The following graphic provides an example of the two types of gaps.

![Line gap and mill gap examples](image)

Source: Abbreviated Case Study of Wind Farm Impact on ASR-11 with Focus on Abilene Air Traffic Radar

A small gap between turbines leads to a potential to lose track of aircraft over wind turbines causing an area designated as unreliable for primary radar tracking. With the area around Dyess AFB and Abilene airport being a Class C airspace it is required to track aircraft over the area around both Dyess AFB and Abilene Regional Airport. Table 5.8-1 notes the estimated gap measurements of each wind farm in the Dyess AFB and Abilene Regional Airport radar coverage area, which were derived from Google Earth hand analysis.

<table>
<thead>
<tr>
<th>Table 5.8-1 Wind Farm Gap Distances</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wind Farm</td>
</tr>
<tr>
<td>Lone Star I</td>
</tr>
<tr>
<td>Lone Star II</td>
</tr>
<tr>
<td>Trent Mesa</td>
</tr>
<tr>
<td>Buffalo Gap II</td>
</tr>
<tr>
<td>Buffalo Gap III</td>
</tr>
<tr>
<td>Callahan Divide</td>
</tr>
<tr>
<td>Horse Hollow</td>
</tr>
</tbody>
</table>

Source: Abbreviated Case Study of Wind Farm Impact on ASR-11 with Focus on Abilene Air Traffic Radar
The wind farms southwest of Abilene have a tighter spacing pattern than the farms north of the city, and due to their number, create much larger regions of clutter. The presence of wind turbines can impact the radar functionality and ability to accurately track aircraft near the wind farms if they do not have transponders. However, the radar can be adjusted to block the returns from turbines from the field of view and allow for better functionality and tracking of aircraft. This is mainly due to the “tuning” of the radar system to block those echoes so they will not show up on the radar as a permanent echo return, thus aircraft can be detected without being hidden behind the massive turbines.

In April 2015, the Abbreviated Case Study of Wind Farm Impact on ASR-11 With Focus on Abilene Air Traffic Radar was completed. This study analyzed the effects of wind farms on the Primary Surveillance Radar equipment at Abilene Regional Airport. The study was developed was to test the air traffic control radar effectiveness against wind turbine development near Abilene, TX to see the impact, if any, to the radar system and the air traffic controller’s ability to see aircraft on their radar. This test was set against “primary target only”, meaning that the aircraft electronic signature and transponders were turned off for this test. The result of the test identified that wind turbines do have an impact on “primary targets” in and around multiple wind turbines and wind farms, but do not affect the electronic signature of transponder-equipped aircraft. The Abbreviated Case Study confirms that transponder equipped aircraft are easily seen by the ASR-11 radar system within and above the wind farms.

Wind turbine development has, so far, been manageable for the Encroachment Team at Dyess AFB. Primarily, the wind turbines have been less than 500’ in height, and with a few exceptions, have been built where there would be minimal impact to military aircraft operations. The exceptions mentioned were proposed developments within the instrument approach corridor to runway 34 south of Dyess AFB, and on the mesa southwest of Dyess AFB that could have impacted C-130 operations. Both impacts were prevented by the cooperation with the City of Abilene, Taylor County officials, and Dyess Encroachment personnel.

Other areas of concern are the Military Training Routes (MTR’s). These MTR’s are highways in the sky, like airways flown by commercial aircraft but are located in sparsely populated areas further west of Dyess AFB and in several different states, and are flown at low altitude. For Dyess B-1B training, MTR’s are flown daily as part of the B-1B training curriculum. Vertical development within the MTR corridors could be very detrimental to low altitude training effectiveness and possible safety concerns.

Additionally, the C-130J Hercules mission is extremely diverse. Considered the pickup truck of the inventory, the C-130 can haul just about anything, anywhere.

As of May 2017, the State of Texas is in the process of establishing legislation (Senate Bill 277) that would prohibit tax abatement for new wind farms within 25 nautical miles of a military aviation facility, including Dyess AFB. Once enacted, this legislation will protect Dyess AFB from future wind development within 25 nautical miles of the installation. The State of Texas is among the first states to establish this type of legislation to regulate wind development around military installations. It will play an important role in protecting future impacts to the ASR-11 facility.
Findings

- Abilene Regional Airport provides primary radar operations for Dyess AFB using its ASR-11 radar equipment.

- Large commercial wind farms present challenges to flying missions such as RF interference, clutter, or screening.

- The wind farms southwest of Abilene cause the greatest impact to radar coverage due to the large number of turbines and close spacing.

- Mill and line gaps will determine the effect wind turbines have on flying missions.

- There are seven commercial wind farms in the radar coverage area around Dyess AFB and Abilene Regional Airport, accounting for over 900 wind turbines, some of which are within flight patterns used by Dyess AFB pilots.

- Texas has an estimated total capacity of 1.3 million MW of wind energy potential, which coupled with land availability around the state is a good indicator that future wind farm development will occur. Any future large-scale wind development within areas used by military aircraft for low level flights, such as approach and departure corridors or low-level Military Training Routes, or that interfere with air traffic control radar could impact the military’s ability to carry out its missions. Specific impacts to the mission would depend on factors such as number of turbines, heights, and distances from military operating areas or radar equipment.

- Wind turbine development has, so far, been manageable for the Encroachment Team at Dyess AFB and there are existing workarounds to address turbine impacts to radar systems.

- As of May 2017, the State of Texas is in the process of establishing legislation (Senate Bill 277) that would prohibit tax abatement for new wind farms within 25 nautical miles of a military aviation facility, including Dyess AFB.
Wind Energy Potential at 80-140 Meters High Around Dyess AFB

Legend

- **Dyess Air Force Base**
- **Community Covered by JLUS**
- **Tye Extraterritorial Jurisdiction**
- **Abilene Extraterritorial Jurisdiction**
- **Other Community**

Potential Wind Capacity At 80-140 Meters:

- 35% Or Higher Gross Capacity (Area - Sq. KM)
- 1 - 100
- 201 - 300
- 301 - 400
- Wind Turbine


Figure 5.8-2

Wind Energy Potential at 80-140 Meters High Around Dyess AFB
Compatibility Assessment

**ISSUE ED-2**

**Solar energy development**

While there is currently no major solar development in the region around Dyess AFB, future solar farms could be built in the region. Depending on the location and types of materials used for solar farm construction, this could have impacts on aircraft operations.

Compatibility Assessment

Reflectivity refers to light that is reflected off of surfaces. The potential impacts of reflectivity are glint (a momentary flash of light) and glare (a more continuous sources of excessive brightness relative to the ambient lighting) which can cause effects such as a brief loss of or blurred vision, or act as a visual distraction. For the purpose of the Dyess AFB JLUS, the primary concern with this issue is if this impact to vision occurs when operating an aircraft. This temporary vision impairment can increase the risk for aircraft mishaps, especially during takeoff or landing. Solar energy facilities could cause glare depending on the type or materials used, location, size, angle, and direction, resulting in a reduction of a pilot’s view. While the amount of glare will vary depending on factors such as time of day, angle of solar panels, elevation of aircraft, and proximity of aircraft to the source of glare, the photo on this page illustrates an example of glare from an aircraft cockpit flying in proximity to a solar farm.

It is the materials used in the construction of the solar panels that are of particular concern for creating glare. Solar panels may be constructed with reflective materials which are meant to assist in the generation and distribution of energy, but can also cause unintended glare for military and civilian pilots. There are also solar technologies that absorb sunlight and do not cause glint or glare. The amount of reflectivity varies greatly among solar technologies with concentrated solar power technologies being highly reflective and photo voltaic (PV) being primarily absorptive. Because solar energy projects introduce new visual surfaces to the airport setting where reflectivity could result in glare that causes visual

impairity on pilots or air traffic controllers, reflectivity requires study during project siting and design. The amount of analysis will depend on site-specific conditions. Single-site solar development, such as residential, is not generally a concern for glare issues due to the small size, but large-scale solar development would cause concerns if developed with materials that cause glare.

**Example of glare from a solar farm experienced from an aircraft cockpit.**

Source: Air Force Flight Test Center 412 Training Wing at Edwards AFB

The State of Texas has experienced an increase of both installed and proposed solar farms in recent years. As of December 2015, 534 MW of solar capacity has been developed in Texas, enough to power approximately 57,000 homes. Over the next five years, it is estimated that approximately 7,753 MW of solar energy development will be installed in Texas. With this increase, Texas will be the second largest state producer of solar energy.

During the JLUS process, there were no specific sites of existing solar development that were identified by Dyess AFB personnel as causing concern for glare. However, any future proposed large-scale solar developments within the JLUS Study Area could cause safety concerns depending on their location, size, and materials used for construction.
Findings

- Large-scale solar energy developments have the possibility to cause glare, causing visual impairment or distractions to pilots.

- Small-scale solar energy developments, such as residential rooftop development, is generally not a concern for glare.

- It is estimated that approximately 7,753 MW of solar energy development will be installed in Texas over the next five years, making it the second largest state producer of solar energy.

- While no specific sites were identified as current concerns for solar energy development glare during this JLUS, future proposed development could cause concerns depending on size, location, and building materials used.
5.9 **Frequency Spectrum Capacity (FSC)**

Frequency spectrum refers to the range of electromagnetic waves capable of carrying signals for point-to-point wireless communications. In a defined area, the frequency spectrum is limited and increasing demand for frequency bandwidth from commercial applications such as cellular phones, computer networking, GPS units, and mobile radios, is in direct competition with the capacity necessary for maintaining existing and future missions and communications on installations.

**Findings**

There were no issues identified for Frequency Spectrum Capacity for the Dyess AFB JLUS.
5.10 Frequency Spectrum Impedance/Interference (FSI)

Frequency spectrum is the entire range of electromagnetic frequencies used for communications and other transmissions, which includes communication channels for radio, cellular phones, and television. In the performance of typical operations, the military relies on a range of frequencies for communications and support systems. Similarly, public and private users rely on a range of frequencies in the use of cellular telephones and other wireless devices on a daily basis.

Findings

There were no issues identified for Frequency Spectrum Impedance/Interference for the Dyess AFB JLUS.
5.11 Housing Availability (HA)
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.

Key Terms
Basic Allowance for Housing. Basic Allowance for Housing (BAH) refers to a monthly military allowance to offset the cost of living granted to military members for providing housing for themselves and their dependents when they do not live in on-base housing. Factors determining BAH include pay grade, location, and number of dependents.

ISSUE HA-1

Housing rental market does not meet the needs of Dyess AFB
The housing rental market in the communities around Dyess AFB does not have an adequate amount of available and appropriate residential properties to meet the needs of the current mission and potential future growth.

Compatibility Assessment
Dyess AFB has 672 privatized military family housing units located on-base, and a dormitory with a capacity of 616 residents. There are roughly 5,000 military personnel stationed at Dyess AFB, of which approximately three quarters reside off-base. In 1990 the rental market had a vacancy of 14.5 percent. An economic boom occurred during the 1990s that lead to an increase in population in the area. By 2000 the rental vacancy fell from 14.5 to 10.6 percent. According to the American Community Survey the vacancy rate in 2015 was 7.8 percent. Dyess AFB military personnel has decreased from approximately 5,300 in 2008 to 4,300 in 2015.

The rental housing market in the region has been very competitive since 2000, with Dyess AFB competing with Abilene Christian University, Hardin-Simmons University, and McMurry University in Abilene for rental housing. An additional amount of rental property is scheduled or under construction. From 2000 to 2005, about 880 new multifamily units were permitted in the Abilene area. Since 2006, an additional 890 new multifamily units were permitted including 60-unit market-rate complex and a 240-unit student apartment complex located between the universities.

Source: Comprehensive Housing Market Analysis 2008

Dyess AFB and the DOD offer tools for incoming personnel to get information on the local community and assist in finding housing before relocating to Dyess AFB. Dyess AFB’s Housing Management Office assists personnel with resources on the community and housing options. This is supported through an online website [www.housing.af.mil/Units/Dyess](http://www.housing.af.mil/Units/Dyess) that provides resources and contact information. There are other websites that provide rental or sales information for military personnel coming to a new area. Military By Owner ([www.militarybyowner.com](http://www.militarybyowner.com)), Automated Housing Referral Network ([www.ahrn.com](http://www.ahrn.com)), and Homes.mil ([www.homes.mil](http://www.homes.mil)) each provide a database of properties that are available for rent or sale to military families and allow the user to search by features such as military installation, cost, location, and property features.

The vacancy rate for housing in Abilene has decreased with the growth of the city’s population and growth at the three universities. During the JLUS process, it was identified that some of the available rental housing in the area does not meet the housing standards used by the Air Force for military family housing. However, through the research conducted during this JLUS to assess this issue, it was determined that the housing rental market to support the current number of Dyess AFB personnel is adequate. If future mission requirements at Dyess AFB result in an increase in military personnel at Dyess AFB, then there could be greater competition for housing in the local market.

Findings
- Dyess AFB military personnel has decreased from 5,300 in 2008 to 4,300 in 2015.
- Dyess AFB military personnel are in competition with three universities for rental housing in the surrounding community.
Dyess AFB’s Housing Management Office assists military personnel and families relocating to Dyess AFB with information on the local community and housing resources.

There are various online tools available to assist military personnel and families in finding homes for rent or sale.

Research conducted during this JLUS found that the rental housing market is adequate to support the current number of Dyess AFB personnel.
5.12 Infrastructure Extensions (IE)

Infrastructure refers to public facilities and services such as sewers, water, electric, and roadways that are required to support development (existing and proposed).

Public facilities and services should be appropriate for the type of urban or rural development they serve, but also limited to the existing and planned needs and requirements of the area. For example, the provision of a safe transportation system, including all modes of transportation (automobile, mass transit, railway, highway, bicycle, pedestrian, air, water, etc.), is an important infrastructure component. Adequate transportation infrastructure contributes to local, regional, and state accessibility.

Infrastructure plays an important role in land use compatibility. Infrastructure can enhance the operations of an installation and community by providing needed services, such as sanitary sewer treatment and transportation systems. Conversely, infrastructure can create encroachment issues if expanded without consideration of the consequences of future development. The extension or expansion of community infrastructure to a military installation or areas proximate to an installation has the potential to induce growth, potentially resulting in incompatible / not recommended uses and conflicts between a military mission and communities. Within comprehensive planning, infrastructure extensions can serve as a mechanism to guide development into appropriate areas, protect sensitive land uses, and improve opportunities for compatibility / recommended uses between community land uses and military missions.

Findings

There were no issues identified for Infrastructure Extensions for the Dyess AFB JLUS.
5.13 Land / Air / Sea Space Competition (LAS)

The military manages or uses land, air, and sea 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 and sea operations can compete for limited air and sea space, especially when the usage areas are in close proximity to each other. Use of this shared resource can impact future growth in operations for all users. While this JLUS assesses land and airspace competition, due to Dyess AFB’s location, there is no sea space competition.

Key Terms

**Unmanned Aerial Systems (UASs).** UASs are aircraft that are capable of operating without an internal pilot; are tethered by a radio control link; and can be preprogrammed for both flight and payload operations prior to launch.

**Technical Background**

The demands of extended operational reach, both in terms of breadth and depth, make the military installation, training area, and airspace of the region more important as requirements and capabilities of weapons and command and control systems continue to improve.

The land, air, and sea spaces used by the military can be owned by the DOD, designated for DOD use by a federal or state agency, provided through easements or other agreements with public or private entities, or maintained as a historic usage right. Public and private requests to share or assume some of these resources may have a negative impact on military training and test objectives.

**Controlled and Uncontrolled Airspace Descriptions**

To help air traffic controllers and pilots deal with varying traffic conditions in the sky, United States airspace is divided into six different classes (A, B, C, D, E, and G). These classes each have different requirements for entry into the airspace, pilot qualifications, radio and transponder equipment, and Visual Flight Rules (VFR) weather minimums.

**Class C Airspace.** Use of Class C airspace requires the use of two-way communication with Air Traffic Control and an operable radar beacon transponder with automatic altitude reporting equipment, which must both be established prior to entering Class C airspace. VFR flights in Class C airspace must have three miles of visibility, and fly an altitude at least 500 feet below, 1,000 feet above, and 2,000 feet laterally from clouds.

<table>
<thead>
<tr>
<th>ISSUE</th>
<th>LAS-1</th>
</tr>
</thead>
<tbody>
<tr>
<td>Future usage of commercial and recreational unmanned aerial systems</td>
<td>As unmanned aerial systems become more available and popular among commercial and recreational users, they may pose safety concerns for flight operations at Dyess AFB.</td>
</tr>
</tbody>
</table>

**Compatibility Assessment**

Use of UASs, commonly called drones for commercial and recreational purposes has increased dramatically in recent years as they have become cheaper, smaller, and easier to operate. The FAA requires UAS pilots to notify both the airport operator and the air traffic control tower for flights within a five-mile radius of an airport. Pilots and air traffic controllers in the US reported about 1,210 incidents in 2015 in which UASs flew too close to airports or aircraft from FAA reported UAS sightings. Technology can be utilized to limit the range of UASs using geofencing, which uses Global Positioning Systems or radio frequency identification to create a geographic boundary that location-aware devices know to avoid. Few manufacturers have incorporated this technology in the drones as it is not required.

The FAA Modernization and Reform Act of 2012 established rules for non-commercial / recreational use of model aircraft. Under these rules, civilian UASs must be operated to ensure that they do not interfere with any manned aircraft. The Act also requires an operator to receive a Section 333 exemption, a “full COA” issued by the FAA, and an executed letter of agreement with the airport sponsor before flying a UAS within five miles of an airport. The operator must also maintain visual line of sight of the UAS. Federal
Aviation Regulation (FAR) Part 107 includes some additional rules for certain types of model aircraft that meet certain criteria such as being flown strictly for hobby or recreational use, weighs less than 55 pounds, and is operated in accordance with a community-based set of safety guidelines. Federal Aviation Administration regulations state that a civilian or commercial user wants to use a UAS within five miles of an airport or airfield, they must coordinate and get prior approval from the airport / airfield operator before conducting such activity.

A recent FAA rule called the Small Unmanned Aircraft Rule (FAR Part 107) went into effect August 29, 2016. Part 107 regulates the use of non-hobby UASs including commercial use. Part 107 also has implemented certain regulations for the non-hobbyist pilots that allow the UASs to be used with operational limitations to maintain safety. These regulations should keep UAS usage low around Dyess AFB as long as users abide by them. These regulations are important because of Dyess AFB’s proximity to residential communities which have the potential to utilize UASs recreationally.

In more rural parts of the US, UASs are becoming increasingly used for agricultural purposes to monitor crops and fields. The UASs can be programmed to fly low over fields and streams providing photos and videos to a ground station where the images can be stitched together into maps and analyzed to gauge crop health. They can also be programmed to land and take soil and water samples. A 2013 study estimated that future UAS markets would be largely in agriculture. There is uncertainty as to whether a farmer who decides to use a personal drone to survey as part of the agricultural business and make a profit would be considered a commercial or recreational use of a UAS.

The FAA conducted an Aerospace Forecast for fiscal years 2016 to 2036 that, among other things, provided an estimation of the future sales of UASs in the United States. The forecast estimated 1.9 million potential annual sales for small UAS hobbyist model aircraft, with an estimation to increase to 4.3 million units sold annually by 2020. For commercial small UASs (non-model aircraft), there was an estimation of 600,000 units sold annually in 2016, increasing to 2.7 million sold annually by 2020. This equates to a total sales forecast for small UASs of 2.5 million annually in 2016, increasing to seven million annually in 2020. This forecast was completed before the final ruling of Part 107, which may affect future sales numbers.

As the number of UASs increases, there is potential for increased communication between air traffic control and civilians utilizing UASs. There will also be the increased risk of UASs flying into restricted airspace without prior coordination or consent. This raises security concerns as many UASs are equipped with camera equipment and could provide a line-of-sight into the base. In addition, UASs can also strike aircraft if they are flown into the flight patterns, causing safety concerns for pilots. Restricted airspace is a no drone zone as stated by the FAA.

Findings

- In rural parts of the US, such as the area surrounding Dyess AFB, UASs are being used for agricultural purposes, which can cause safety concerns for the base.
- The FAA estimated a total sales forecast for small UASs of 2.5 million annually in 2016, increasing to seven million annually in 2020.
- FAR Part 101, Part 107, and FAA Modernization and Reform Act regulate commercial and recreational use of model aircraft and UASs.
- There is a need for awareness of safety hazards regarding use of unmanned UAS near military flight areas.
- The FAA provides strict requirements for operations and coordination of unmanned UAS operations in areas proximate to military airspace.
- There are no recorded UAS collisions in the Dyess AFB and Abilene Regional Airport area.
ISSUE LAS-2

Local private aircraft operating near Dyess AFB
Due to the location of pipelines and agricultural uses in the region around Dyess AFB, private aircraft such as surveyors and crop dusters sometimes fly near the base. Although these aircraft are required to contact the Dyess AFB control tower, this does not always occur, which presents safety concerns between aircraft.

Compatibility Assessment
Interviews with Dyess AFB personnel did not reveal any mishaps (or near miss occurrences) with military aircraft and crop dusters or pipeline surveyors. However, due to the catastrophic nature if such a mishap were to occur and the fact that aircraft used for aerial applications (crop dusting and pipeline surveyors) can operate at low altitudes and with frequent passes in the area, this is a safety concern for Dyess AFB.

There are several pipelines in close proximity to, or that go through Dyess AFB. Pipeline operators are required to maintain assurances of safe operating pipelines and perform routine surveillance of pipelines. This is sometimes done by aerial inspection via a surveillance aircraft. Figure 5.13-1 identifies pipelines near Dyess AFB. If future pipelines are installed in the area around Dyess AFB in the future, it may add to an increase in aerial surveillance of pipelines from aircraft.

Dyess AFB and Abilene Regional Airport both operate in Class C airspace. To fly in this airspace, pilots need to use a radio to communicate with the air traffic control tower and have a transponder in their aircraft.

Farmers or surveyors who operate agricultural / surveying aircraft need to have ongoing detailed coordination with controlling agencies in military airspace to ensure security procedures, responsibilities, and boundaries are established and maintained. Some crop dusting aircraft don’t have radios and their pilots utilize cell phones as a substitution.

During the JLUS process, a representative from the crop dusting community identified an issue that Dyess AFB is not always responsive in a timely manner to coordinate with crop dusting pilots to utilize Dyess AFB-controlled airspace. Agriculture aircraft operations are extremely dependent upon weather conditions such as wind speed, wind direction, in some instances temperature, and the presence of inversions, and sometimes the aerial application of seeds, fertilizers, or pesticides must be done in a timely manner in order to support healthy crop growth. According to the representative, timely coordination and allowance of crop duster flights was much better in the mid-1980s to early 1990s, but in recent years, it has been more difficult for crop dusters to get approved access to Dyess AFB airspace. This has caused some impact to the economic operations of crop dusters and agricultural use in the area around Dyess AFB.

Dyess AFB maintains a Mid-Air Collision Avoidance (MACA) program. The Dyess AFB Flight Safety group developed a MACA pamphlet for local aviators to use to enhance awareness of military operations at and around Dyess AFB to create a safe environment in which to share airspace and avoid collisions. The pamphlet provides information on common military flight corridors, low level training routes, and typical flight profiles of B-1B and C-130J aircraft. It contains contact information for various offices at Dyess AFB and advises local aviators on safety measures and techniques to avoid mid-air collisions.

Findings
- Surveyors and crop dusters are required to contact the air traffic control tower before entering Dyess AFB-controlled airspace.
- A representative from the crop dusting community voiced an issue that Dyess AFB not allowing crop dusters timely access to their controlled airspace has resulted in economic impacts to the agricultural industry in recent years.
- Some pilots do not have radios in their aircraft and use a cell phone for communication.
Figure 5.13-1

Pipelines Around Dyess AFB

Legend
- Crude Gathering
- Crude Transmission
- Gas Gathering
- Gas Transmission
- Hazardous Liquid Products (Gas)
- Highly Volatile Liquids (Propane)
- Dyess Air Force Base
- Interstate Highway
- County
- Local Road
- Railroad
- Water Body
- Stream / River
- Runway / Airfield
- Community Covered by JLUS
- Tye Extraterritorial Jurisdiction

Source: Railroad Commission of Texas 2016 (For Planning Purposes Only).
5.14 Land Use (LU)

The basis of land use planning and regulation relates to the government’s role in protecting the public’s health, safety, and welfare. Local jurisdictions’ comprehensive plans and zoning ordinances can be the most effective tools for preventing 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 adversely impact the use of another. For instance, industrial uses are often separated from residential uses to avoid impacts from noise, odors, and lighting.

Key Terms

**Accident Potential Zone I (APZ I).** APZ I is an area beginning at the end of each clear zone (see definition below) and continuing out to a length of 5,000 feet long by 3,000 feet wide. This area has a lower potential for mishaps in comparison to the clear zone and therefore has less prohibitive development restrictions recommended.

**Accident Potential Zone II (APZ II).** APZ II is an area that begins at the end of each APZ I and extends an additional 7,000 feet long by 3,000 feet wide. This APZ can also be curved as the flight patterns are a consideration in designating this APZ. Again, the potential for mishaps in this area is reduced further in comparison to the clear zone and APZ I, and with this, some additional development types are allowed.

**Clear Zone (CZ).** The CZ is the area with the highest statistical potential of an aircraft mishap. As the name implies, the DOD recommends that this area be kept clear of all development or structures. A CZ begins at the physical end of a runway and extends outward, covering an area that is 3,000 feet wide by 3,000 feet long.

**Land Use Planning.** Land use planning stems from the Supreme Court decision of *Euclid vs. Ambler* which enabled jurisdictions to regulate land use through zoning land in order to protect the public’s health, safety, and welfare. Zoning is a land use regulation tool used by local jurisdictions that generally controls use, density, intensity, building heights, and setbacks on a parcel or lot. A comprehensive plan is a land use document that broadly establish a vision, goals, policies, and implementation activities for a jurisdiction over a long range period of time, typically ten to twenty years, to promote compatible / recommended land use and guide growth and logical development.

Local jurisdictions’ comprehensive plans and zoning ordinances are the most effective tools to avoid and resolve land use compatibility issues. These tools ensure similar and compatible / recommended land uses are properly located and can co-exist while separating land uses that differ significantly in use and potential nuisance. In the State of Texas, cities such as Abilene and Tye can develop zoning ordinances and comprehensive plans, but counties such as Taylor do not have the authority to do so.

**Plat.** A plat is a document, which graphically shows the division of property, the alignment of road rights-of-way, the location of public drainage and utility easements and other important information concerning a particular parcel of land. A plat is generally prepared when a tract of land is divided into two or more tracts. The creation of these tracts often requires the dedication of roadways, drainage easements, utility easements and other land interests. A plat is a convenient method of showing these changes on a map along with its dedication language. Tracts created by a plat are easily identified in the public record and simplify land descriptions and transactions.

**Sensitive Land Uses.** In terms of compatibility assessment, sensitive land uses are uses that are susceptible to, and affected by, nuisances such as noise, dust and air pollution. Sensitive land uses typically include residential areas, hospitals, convalescent homes and facilities, schools, libraries, churches, recreational areas, and other similar land uses.

**Technical Background**

Land use planning around military installations is similar to the process for evaluating other types of land uses. For instance, local jurisdictions consider compatibility factors such as noise when locating residential developments near commercial or industrial uses. As the land between local municipalities is developed — or the land between a local municipality and the perimeter of a military installation is developed both entities are affected. New residents, tenants, or
build owners are typically not fully aware of the implications of locating in close proximity to an active military installation and / or training area.

Among the most pressing factors causing incompatibility / not recommended uses with installations containing a military airfield and weapons training are the proximate areas of encroaching development, as well as off-installation light pollution from that development which may impact the military operations. The development of land uses incompatible / not recommended with the installation’s military operations threatens that installation’s mission success and its continued existence.

**Air Installation Compatible Use Zone Study**

The primary function of the Dyess AFB Air Installation Compatible Use Zone (AICUZ) Study is to provide information on aircraft operations at Dyess AFB that cause noise and safety hazards and to promote compatible / recommended land development in areas subject to such operational noise and accident potential. The AICUZ Study provides information to assist communities in protecting the quality of life of residents and the public near the airfield and also protect the airfield from encroachment due to the development of incompatible / not recommended land uses and structures. This is done through the establishment of airfield safety zones (CZs and APZs) and noise zones. The dimensions of the CZs and APZs are based on the type of runway and the noise zones are based on a variety of factors including the type of aircraft flown at the base, how often they fly, direction of takeoffs and landings, and terrain around the airfield.

The AICUZ is not an enforceable document, but instead provides recommended land use guidelines that communities can use to guide future land use decisions. The guidelines provide information on land uses which are compatible / recommended with airfield operations while allowing maximum beneficial use of adjacent properties. The AICUZ states that the US Air Force has no desire to recommend land use regulations that render property economically useless, but it does have an obligation to residents around Dyess AFB to point out ways to protect the public investment in the base and the safety and quality of life of the public.

The AICUZ includes a table, established by Air Force Instruction 32-7063, which identifies a wide variety of land uses and whether they are compatible / recommended, conditionally compatible / recommended, or incompatible / not recommended in the various safety and noise zones. The guidelines in the AICUZ have been established through the assessment of studies prepared and sponsored by several federal agencies, including the Department of Housing and Urban Development, US Environmental Protection Agency, and US Air Force / DOD, as well as state and local agencies. While the Air Force Instruction 32-7063 includes a wide variety of common and some uncommon land uses, it does not include every possible land use type. For this reason, if these guidelines are used as a reference for assessing a proposed land use within the APZs, then the jurisdiction should use available resources and information to make an informed decision as to whether the proposed use would be compatible / recommended with the military mission, while taking into consideration existing land use, land ownership patterns, land values, previous community experience with aircraft operations, and protecting the existing character and stability of existing land uses. The Standard Land Use Coding Manual provides a much more detailed list and information on specific land uses that fall within the various land use categories.

It should be noted that Air Force Instruction 32-7063 was most recently updated in December 2015, but the AICUZ was last updated in January 2015, so it does not include all of the updates from the Air Force Instruction. Since the recommended land use table was updated, the JLUS compatibility assessment of land uses is based on the December 2015 Air Force Instruction 32-7063 table, but references to AICUZ compatibility / recommended land uses will still be used. Table 5.14-1 provides the recommended land use guidelines within the safety zones.
<table>
<thead>
<tr>
<th>SLUCM No.</th>
<th>Land Use Name</th>
<th>Clear Zone</th>
<th>APZ I</th>
<th>APZ II</th>
<th>Density</th>
</tr>
</thead>
<tbody>
<tr>
<td>10</td>
<td>Residential</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>Household units</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>11.11</td>
<td>Single units: detached</td>
<td>N</td>
<td>N</td>
<td>Y²</td>
<td>Maximum density of 2 dwelling units per acre</td>
</tr>
<tr>
<td>11.12</td>
<td>Single units: semi-detached</td>
<td>N</td>
<td>N</td>
<td>N</td>
<td></td>
</tr>
<tr>
<td>11.13</td>
<td>Single units: attached row</td>
<td>N</td>
<td>N</td>
<td>N</td>
<td></td>
</tr>
<tr>
<td>11.21</td>
<td>Two units: side-by-side</td>
<td>N</td>
<td>N</td>
<td>N</td>
<td></td>
</tr>
<tr>
<td>11.22</td>
<td>Two units: one above the other</td>
<td>N</td>
<td>N</td>
<td>N</td>
<td></td>
</tr>
<tr>
<td>11.31</td>
<td>Apartments: walk-up</td>
<td>N</td>
<td>N</td>
<td>N</td>
<td></td>
</tr>
<tr>
<td>11.32</td>
<td>Apartment: elevator</td>
<td>N</td>
<td>N</td>
<td>N</td>
<td></td>
</tr>
<tr>
<td>12</td>
<td>Group quarters</td>
<td>N</td>
<td>N</td>
<td>N</td>
<td></td>
</tr>
<tr>
<td>13</td>
<td>Residential hotels</td>
<td>N</td>
<td>N</td>
<td>N</td>
<td></td>
</tr>
<tr>
<td>14</td>
<td>Mobile home parks or courts</td>
<td>N</td>
<td>N</td>
<td>N</td>
<td></td>
</tr>
<tr>
<td>15</td>
<td>Transient lodgings</td>
<td>N</td>
<td>N</td>
<td>N</td>
<td></td>
</tr>
<tr>
<td>16</td>
<td>Other residential</td>
<td>N</td>
<td>N</td>
<td>N</td>
<td></td>
</tr>
<tr>
<td>20</td>
<td>Manufacturing¹</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>21</td>
<td>Food and kindred products; manufacturing</td>
<td></td>
<td></td>
<td></td>
<td>Maximum floor are ratio 0.56 in APZ II</td>
</tr>
<tr>
<td>22</td>
<td>Textile mill products; manufacturing</td>
<td></td>
<td></td>
<td></td>
<td>Maximum floor are ratio 0.56 in APZ II</td>
</tr>
<tr>
<td>23</td>
<td>Apparel and other finished products; products made from fabrics, leather and similar materials; manufacturing</td>
<td>N</td>
<td>N</td>
<td>N</td>
<td></td>
</tr>
<tr>
<td>24</td>
<td>Lumber and wood products (except furniture); manufacturing</td>
<td>N</td>
<td>Y</td>
<td>Y</td>
<td>Maximum floor are ratio of 0.28 in APZ I &amp; 0.56 in APZ II</td>
</tr>
<tr>
<td>25</td>
<td>Furniture and fixtures; manufacturing</td>
<td></td>
<td></td>
<td></td>
<td>Maximum floor are ratio of 0.28 in APZ I &amp; 0.56 in APZ II</td>
</tr>
<tr>
<td>26</td>
<td>Paper and allied products; manufacturing</td>
<td></td>
<td></td>
<td></td>
<td>Maximum floor are ratio of 0.28 in APZ I &amp; 0.56 in APZ II</td>
</tr>
<tr>
<td>27</td>
<td>Printing, publishing, and allied industries</td>
<td></td>
<td></td>
<td></td>
<td>Maximum floor are ratio of 0.28 in APZ I &amp; 0.56 in APZ II</td>
</tr>
<tr>
<td>28</td>
<td>Chemicals and allied products; manufacturing</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>29</td>
<td>Petroleum refining and related industries</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>30</td>
<td>Manufacturing² (continued)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>31</td>
<td>Rubber and miscellaneous plastic products; manufacturing</td>
<td>N</td>
<td>N</td>
<td>N</td>
<td></td>
</tr>
</tbody>
</table>
## Suggested Land Use Compatibility

<table>
<thead>
<tr>
<th>SLUCM No.</th>
<th>Land Use Name</th>
<th>Clear Zone</th>
<th>APZ I</th>
<th>APZ II</th>
<th>Density</th>
</tr>
</thead>
<tbody>
<tr>
<td>32</td>
<td>Stone, clay, and glass products; manufacturing</td>
<td>N</td>
<td>N</td>
<td>Y</td>
<td>Maximum floor are ratio 0.56 in APZ II</td>
</tr>
<tr>
<td>33</td>
<td>Primary metal products; manufacturing</td>
<td>N</td>
<td>N</td>
<td>Y</td>
<td>Maximum floor are ratio 0.56 in APZ II</td>
</tr>
<tr>
<td>34</td>
<td>Fabricated metal products; manufacturing</td>
<td>N</td>
<td>N</td>
<td>Y</td>
<td>Maximum floor are ratio 0.56 in APZ II</td>
</tr>
<tr>
<td>35</td>
<td>Professional, scientific, and controlling instruments; photographic and optical goods; watches and clocks</td>
<td>N</td>
<td>N</td>
<td>N</td>
<td></td>
</tr>
<tr>
<td>39</td>
<td>Miscellaneous manufacturing</td>
<td>N</td>
<td>Y</td>
<td>Y</td>
<td>Maximum floor are ratio of 0.28 in APZ I &amp; 0.56 in APZ II</td>
</tr>
<tr>
<td>40</td>
<td>Transportation, communication, and utilities</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>41</td>
<td>Railroad, rapid rail transit, and street railway transportation</td>
<td>N</td>
<td>Y⁶</td>
<td>Y</td>
<td>Maximum floor are ratio of 0.28 in APZ I &amp; 0.56 in APZ II</td>
</tr>
<tr>
<td>42</td>
<td>Motor vehicle transportation</td>
<td>N</td>
<td>Y⁶</td>
<td>Y</td>
<td>Maximum floor are ratio of 0.28 in APZ I &amp; 0.56 in APZ II</td>
</tr>
<tr>
<td>43</td>
<td>Aircraft transportation</td>
<td>N</td>
<td>Y⁶</td>
<td>Y</td>
<td>Maximum floor are ratio of 0.28 in APZ I &amp; 0.56 in APZ II</td>
</tr>
<tr>
<td>44</td>
<td>Marine craft transportation</td>
<td>N</td>
<td>Y⁶</td>
<td>Y</td>
<td>Maximum floor are ratio of 0.28 in APZ I &amp; 0.56 in APZ II</td>
</tr>
<tr>
<td>45</td>
<td>Highway and street right-of-way</td>
<td>Y⁵</td>
<td>Y⁶</td>
<td>Y</td>
<td>Maximum floor are ratio of 0.28 in APZ I &amp; 0.56 in APZ II</td>
</tr>
<tr>
<td>46</td>
<td>Automobile parking</td>
<td>N</td>
<td>Y⁶</td>
<td>Y</td>
<td>Maximum floor are ratio of 0.28 in APZ I &amp; 0.56 in APZ II</td>
</tr>
<tr>
<td>47</td>
<td>Communication</td>
<td>N</td>
<td>Y⁶</td>
<td>Y</td>
<td>Maximum floor are ratio of 0.28 in APZ I &amp; 0.56 in APZ II</td>
</tr>
<tr>
<td>48</td>
<td>Utilities⁷</td>
<td>N</td>
<td>Y⁶</td>
<td>Y⁶</td>
<td>Maximum floor are ratio of 0.28 in APZ I &amp; 0.56 in APZ II</td>
</tr>
<tr>
<td>48.5</td>
<td>Solid waste disposal (landfills, incinerators, etc.)</td>
<td>N</td>
<td>N</td>
<td>N</td>
<td></td>
</tr>
<tr>
<td>49</td>
<td>Other transportation, communication, and utilities</td>
<td>N</td>
<td>Y⁶</td>
<td>Y</td>
<td>See note 6 below</td>
</tr>
<tr>
<td>50</td>
<td>Trade</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>51</td>
<td>Wholesale trade</td>
<td>N</td>
<td>Y</td>
<td>Y</td>
<td>Maximum floor are ratio of 0.28 in APZ I &amp; 0.56 in APZ II</td>
</tr>
<tr>
<td>SLUCM No.</td>
<td>Land Use Name</td>
<td>Clear Zone</td>
<td>APZ I</td>
<td>APZ II</td>
<td>Density</td>
</tr>
<tr>
<td>-----------</td>
<td>--------------------------------------------------------------------------------</td>
<td>------------</td>
<td>-------</td>
<td>--------</td>
<td>---------------------------------------------</td>
</tr>
<tr>
<td>52</td>
<td>Retail trade – building materials, hardware and farm equipment</td>
<td>N</td>
<td>Y</td>
<td>Y</td>
<td>See note 8 below</td>
</tr>
<tr>
<td>53</td>
<td>Retail trade – including discount clubs, home improvement stores, electronics superstores, etc.</td>
<td>N</td>
<td>N</td>
<td>Y</td>
<td>Maximum floor are ratio 0.16 in APZ II</td>
</tr>
<tr>
<td>53</td>
<td>Shopping centers-Neighborhood, Community, Regional, Super-regional⁹</td>
<td>N</td>
<td>N</td>
<td>N</td>
<td></td>
</tr>
<tr>
<td>54</td>
<td>Retail trade - food</td>
<td>N</td>
<td>N</td>
<td>Y</td>
<td>Maximum floor are ratio 0.24 in APZ II</td>
</tr>
<tr>
<td>55</td>
<td>Retail trade – automotive, marine craft, aircraft, and accessories</td>
<td>N</td>
<td>Y</td>
<td>Y</td>
<td>Maximum floor are ratio 0.14 in APZ I &amp; 0.28 in APZ II</td>
</tr>
<tr>
<td>56</td>
<td>Retail trade – apparel and accessories</td>
<td>N</td>
<td>N</td>
<td>Y</td>
<td>Maximum floor are ratio 0.28 in APZ II</td>
</tr>
<tr>
<td>57</td>
<td>Retail trade – furniture, home furnishings and equipment</td>
<td>N</td>
<td>N</td>
<td>Y</td>
<td>Maximum floor are ratio 0.28 in APZ II</td>
</tr>
<tr>
<td>58</td>
<td>Retail trade – eating and drinking establishments</td>
<td>N</td>
<td>N</td>
<td>N</td>
<td></td>
</tr>
<tr>
<td>59</td>
<td>Other retail trade</td>
<td>N</td>
<td>N</td>
<td>Y</td>
<td>Maximum floor are ratio 0.16 in APZ II</td>
</tr>
<tr>
<td>60 Services¹⁰</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>61</td>
<td>Finance, insurance and real estate services</td>
<td>N</td>
<td>N</td>
<td>Y</td>
<td>Maximum floor are ratio 0.22 in APZ II</td>
</tr>
<tr>
<td>62</td>
<td>Personal services</td>
<td>N</td>
<td>N</td>
<td>Y</td>
<td>Office uses only. Maximum floor are ratio 0.22 in APZ II</td>
</tr>
<tr>
<td>62.4</td>
<td>Cemeteries</td>
<td>N</td>
<td>Y¹¹</td>
<td>Y¹¹</td>
<td></td>
</tr>
<tr>
<td>63</td>
<td>Business services (credit reporting; mail, stenographic, reproduction; advertising)</td>
<td>N</td>
<td>N</td>
<td>Y</td>
<td>Maximum floor are ratio 0.22 in APZ II</td>
</tr>
<tr>
<td>63.7</td>
<td>Warehousing and storage services¹²</td>
<td>N</td>
<td>Y</td>
<td>Y</td>
<td>Maximum floor are ratio 1.0 in APZ I; 2.0 in APZ II</td>
</tr>
<tr>
<td>64</td>
<td>Repair services</td>
<td>N</td>
<td>Y</td>
<td>Y</td>
<td>Maximum floor are ratio 0.11 in APZ I; 0.22 in APZ II</td>
</tr>
<tr>
<td>65</td>
<td>Professional services</td>
<td>N</td>
<td>N</td>
<td>Y</td>
<td>Maximum floor are ratio 0.22 in APZ II</td>
</tr>
<tr>
<td>65.1</td>
<td>Hospitals, nursing homes</td>
<td>N</td>
<td>N</td>
<td>N</td>
<td></td>
</tr>
<tr>
<td>65.1</td>
<td>Other medical facilities</td>
<td>N</td>
<td>N</td>
<td>N</td>
<td></td>
</tr>
<tr>
<td>66</td>
<td>Contract construction services</td>
<td>N</td>
<td>Y</td>
<td>Y</td>
<td>Maximum floor are ratio 0.11 in APZ I; 0.22 in APZ II</td>
</tr>
<tr>
<td>67</td>
<td>Government services</td>
<td>N</td>
<td>N</td>
<td>Y</td>
<td></td>
</tr>
<tr>
<td>SLUCM No.</td>
<td>Land Use Name</td>
<td>Clear Zone</td>
<td>APZ I</td>
<td>APZ II</td>
<td>Density</td>
</tr>
<tr>
<td>-----------</td>
<td>---------------------------------------------------</td>
<td>------------</td>
<td>-------</td>
<td>--------</td>
<td>------------------</td>
</tr>
<tr>
<td>68</td>
<td>Educational services</td>
<td>N</td>
<td>N</td>
<td>N</td>
<td>0.24 in APZ II</td>
</tr>
<tr>
<td>68.1</td>
<td>Child care services, child development centers, and nurseries</td>
<td>N</td>
<td>N</td>
<td>N</td>
<td></td>
</tr>
<tr>
<td>69</td>
<td>Miscellaneous services</td>
<td>N</td>
<td>N</td>
<td>Y</td>
<td>Maximum floor are ratio 0.22 in APZ II</td>
</tr>
<tr>
<td>69.1</td>
<td>Religious activities (including places of worship)</td>
<td>N</td>
<td>N</td>
<td>N</td>
<td></td>
</tr>
<tr>
<td>70</td>
<td>Cultural, entertainment and recreational</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>71</td>
<td>Cultural activities</td>
<td>N</td>
<td>N</td>
<td>N</td>
<td></td>
</tr>
<tr>
<td>71.2</td>
<td>Nature exhibits</td>
<td>N</td>
<td>N</td>
<td>Y&lt;sup&gt;13&lt;/sup&gt;</td>
<td>Y&lt;sup&gt;13&lt;/sup&gt;</td>
</tr>
<tr>
<td>72</td>
<td>Public Assembly</td>
<td>N</td>
<td>N</td>
<td>N</td>
<td></td>
</tr>
<tr>
<td>72.1</td>
<td>Auditoriums, concert halls</td>
<td>N</td>
<td>N</td>
<td>N</td>
<td></td>
</tr>
<tr>
<td>72.11</td>
<td>Outdoor music shells, amphitheaters</td>
<td>N</td>
<td>N</td>
<td>N</td>
<td></td>
</tr>
<tr>
<td>72.2</td>
<td>Outdoor sports arenas, spectator sports</td>
<td>N</td>
<td>N</td>
<td>N</td>
<td></td>
</tr>
<tr>
<td>73</td>
<td>Amusements – fairgrounds, miniature golf, driving ranges; amusement parks, etc.</td>
<td>N</td>
<td>N</td>
<td>N</td>
<td>Y&lt;sup&gt;20&lt;/sup&gt;</td>
</tr>
<tr>
<td>74</td>
<td>Recreational activities (including golf courses, riding stables, water recreation)</td>
<td>N</td>
<td>Y&lt;sup&gt;13&lt;/sup&gt;</td>
<td>Y&lt;sup&gt;13&lt;/sup&gt;</td>
<td>Maximum floor are ratio 0.11 in APZ I; 0.22 in APZ II</td>
</tr>
<tr>
<td>75</td>
<td>Resorts and group camps</td>
<td>N</td>
<td>N</td>
<td>N</td>
<td></td>
</tr>
<tr>
<td>76</td>
<td>Parks</td>
<td>N</td>
<td>N</td>
<td>Y&lt;sup&gt;13&lt;/sup&gt;</td>
<td>Y&lt;sup&gt;13&lt;/sup&gt;</td>
</tr>
<tr>
<td>79</td>
<td>Other cultural, entertainment and recreation</td>
<td>N</td>
<td>Y&lt;sup&gt;11&lt;/sup&gt;</td>
<td>Y&lt;sup&gt;11&lt;/sup&gt;</td>
<td>Maximum floor are ratio 0.11 in APZ I; 0.22 in APZ II</td>
</tr>
<tr>
<td>80</td>
<td>Resource production and extraction</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>81</td>
<td>Agriculture (except livestock)</td>
<td>Y&lt;sup&gt;4&lt;/sup&gt;</td>
<td>Y&lt;sup&gt;14&lt;/sup&gt;</td>
<td>Y&lt;sup&gt;14&lt;/sup&gt;</td>
<td></td>
</tr>
<tr>
<td>81.5-81.7</td>
<td>Agriculture-Livestock farming, including grazing and feedlots</td>
<td>N</td>
<td>Y&lt;sup&gt;14&lt;/sup&gt;</td>
<td>Y&lt;sup&gt;14&lt;/sup&gt;</td>
<td></td>
</tr>
<tr>
<td>82</td>
<td>Agriculture related activities</td>
<td>N</td>
<td>Y&lt;sup&gt;15&lt;/sup&gt;</td>
<td>Y&lt;sup&gt;15&lt;/sup&gt;</td>
<td>Maximum floor are ratio 0.28 in APZ I; 0.56 in APZ II; no activity which produces smoke, glare, or involves explosives</td>
</tr>
<tr>
<td>83</td>
<td>Forestry activities&lt;sup&gt;16&lt;/sup&gt;</td>
<td>N</td>
<td>Y</td>
<td>Y</td>
<td>Maximum floor are ratio 0.28 in APZ I; 0.56 in APZ II; no activity which produces smoke, glare, or involves explosives</td>
</tr>
<tr>
<td>SLUCM No.</td>
<td>Land Use Name</td>
<td>Clear Zone</td>
<td>APZ I</td>
<td>APZ II</td>
<td>Density</td>
</tr>
<tr>
<td>----------</td>
<td>--------------------------------------------</td>
<td>------------</td>
<td>-------</td>
<td>--------</td>
<td>---------</td>
</tr>
<tr>
<td>84</td>
<td>Fishing activities¹⁷</td>
<td>N¹⁷</td>
<td>Y</td>
<td>Y</td>
<td>Maximum floor are ratio 0.28 in APZ I; 0.56 in APZ II; no activity which produces smoke, glare, or involves explosives</td>
</tr>
<tr>
<td>85</td>
<td>Mining activities¹⁸</td>
<td>N</td>
<td>Y¹⁸</td>
<td>Y¹⁸</td>
<td>Maximum floor are ratio 0.28 in APZ I; 0.56 in APZ II; no activity which produces smoke, glare, or involves explosives</td>
</tr>
<tr>
<td>89</td>
<td>Other resource production or extraction</td>
<td>N</td>
<td>Y</td>
<td>Y</td>
<td>Maximum floor are ratio 0.28 in APZ I; 0.56 in APZ II; no activity which produces smoke, glare, or involves explosives</td>
</tr>
</tbody>
</table>

| 90       | Other                                      |            |       |        |         |

| 91       | Undeveloped land                           | Y          | Y     | Y      |         |
| 93       | Water areas¹⁹                              | N¹⁹        | N¹⁹   | N¹⁹    |         |


**Key to Table:**

**Notes:**
1. A “Yes” (Y) or a “No” (N) designation for compatible land use is to be used only for general comparison. Within each uses exist where further evaluation may be needed in each category as to whether it is clearly compatible, normally compatible, or not compatible due to the variation of the densities of people and structures. In order to assist air installations and local governments, general suggestions as to FARs are provided as a guide to density in some categories. In general, land use restrictions that limit occupants, including employees, of commercial, service, or industrial buildings or structures to 25 an acre in APZ I and 50 an acre in APZ II are considered to be low density. Outside events should normally be limited to assemblies of not more than 25 people an acre in APZ I and 50 people an acre in APZ II. Recommended FARs are calculated using standard parking generation rates for various land uses, vehicle occupancy rates, and desired density in APZ I and II. For APZ I, the formula is floor area ratio = 25 people an acre / (Average Vehicle Occupancy x Average Parking Rate x (43560/1000)). The formula for APZ II is floor area ratio = 50/ (Average Vehicle Occupancy x Average Parking Rate x (43560/1000)).
2. The suggested maximum density for detached single-family housing is two dwelling units per acre. In a planned unit development (PUD) of single-family detached units, where clustered housing development results in large open areas, this density could possibly be increased slightly provided the amount of surface area covered by structures does not exceed 20 percent of the PUD total area. PUD encourages clustered development that leaves large open areas.
3. Other factors to be considered: labor intensity, structural coverage, explosive characteristics, air pollution, electronic interference with aircraft, height of structures, and potential glare to pilots.
4. No structures (except airfield lighting and navigational aids necessary for the safe operation of the airfield when there are no other siting options), buildings, or above-ground utility and communications lines should normally be located in Clear Zone areas on or off the air installation. The Clear Zone is subject to the most severe restrictions.
5. Roads within the graded portion of the Clear Zone are prohibited. All roads within the Clear Zone are discouraged, but if required, they should not be wider than two lanes and the rights-of-way should be fenced (frangible) and not include sidewalks or bicycle trails. Nothing associated with these roads should violate obstacle clearance criteria.
6. No above ground passenger terminals and no above ground power transmission or distribution lines. Prohibited power lines include high-voltage transmission lines and distribution lines that provide power to cities, towns, or regional power for unincorporated areas.

7. Development of renewable energy resources, including solar and geothermal facilities and wind turbines, may impact military operations through hazards to flight or electromagnetic interference. Each new development should be analyzed for compatibility issues on a case-by-case basis that considers both the proposal and potentially affected mission.

8. Within SLUCM Code 52, maximum FARs for lumberyards (SLUCM Code 521) are 0.20 in APZ-I and 0.40 in APZ-11; the maximum FARs for hardware, paint, and farm equipment stores, (SLUCM Code 525), are 0.12 in APZ I and 0.24 in APZ II.

9. A shopping center is an integrated group of commercial establishments that is planned, developed, owned, or managed as a unit. Shopping center types include strip, neighborhood, community, regional, and super-regional facilities anchored by small businesses, a supermarket or drug store, discount retailer, department store, or several department stores, respectively.

10. Ancillary uses such as meeting places, auditoriums, etc. are not recommended.

11. No chapels or houses of worship are allowed within APZ I or APZ II.

12. Big box home improvement stores are not included as part of this category.

13. Facilities must be low intensity, and provide no playgrounds, etc. Facilities such as club houses, meeting places, auditoriums, large classes, etc., are not recommended.

14. Activities that attract concentrations of birds creating a hazard to aircraft operations should be excluded.

15. Factors to be considered: labor intensity, structural coverage, explosive characteristics, and air pollution.

16. Lumber and timber products removed due to establishment, expansion, or maintenance of Clear Zone lands owned in fee will be disposed of in accordance with applicable DOD guidance.

17. Controlled hunting and fishing may be permitted for the purpose of wildlife management.

18. Surface mining operations that could create retention ponds that may attract waterfowl and present bird/wildlife aircraft strike hazards (BASH), or operations that produce dust or light emissions that could affect pilot vision are not compatible.

19. Naturally occurring water features (e.g., rivers, lakes, streams, wetlands) are pre-existing, nonconforming land uses. Naturally occurring water features that attract waterfowl present a potential BASH. Actions to expand naturally occurring water features or construction of new water features should not be encouraged. If construction of new features is necessary for storm water retention, such features should be designed so that they do not attract waterfowl.

20. Amusement centers, family entertainment centers or amusement parks designed or operated at a scale that could attract or result in concentrations of people, including employees and visitors, greater than 50 people per acre at any given time are incompatible in APZ II.
During the JLUS process, members of the JLUS Technical Advisory Committee and Policy Committee representing property owners from the View / Caps Community publicly stated and documented that they do not agree with many of the recommendations within the AICUZ and that they do not want or believe that land use regulations are needed to address land uses within all of the AICUZ areas. The property owners accepted the establishment of zoning regulations within the APZs, but would be apprehensive of any revisions to the existing regulations and would be involved in any changes in the future. The View / Caps representatives have voiced many concerns over the years about the City of Abilene’s interpretation and use of the AICUZ as a guidance document instead of a document that provides recommendations. As stated previously, the AICUZ does not include a compatibility assessment of every single type of land use to identify whether it would be incompatible / not recommended or compatible / recommended within the various Dyess AFB airfield safety zones. View / Caps representatives have concerns that the City of Abilene will determine that any land use not specifically identified in the AICUZ will be determined incompatible / not recommended within the safety zones and the owner / developer will have difficulty getting the use approved, if they can at all, because the City will deny the application. This was the case in recent years when an ambulance service operator was looking to purchase a building, which was within the safety zones, to relocate its operations to. The City denied the initial application, as “ambulance service” is not identified in the AICUZ, so the City determined it to be incompatible / not recommended. The ambulance service operator had to go through a lengthy process to get final approval to relocate into the existing structure.

Specific uses should not be automatically determined as incompatible / not recommended just because they are not included in the AICUZ. In the event that a proposed land use is not in the AICUZ, the SLUCM could be consulted as a starting point to assist in the process of reviewing the proposed land use. The SLUCM and AICUZ should not be used to make the ultimate decision on land uses within the Dyess AFB accident potential zones.

**Compatibility Assessment**

The Dyess AFB AICUZ includes an assessment of land uses within the airfield safety zones. The existing land uses that were illustrated in the AICUZ were derived from 2013 data provided by Taylor County, 2004 data from the City of Tye, and 2001 National Land Use Cover Dataset for areas of Taylor County where no land use data existed in the Taylor County or City of Tye data. For the land use assessment in the AICUZ, all lands were categorized into one of the following six generalized categories:

- **Residential**: All types of residential activity, such as single- and multi-family residences and mobile homes, at a density greater than one dwelling unit per acre.
- **Commercial**: Offices, retail, restaurants, businesses, and other types of commercial activity.
- **Industrial**: Areas and the facilities they contain that are owned or used for manufacturing, warehousing, and other similar uses.
- **Public / Quasi-Public**: Publicly owned lands or lands to which the public has access, such as public buildings or institutional facilities.
- **Recreational**: Land areas designated for recreational activity, including local parks; wilderness areas and reservations; conservation...
Compatibility Assessment

areas; and areas designated for trails, hikes, camping, and other similar uses.

- **Open Space / Low-Density:** Undeveloped land areas, forested land, agricultural land, grazing areas, water or wetland areas, and areas with residential activity at densities less than or equal to one dwelling per acre.

The City of Tye is a small incorporated community that borders Dyess AFB to the north. Tye covers approximately 3,070 acres of land, about 77 percent of which is open space / low-density use. Tye is primarily a residential community, with some commercial and industrial development along Interstate 20 and Scott Street. The mix of residential in Tye is roughly 39 percent single-family houses and 61 percent mobile homes. The majority of the development in Tye exists either along Interstate 20 or in the center of the city, east of Scott Street, between Interstate 20 and Air Base Road. The land in the center is generally laid out in a grid pattern and is composed of residential, recreational, and public / quasi-public use. Roughly one-third of the development in the center of the city falls within APZ I.

**Existing Land Use**

There are several existing land uses in the City of Tye within the APZs that are incompatible / not recommended with Air Force Instruction 32-7063. Within APZ I there are several residential land uses. It is recommended that residential uses not occur in APZ I due to the concentration of people and safety concerns in the event of an aircraft mishap. The majority of this residential use is in the center of the city, but there is one house located just north of the border of the CZ. There are also a few residential units on the north side of North Street. Tye Baptist Church is in APZ I and is incompatible / not recommended because it encourages the congregating of people. There are some commercial, industrial, and public uses in APZ I that are generally compatible / recommended at their current level of development. Growth or expansion of these uses in the future should be monitored to ensure a compatible / recommended level of intensity is maintained. All of the open space and agricultural land is compatible / recommended as well.

Within APZ II, the Tye RV Park on the north side of Interstate 20 is an incompatible / not recommended use since it exceeds the recommended maximum residential density of two dwelling units per acre within APZ II. The existing commercial and industrial uses in APZ II are compatible / recommended, as is the open space and agricultural use.

Figure 5.14-1A illustrates the existing generalized land use categories in Tye and the compatibility of each type of land use within the airfield safety zones, and Figure 5.14-1B provides an aerial image of the existing land uses.

**Zoning**

Tye’s zoning ordinance separates the land in the city into eight zoning districts. Within APZ I, all land zoned as Single-Family Residential is incompatible / not recommended. This land is near the center of the city and is already established with residential uses, so it is unlikely to change from residential in the future. There are a few parcels of land, including Tye Baptist Church and some vacant land, that are zoned residential as well. Future development of residential on these lands would be incompatible / not recommended. There is a small amount of land within the Local Business District on the west side of APZ I. This district is conditionally compatible / recommended in APZ I. It allows some incompatible / not recommended uses such as residential, educational facilities, health care facilities, grocery stores, theaters, and playgrounds, but many of the small-scale commercial activities that are likely to occur in this zone are generally compatible / recommended. The Agricultural Open Space District, also in APZ I, is generally compatible / recommended as long as residential units (an allowable use) are not developed. There are also several uses, such as schools and a nursing / retirement home that are allowed through special permit, which are incompatible / not recommended.
Figure 5.14-1A
Existing Land Use Compatibility in Dyess AFB Northern Safety Zones
Existing Land Use Compatibility in Dyess AFB Northern Safety Zones (Aerial)

Figure 5.14-1B

Legend
- Clear Zone
- Dyess Air Force Base
- Interstate
- City of Tye
- Highway
- Tye Extraterritorial Jurisdiction (ETJ)
- Local Road
- Railroad
- Runway / Airfield
- Stream / River

In APZ II, there is a very small amount of land within the Local Business District and General Business District, all of which is compatible / recommended at the current level of development. The land is located along Interstate 20, so any future development in the area would likely be similar to the existing development and be compatible / recommended with APZ II. There is some land in the Light Industrial District in APZ II that allows some uses that are incompatible / not recommended such as educational facilities and nursing homes. However, given the current development and character of the area, it is likely that any future development in this zone would be compatible / recommended. Nonetheless, it should be monitored. The remaining Agricultural Open Space District in APZ II is generally compatible / recommended, but allows some incompatible / not recommended uses such as residential at a density greater than two dwelling units per acre and educational facilities.

Figure 5.14-2 illustrates the zoning categories in Tye and the compatibility of each district within the airfield safety zones.

**Future Land Use**

For the most part, future development in Tye is not anticipated to occur within the APZs. The exception to this is land along Interstate 20. This area has experienced relatively steady growth in recent years (given Tye’s rural nature), mostly in the forms of light commercial, industrial, and automotive-related industry. Interstate 20 is a well-used truck route through the region, so a lot of the recent development has been geared towards truck drivers, such as service shops, as well as automotive sales. While not all of this growth has occurred in the APZs, it will be important to monitor land in the APZs in the future to assess compatibility.

Tye’s future land use map identifies residential land in APZ I, but this is to reflect that existing residential use will stay the same in the future. Therefore, while it is incompatible / not recommended, it is categorizing the existing use and not accounting for new residential development in the future. Land identified as Public / Semi-Public in APZ I reflect existing land uses and are not likely to change, especially the cemetery. Land in APZ II identified for future commercial and industrial also reflect a degree of the existing use, and future use of these areas will likely remain similar and be compatible / recommended. The remaining land in APZ I and II is identified as agricultural or vacant, which is compatible / recommended.

Figure 5.14-3 illustrates the future land use designations in Tye and the compatibility of each within the airfield safety zones.

**Findings**

- Tye has existing incompatible / not recommended development in the APZs, but future development in these areas is anticipated to be compatible / recommended.
- Tye does not have a zoning overlay to address land in the APZs.
Zoning Compatibility in Dyess AFB Northern Safety Zones

Legend
- **Clear Zone**
- **APZ I**
- **APZ II**
- **Dyess Air Force Base**
- **City of Tye**
- **Tye Extraterritorial Jurisdiction (ETJ)**
- **Interstate**
- **Highway**
- **Local Road**
- **Railroad**
- **Runway / Airfield**
- **Stream / River**

Source: City of Tye, 2004; Dyess AFB, 2015; Matrix Design Group, 2016
Future Land Use Compatibility Legend

- Single Family Residential
- Commercial
- Industrial
- Public, Semi-Public
- Vacant/Agricultural

Legend

- Clear Zone
- Dyess Air Force Base
- City of Tye
-dx
- City of Tye Extraterritorial Jurisdiction (ETJ)
- Interstate
- Highway
- Local Road
- Railroad
- Runway / Airfield
- Stream / River

Source: City of Tye, 2004; Dyess AFB, 2015; Matrix Design Group, 2016
ISSUE LU-2  Incompatible / not recommended land uses in Abilene’s extraterritorial jurisdiction
There are existing incompatible / not recommended land uses within Abilene’s extraterritorial jurisdiction (ETJ) based on the Dyess AFB AICUZ.

Compatibility Assessment

The CZ and APZs for the southern end of Dyess AFB’s main runway go over unincorporated land that is within the City of Abilene’s ETJ. About half of the land within the CZ is contained within the boundaries of Dyess AFB. The remaining land is held under restrictive easements to prevent development from occurring on the land, to maintain compatibility into the future.

The existing land in APZ I is primarily agricultural or vacant, which is compatible / recommended. Petrosmith operates an industrial and manufacturing site that is partially located in APZ I. This developed portions of the site are currently compatible / recommended with APZ I, but any future growth or expanded operations on the undeveloped portions should be monitored to maintain compatibility.

Part of the Petrosmith site is also located in APZ II and is compatible / recommended. According to the AICUZ, the current residential development in APZ II is conditionally compatible / recommended at the current density. As long as future residential development is at a maximum of two dwelling units per acre, then it will be compatible / recommended.

Figure 5.14-4A illustrates the existing generalized land use categories and their compatibility within Dyess AFB’s southern airfield safety zones, and Figure 5.14-4B provides an aerial image of the existing land uses.

The City of Abilene has experienced some growth in recent years, although only about half the rate of the State of Texas as a whole. From 2010 to 2050, Abilene is projected to grow by almost 22,600 people, accounting for a 19.3 percent increase in population (see Chapter 2 of the JLUS Background Report for more information on population and projections). Much of the city’s population growth from 2000 to 2010 occurred in the southwestern portion of the city (see Figures 2-1 and 2-2 in Chapter 2 of the JLUS Background Report). It is anticipated that much of the city’s future growth will occur in the southwest portion of the city, as there is available undeveloped land. Several recent residential subdivisions, accounting for hundreds of new residential units, have been approved, or are planned for this area. Some of this development has been spurred by the construction of, and proximity to, Wylie High School.

Within the southwest portion of Abilene, the current western city limit follows Elm Creek. The new major growth that is occurring is within the city limits, and for the time being, it is unlikely that the city will expand water and sewer services west of Elm Creek due to the costs of doing so. The creek serves as a natural detriment to major growth for now, but if growth pressures are strong enough in the future, the City may choose to extend services, which would allow for additional growth in the direction of Dyess AFB.

There is unlikely to be any substantial growth or development on the land south of Dyess AFB within the View / Caps Community or within the APZs. The City of Abilene has enacted its Airport Zoning Ordinance, which limits development within the APZ I and II on the south end of the Dyess AFB runway. Existing water and septic regulations are in place that also help control and limit future growth.

Findings

- Much of the recent growth, and projected future growth, in Abilene has occurred in the southwest corner of the city.
- The cost of extending city services west of Elm Creek will limit future growth outside the city limits.
- Land within the Dyess AFB APZs is regulated through the City of Abilene’s Airport Zoning Ordinance, which will limit future development in that area.
- Water and septic regulations in and around the View / Caps Community will also control future growth, as the extension and supply of water to undeveloped land in that area is costly and prohibitive to growth.
Existing Land Use Compatibility in Dyess AFB Southern Safety Zones

Figure 5.14-4A

Existing Land Use Legend

- Conditionally Compatible / Recommended
- Incompatible / Not Recommended

- Commercial
- Industrial
- Open/Low-Density

Legend
- Clear Zone
- Dyess Air Force Base
- APZ I
- APZ II
- City of Abilene
- Local Road
- Runway / Airfield
- Water Body
- Stream / River

Source: Dyess AFB AICUZ Study, 2015
Existing Land Use Compatibility in Dyess AFB Southern Safety Zones (Aerial)
Compatibility Assessment

Counties in Texas do not have the authority to adopt traditional land use regulations and policy such as those found in zoning ordinances and comprehensive plans. The City of Abilene is able to oversee some forms of land development within its ETJ through platting and subdivision regulation. Counties are allowed to establish subdivision regulations, which Taylor County has done. Taylor County’s subdivision regulations were created to establish development standards to ensure efficient and proper roadway, drainage, and utility systems (including water and wastewater) for current and future residents in the county as new land is developed. The subdivision regulations require that a plat be made and recorded when a property owner of any tract of land situated outside the corporate limits of a municipality in Taylor County divide the same into two or more parcels to lay out: a subdivision of the tract, including an addition; lots; or streets, alleys, squares, parks or other parts of the tract intended to be dedicated to public use or for the use of purchasers or owners of lots fronting on or adjacent to the streets, alleys, squares, parks, or other parts. There are some exemptions the County may allow to this requirement, where the property owner may not need to record a plat, such as if the land is to be used primarily for agricultural use, farming, ranch wildlife management or timber production, or all of the lots of the subdivision are more than 10 acres in area. The full list of exemptions is included in Article II, Section 2.04 of Taylor County’s Order Establishing Regulations for Subdivision Plats, Street Construction and Drainage.

Plats for land within Abilene’s ETJ shall not be filed with the County Clerk unless authorized by the City of Abilene because the City has exclusive authority to regulate subdivision development. Plats shall not be filed with the County Clerk for land within a municipality other than Abilene’s ETJ without authorization of Taylor County.

In the areas outside of the ETJ, property owners may not be aware that they are required to file a plat since counties in Texas generally have limited land use authority. The County expressed that new subdivisions have been developed without the County’s knowledge or approval of a plat. Depending on where this occurs relative to Dyess AFB and operational areas such as under flight patterns, governing entities and citizens should continue their efforts to ensure new development plans considers the suggested recommendation outlined in the latest Dyess AFB AICUZ.

Findings

- Taylor County’s subdivision ordinance requires property owners who subdivide their land to file a plat for review and approval.
- Within Abilene’s ETJ, plats may be filed with the City.
- Property owners outside the ETJ may not know they have to record a plat, and some development has occurred without the County’s knowledge.
Compatibility Assessment

ISSUE LU-4

Misunderstanding of the City of Abilene’s extraterritorial jurisdiction

A city’s ETJ allows the city to extend its regulatory influence outside of the city limits into a designated portion of unincorporated county land. Some property owners or residents living in Abilene’s ETJ may not be aware that they are in an area where land use can be regulated by the City.

Compatibility Assessment

Chapter 42 of the Texas State Local Government Code: Extraterritorial Jurisdiction of Municipalities designates the area beyond a municipality’s boundaries for future growth. The municipality does not have general zoning authority in this area (with the exception of airport zoning), since the designated area is not incorporated into the municipality, but the ETJ does give a municipality the right to annex land and regulate platting and subdivision development. Chapter 241 of the Texas State Local Government Code allows cities with a population of greater than 45,000 to adopt airport zoning regulations outside of the city limits, within the ETJ. The City of Abilene has established Airport Zoning regulations (Chapter 2, Division 5, Section 2.3.5.1) as part of its Land Development Code. The Airport Zoning regulations establish height limits associated with Dyess AFB’s imaginary surfaces (see Chapter 3 Dyess AFB Overview for more information on imaginary surfaces) and control land uses within the Dyess AFB CZs and APZs (see Chapter 3 Dyess AFB Overview for more information on airfield safety zones). An Airport Zone Development Permit is required for “any development, construction, modification, repair, remodeling, or change in use within an area regulated...” by Abilene’s Airport Zoning. The ordinance allows exemptions from obtaining an Airport Zone Development Permit for “any allowable home or other primary structure, addition to an existing home or other primary structure, allowable accessory structure, Natural Growth, or other obstruction less than 50 feet in height in the APZ I and less than 150 feet in height in the APZ II and beyond”.

Abilene established an ETJ in 1988. The size of the city’s population allows its ETJ to extend a distance of five miles outside of the city limits within unincorporated county lands. Incorporated communities, such as Tye, and their associated ETJs are not affected by Abilene’s ETJ. People looking to purchase land outside of the city limits of Abilene may not be aware that the land is within the ETJ and thus could be subject to a degree of regulatory authority from the city, particularly land within the Airport Zoning area. They may not be aware of height and land use restrictions on the land, which could impact their long-term land plans if the purchase is completed. Additionally, some current landowners within the ETJ may not be fully aware of the implications of being within the ETJ should they desire to develop their land in the future. Abilene’s current ETJ boundaries are shown on Figure 5.14-5.

The City of Tye also has an ETJ that encompasses land within half a mile around a portion of the city limits. Tye’s ETJ does not extend into the City of Abilene, Dyess AFB, or a small portion of land west of Tye that is within Abilene’s ETJ. The land within Tye’s ETJ is not influenced by the City of Abilene or its ETJ. There has not been much interest in development in Tye’s ETJ, and it is not anticipated to occur in the near future due to more desirable land closer to Abilene.

Findings

- Abilene’s ETJ extends out five miles past its city limits and the city has limited authority to regulate development in this area.

- Potential buyers who are unfamiliar with how extraterritorial jurisdictions work in Texas may not be aware that Abilene has some land use regulatory authority within its ETJ in Taylor County.
Legend

- Abilene Extraterritorial Jurisdiction
- Dyess Air Force Base
- County
- Community Covered by JLUS
- Other Community
- Interstate
- Highway
- Local Road
- Railroad
- Water Body
- Stream / River
- Runway / Airfield

Source: Dyess AFB 2013 AICUZ.

Figure 5.14-5

City of Abilene Extraterritorial Jurisdiction
Compatibility Assessment

 ISSUE
LU-5

No Tye building inspector
The City of Tye does not have financial resources to employ a full-time building inspector. This can result in potential incompatible / not recommended land use development if buildings are not properly inspected and approved.

Compatibility Assessment
A building inspector is necessary for a city to ensure that new development plans and construction meets the requirements of the city’s building code, zoning ordinance, and other regulations. This is an important function to protect the safety of inhabitants and users of the building, and also to maintain the community’s quality of life and make sure the building is compatible / recommended with adjacent uses. There are many aspects of buildings that must be inspected throughout the planning and construction process, but for the purposes of the JLUS, the concern for not having a building inspector relates to noise and safety. Much of the City of Tye is located within the 65 decibel or greater noise zones (see section 5.18 for more information), which the AICUZ recommends varying amounts of sound attenuation measures for any residential built within them. In terms of safety, within APZ I and APZ II, the AICUZ provides recommended limits for residential density. Although Tye’s zoning ordnance and building codes do not currently incorporate AICUZ recommendations into them, if they do in the future, a building inspector may be needed to ensure compliance.

Findings
- The majority of this residential use is in the center of the city, but there is one house located just north of the border of the CZ.
5.15 Legislative Initiatives (LEG)
Legislative initiatives are proposed changes in relevant policies, laws, regulations or programs which could potentially have a significant impact on one or more substantive areas of concern to both the facility and to the stakeholder communities. The focus of this compatibility issue is on initiatives with general and broad implications.

Findings
There were no issues identified for Legislative Initiatives for the Dyess AFB JLUS; however, the JLUS stakeholders should work with local, state and federal representatives and policy makers to monitor legislation that may impact Dyess AFB.
5.16 Light and Glare (LG)
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 aircraft operations. Conversely, high intensity light sources generated from a military area (such as ramp lighting) may have a negative impact on the adjacent community.

Key Terms
Glare. The presence of excessively bright light, such as direct or reflected sunlight, or artificial light, such as sport field and stadium lights at night. Glare reduces visibility and can completely impair vision when very intense.

Light Pollution. This type of pollution is created by the artificial brightening of sky caused by development, including street lights and other man-made sources.

<table>
<thead>
<tr>
<th>ISSUE</th>
<th>Red LED lighting on towers</th>
</tr>
</thead>
<tbody>
<tr>
<td>LG-1</td>
<td>Some commercial wind farms have started to use red LED lights for nighttime identification of their locations. Red LED lights cannot always be seen by night vision goggles, causing safety concerns when pilots are flying using such devices.</td>
</tr>
</tbody>
</table>

Compatibility Assessment
Night vision goggles are used by pilots at Dyess AFB to train for real-world scenarios. Night operations are a common occurrence when deployed and it is necessary for pilots to have proper experience using night vision goggles to reduce errors during air operations. In order to become proficient in the usage of night vision goggles, pilots need safe areas to operate that are free of obstructions and have minimal ambient light.

Obstruction lights are required by the FAA to illuminate towers and other structures (e.g., wind turbines) that may posed vertical obstructions to aircraft. In the past, Halogen bulbs were predominantly used to illuminate structures, but as technology has advanced, LED bulbs have become more widely used. Advantages of LED bulbs are reduced energy consumption, reduced maintenance cost, greater durability, and longer lifetime.

In 2007 the Energy Independence and Security Act mandated that incandescent lights of wattages between 40 to 100 no longer be produced. This resulted in manufacturers shifting production primarily to LEDs to comply with the Act. Night vision goggle technology used by Air Force pilots has difficulty processing certain wavelengths of light. The wavelengths produced by red LED bulbs are below the night vision goggle sensitivity spectrum. In 2008 the FAA published a safety alert for operations about LEDs and night vision goggles. The red LED bulbs that are now commonly used for obstruction lighting range from 610 to 700 nanometers. The night vision goggles are sensitive from 665 to 930 nanometers, which is their range of visibility in the spectrum. Since the sensitivity spectrum does not align between the obstruction lights and the night vision goggles, the lights will not be filtered through the night vision goggles, and thus may not be seen by pilots or other personnel using night vision goggles. This may lead to pilots not seeing a tower or wind turbine, which would be a safety hazard.

The usage of LED lighting is expected to become even more prevalent in the future with improved technologies and installation of new lighting fixtures on new development or upgrades to older structures. As a result, red LED lighting for vertical obstruction identification is likely to become more prominent as well. The ability to process red LED lighting with night vision goggles may require improvements or adjustments to night vision goggle technologies.

Findings
- Night vision goggles cannot process certain wavelengths of light that are below their sensitivity spectrum. Night vision goggles are sensitive from wavelengths of 665 to 930 nanometers, but red LED bulbs typically range from 610 to 700 nanometers and are not picked up by night vision goggles.
- Red LED lighting used to identify vertical obstructions might not be seen by pilots using night vision goggles.

- It is likely that red LED lighting to identify vertical obstructions will become more prevalent in the future, which may require changes to night vision goggle technologies for pilots to be able to see the lights.
5.17 Marine Environments (MAR)
Regulatory or permit requirements protecting marine and ocean resources can cumulatively affect the military’s ability to conduct operations, training exercises, or testing in a water-based environment.

Findings
There were no issues identified for Marine Environments for the Dyess AFB JLUS.
5.18 Noise (NOI)

Sound that reaches unwanted levels is referred to as noise. The central issue with 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. The decibel (dB) scale is used to quantify sound intensity. To understand the relevance of decibels, a normal conversation often occurs at 60 dB, while an ambulance siren from 100 feet away is about 100 dB. Noise associated with military operations (arrival / departure of military aircraft, firing of weapons, etc.) may create noises in higher dB ranges.

Many property owners / residents around Dyess AFB stated continuously throughout the JLUS process that noise is not a public health, safety, and welfare concern for them.

Key Terms

**Aircraft Operation.** An aircraft operation is defined as one takeoff/departure, one approach/landing, or half of a closed pattern. A closed pattern consists of two portions, a takeoff/departure and an approach/landing, i.e., two operations. A sortie is a single military aircraft flight from the initial takeoff through the termination landing. The minimum number of aircraft operations for one sortie is two operations: one takeoff (departure) and one landing (approach).

**Ambient Noise.** The total noise associated with an existing environment (built or natural) and usually comprising sounds from many sources, both near and far, is referred to as ambient noise.

**Day-Night Average Sound Level (DNL).** DNL represents an average sound exposure over a 24-hour period. During the nighttime period (10:00 p.m. to 7:00 a.m.), averages are artificially increased by 10 dB. This weighting reflects the added intrusiveness and the greater disturbance potential of nighttime noise events attributable to the fact that community background noise typically decreases by 10 dB at night.

**Decibel (dB).** A decibel is the physical unit commonly used to describe noise levels. It is a unit for describing the amplitude of sound, as heard by the human ear.

**Noise.** Defining noise from a technical perspective, sound is 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. Noise nuisance is dependent upon personal sensitivities and each person experiences noise differently. Sound that may cause unwanted noise to one person may not cause annoyance by another person.

**Noise Attenuation.** Noise attenuation is a reduction in the level of sound resulting from an object’s distance from the noise source or absorption by the surrounding topography, the atmosphere, barriers, construction techniques and materials, and other factors. Noise attenuation in buildings can be achieved through the use of special construction practices that reduce the amount of sound that penetrates the windows, doors, and walls of a building. Noise attenuation measures may be incorporated during initial construction for new buildings or as additional construction for existing buildings.

**Noise Contour.** Noise contours consist of noise impact lines constructed by connecting points of equal noise level measured in dB and identify areas on a map that fall within that particular dB noise contour. Noise contours are developed in increments of five dB from the airfield, ranging from a DNL of 65 dB DNL to 80+ dB DNL.

**Noise Sensitive Receptors/Sensitive Land Uses.** Sensitive receptors are locations and uses typically more sensitive to noise, including residential areas, hospitals, convalescent homes and facilities, schools, libraries, churches, recreational areas, and other similar land uses.

**Noise Zone.** A noise zone is the area between two noise contours.

**NOISEMAP Program.** The Department of Defense noise models are based on NOISEMAP technology, using linear acoustics and an integrated formulation to determine the impact of noise.
Technical Background
Due to the technical nature of this resource topic and its importance to the JLUS process, this section provides a discussion of the characteristics of sound and the modeling process used to evaluate noise impacts.

Characteristics of Sound
It is important to understand that there is no single perfect way of measuring sound, due to variations used by different entities when conducting sound studies or sound modeling. Sound is characterized by various parameters that include the oscillation rate of sound waves (frequency), the speed of propagation, and the pressure level or energy content (amplitude). The sound pressure level has become the most common descriptor used to characterize the loudness of an ambient sound level. The decibel (dB) scale is used to quantify sound intensity. Because sound pressure can vary by over one trillion times within the range of human hearing, a logarithmic loudness scale, i.e., the dBA scale, is used to present sound intensity levels in a convenient format.

The human ear is not equally sensitive to all frequencies within the entire spectrum, so noise measurements are weighted more heavily within those frequencies of maximum human sensitivity in a process called “A-weighting” written as dBA. The human ear can detect changes in sound levels of approximately 3-dBA under normal conditions. Changes of 1 to 3-dBA are typically noticeable under controlled conditions, while changes of less than 1dBA are only discernible under controlled, extremely quiet conditions.

A change of 5-dBA is generally noticeable to the average person in an outdoor environment. Figure 5.18-1 summarizes typical A-weighted sound levels for a range of indoor and outdoor activities.

Environmental noise fluctuates over time. While some noise fluctuations are minor, others can be substantial. These fluctuations include regular and random patterns, how fast the noise fluctuates, and the amount of variation. Weather patterns can have a strong effect on how far sound travels and how loud it is. Certain weather events can change the consistency of the air and either cause sound to travel further and be louder or reduce the distance traveled and the level at which the sound can be heard. Temperature and wind velocity are prime examples of factors that can affect sound travel. Sound tends to travel further in cold temperatures. Specific combinations of temperature and wind direction can create atmospheric refraction. Atmospheric refraction occurs when atmospheric conditions bend and/or focus sound waves towards some areas and away from others. When describing noise impacts, it is common to look at the average noise levels over an entire average day.

Dyess AFB Noise Zone Development
The current noise contours and noise zones for Dyess AFB were developed in 2013 during the update of the AICUZ Study, which was completed in 2015. The 2015 AICUZ Study was an update to the 2008 AICUZ Study. The study was updated as a result of changes in aircraft operations, including the fielding of C-130J Super Hercules aircraft. The development of the noise contours was done using the DOD NOISEMAP Version 7 computer modeling program. This program generates
noise contours by analyzing average annual day aircraft operations data to develop the noise exposure levels around Dyess AFB.

The DOD recognized definition of an aircraft operation is stated as one takeoff/departure, one approach/landing, or half of a closed pattern. A closed pattern consists of two portions, a takeoff/departure and an approach/landing, i.e., two operations. The DOD recognized definition of a sortie is a single military aircraft flight from the initial takeoff through the termination landing. The minimum number of aircraft operations for one sortie is two operations: one takeoff (departure) and one landing (approach).

From a risk management approach each aircraft operation is defined by a specific action and risk profile such as approach, or departure, landing, or take-off. These actions also occur in some well-defined airspace and area surrounding the runway such as the clear zone, accident potential zones (APZ), or closed pattern area.

The noise contours follow the general direction of approaches to and departures from the runway and extend away from Dyess AFB to the northwest and south.

<table>
<thead>
<tr>
<th>ISSUE NOI-1</th>
<th>Noise from aircraft operations</th>
</tr>
</thead>
<tbody>
<tr>
<td>The aircraft operations that occur at Dyess AFB produce noise that can be heard outside the boundaries of the base, within surrounding communities.</td>
<td></td>
</tr>
</tbody>
</table>

**Compatibility Assessment**

According to the January 2015 Dyess AFB AICUZ Study, there are 27 B-1B aircraft and 28 C-130J aircraft based at Dyess AFB. There are also a wide variety of transient aircraft originating from other installations in the region and around the country that utilize Dyess AFB for flight operations throughout the year. This many generates noise that is heard outside of the base within the surrounding community. As shown on Figure 5.18-2, the noise zones extend over the City of Tye, a small sliver of undeveloped land within the City of Abilene, the community of Caps, and unincorporated Taylor County. The compatibility of land use within the noise contours is further discussed in Issue NOI-2.

Although the AICUZ Study defines various noise zones, this does not mean that noise is confined within those zones. Factors such as weather, type of aircraft, and flight circumstances (e.g., flying outside the normal flight pattern to avoid bird hazards) can cause noise to be louder at some times than other times, and noise does not stop at the noise contour line. It should be noted that the 2013 noise contours reduced in size from the previous contours that were developed in 2007 for the 2008 AICUZ Study. This was a result of changes to the number and types of aircraft and aircraft operations and fluctuations in flight patterns.

Dyess AFB strives to be a good neighbor to its surrounding community and has a dedicated process for receiving and addressing noise complaints and other concerns from the public, which is guided by Air Force Instruction 35-108. According to Dyess AFB’s Noise and Low Flying Aircraft Complaint Worksheet:

“PA [Public Affairs] will handle complaints directly and completely as possible without referring callers to other bases or commands and without dismissing calls when locally assigned aircraft are not involved. To help maintain good media and community relations, PA should provide timely, responsive, and factual answers to aircraft noise complaints working in conjunction with the installation’s aircraft operations and civil engineer offices. PA usually makes a report of the complaints at the Air Operations Board meeting, which is also attended by the community planners. Refer all claims for damages to the Air Force Claims Service Center at 1-877-754-1212 or 937-656-8044.”
Current Dyess AFB Noise Zones

Legend

2013 DNL Noise Contour (dB)

65 DNL
70 DNL
75 DNL
80 DNL
85 DNL

Dyess Air Force Base
County
Community Covered by JLUS
Tye Extraterritorial Jurisdiction
Abilene Extraterritorial Jurisdiction
Other Community

Interstate
Highway
Local Road
Railroad
Runway / Airfield
Water Body
Stream / River

Source: Dyess AFB 2013 AICUZ.

Figure 5.18-2
Dyess AFB’s PA maintains a detailed record of each complaint that is received, even when they are not about noise, and responds directly to each complainant with information to address their concern or question. Oftentimes, complaints are not true complaints, but are concerns about what the activity they witnessed was and if there are any safety hazards associated with it. Sometimes complaints received are about aircraft not stationed at Dyess AFB, but are mistakenly associated with the base. Compared to other Air Force installations in more populated regions, Dyess AFB does not receive many complaints. Between January 2013 and March 2016, 16 complaints were received and recorded using the Low Flying Aircraft Complaint Worksheet. Of these complaints, only five of them were the result of a noise complaint. The others were concerns about low flying aircraft, safety, questions about jet fuel, or curious what activity was being conducted. Residents and land owners who have been involved in the JLUS process and who have attended public workshops are aware of the noise associated with Dyess AFB operations and for the most part do not have any problems with it.

During the first public workshop, held at the Tye Community Center on October 3, 2016, attendees were asked a series of survey questions to get an idea of issues may exist from a public citizen or property owner perspective. This survey was also provided on the project website for 30 days for those who were unable to attend the workshop. This survey was not meant to provide scientific data on the compatibility issues from the public perspective, as it was only a small sampling of the total stakeholder population that lives around Dyess AFB. It was not possible to interview every property owner or resident around Dyess AFB to get their input, so this small sample was used as a small gauge to assess the issues.

A total of 71 respondents completed the survey either at the public workshop or online. Some respondents chose not to answer every question, so not all of the questions received 71 responses. One question that was asked was whether the respondent has contacted Dyess AFB in the past 12 months regarding an issue of complaint. All 69 respondents answered no, indicating that concerns from impacts of Dyess AFB operations on quality of life are low. In response to the question of whether noise from operations at Dyess AFB is an issue for the respondent, 19 percent said yes, 20 percent said rarely, 57 percent said no, three percent said not now, but it could be in the future, and one percent had no opinion.

For future planning purposes, it will be important to consider potential future missions at Dyess AFB. If new aircraft are assigned to Dyess AFB, or if more aircraft of currently assigned aircraft are added, this could result in an increase in the size of the noise contours. Expansion of the noise contours would put a larger amount of land within the noise zones that could be impacted by aircraft noise levels. The 2015 AICUZ Study developed hypothetical noise contours for potential future missions. These estimated noise contours were created by doubling the number of Dyess AFB-based aircraft operations that were used to create the 2013 contours. Some local governments have chosen to incorporate them into local ordinances in order to proactively guide compatible development in a larger area to support any new missions that generate a larger noise contour. The hypothetical noise contours are meant only for planning purposes and would need to be refined in the event of a change in mission, a new noise model and AICUZ Study will be deemed necessary. On the other hand, if future mission changes at Dyess result in the reduction or loss of current aircraft, then the noise contours may get smaller and go over less land. As of December 2016, there are no aircraft scheduled to be removed from or added to Dyess AFB, but it is a possibility in the future as the needs of the US Armed Forces change and basing decisions are made.

**Findings**

- The most recent noise contours were developed in 2013 for the 2015 AICUZ, and were an update to the previous 2007 contours. The update was based on changes in the Dyess AFB mission. The 2013 noise contours reduced in size from the previous contours that were developed in 2007 for the 2008 AICUZ Study

- Existing noise contours go over the populated areas of the City of Tye to the north of Dyess AFB and the Caps community to the south of the base.

- Hypothetical noise contours were created for the Dyess AFB AICUZ to show potential noise contours for future aircraft missions at Dyess
Compatibility Assessment

AFB, based on double the number of annual aircraft operations from the base.

- There are no current plans for a reduction or addition to aircraft at Dyess AFB

<table>
<thead>
<tr>
<th>ISSUE NOI-2</th>
<th>Incompatible / not recommended residential land uses in aircraft noise zones</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>There are existing homes located within the Dyess AFB noise zones. Many of those homes have been there for a very long time and many residents who live there accept the noise.</td>
</tr>
</tbody>
</table>

Compatibility Assessment

The Air Force has published specific land use compatibility guidelines in Air Force Instruction (AFI) 32-7063, which was most recently updated in December 2015, for aircraft noise based on varying amounts of noise identified by noise contours of DNL 65 dB or greater. The impact from noise is experienced at arriving and departing locations, which is typically closest to the ground level and nearest to other types of land uses that may be sensitive to loud noise. Since the intent of the JLUS is to promote land use compatibility and because the recommendations are provided for local governments, the land use compatibility assessment for aircraft noise is based on best practice using the recommended land uses for aircraft noise. Land use compatibility along with notes defining recommended noise level reductions (NLRs) for specific land uses are provided in Table 5.18-1.

While the Air Force Instruction 32-7063 includes a wide variety of common and some uncommon land uses, it does not include every possible land use type. For this reason, if these guidelines are used as a reference for assessing a proposed land use within the noise zones, then the jurisdiction should use available resources and information to make an informed decision as to whether the proposed use would be compatible /

recommended with the military mission, while taking into consideration existing land use, land ownership patterns, land values, previous community experience with aircraft operations, and protecting the existing character and stability of existing land uses. The Standard Land Use Coding Manual provides a much more detailed list and information on specific land uses that fall within the various land use categories.

As discussed in Issue NOI-1, the noise zones for Dyess AFB aircraft operations extend over private land within the surrounding community outside of the base. While the majority of the land within the noise zones is currently open space, agricultural, or vacant, there are some existing structures in the noise zones that are not aligned with the AICUZ suggested recommendations at the various levels of noise generated.

When the City of Abilene was developing its Airport Zoning Ordinance in 2008 and 2009, many concerns were brought up by the local community living south of Dyess AFB, including some property owners who own land or homes in the noise zones. Through discussion and agreement with the City of Abilene, noise regulations within the noise contours was removed from the Airport Zoning Ordinance. The main concerns centered on the potential requirement for noise attenuation construction measures for homes in the noise zones. It was identified during the time that there was no acoustical engineer available in Abilene to assist with noise attenuation measurement, and within the highest noise zones, achieving the recommended noise attenuation level to be compatible with that noise zone is unachievable. Additionally, the costs of such construction measures were of great concern to property owners, especially since most insurance companies will not pay for the materials needed to upgrade homes to reach sound attenuation. Some of the existing property owners around Dyess AFB feel that the proximity to Dyess AFB and the associated noise and operations of the base already limit the desire of property owners to build within the noise zones.
### Table 5.18-1  Air Force Instruction 32-7063 Recommended Land Uses Within Aircraft Noise Zones

<table>
<thead>
<tr>
<th>SLUCM No.</th>
<th>Land Use Name</th>
<th>Suggested Land Use Compatibility</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>DNL 65-69</td>
</tr>
<tr>
<td>10</td>
<td>Residential</td>
<td>N1</td>
</tr>
<tr>
<td>11</td>
<td>Household units</td>
<td>N1</td>
</tr>
<tr>
<td>11.11</td>
<td>Single units: detached</td>
<td>N1</td>
</tr>
<tr>
<td>11.12</td>
<td>Single units: semidetached</td>
<td>N1</td>
</tr>
<tr>
<td>11.13</td>
<td>Single units: attached row</td>
<td>N1</td>
</tr>
<tr>
<td>11.21</td>
<td>Two units: side-by-side</td>
<td>N1</td>
</tr>
<tr>
<td>11.22</td>
<td>Two units: one above the other</td>
<td>N1</td>
</tr>
<tr>
<td>11.31</td>
<td>Apartments: walk-up</td>
<td>N1</td>
</tr>
<tr>
<td>11.32</td>
<td>Apartments: elevator</td>
<td>N1</td>
</tr>
<tr>
<td>12</td>
<td>Group quarters</td>
<td>N1</td>
</tr>
<tr>
<td>13</td>
<td>Residential hotels</td>
<td>N1</td>
</tr>
<tr>
<td>14</td>
<td>Mobile home parks or courts</td>
<td>N</td>
</tr>
<tr>
<td>15</td>
<td>Transient lodgings</td>
<td>N1</td>
</tr>
<tr>
<td>16</td>
<td>Other residential</td>
<td>N1</td>
</tr>
<tr>
<td>20</td>
<td>Manufacturing</td>
<td>Y</td>
</tr>
<tr>
<td>21</td>
<td>Food and kindred products; manufacturing</td>
<td>Y</td>
</tr>
<tr>
<td>22</td>
<td>Textile mill products; manufacturing</td>
<td>Y</td>
</tr>
<tr>
<td>23</td>
<td>Apparel and other finished products; products made from fabrics, leather, and similar materials; manufacturing</td>
<td>Y</td>
</tr>
<tr>
<td>24</td>
<td>Lumber and wood products (except furniture); manufacturing</td>
<td>Y</td>
</tr>
<tr>
<td>25</td>
<td>Furniture and fixtures; manufacturing</td>
<td>Y</td>
</tr>
<tr>
<td>26</td>
<td>Paper and allied products; manufacturing</td>
<td>Y</td>
</tr>
<tr>
<td>27</td>
<td>Printing, publishing, and allied industries</td>
<td>Y</td>
</tr>
<tr>
<td>28</td>
<td>Chemicals and allied products; manufacturing</td>
<td>Y</td>
</tr>
<tr>
<td>29</td>
<td>Petroleum refining and related industries</td>
<td>Y</td>
</tr>
<tr>
<td>30</td>
<td>Manufacturing (continued)</td>
<td>Y</td>
</tr>
<tr>
<td>31</td>
<td>Rubber and misc. plastic products; manufacturing</td>
<td>Y</td>
</tr>
<tr>
<td>32</td>
<td>Stone, clay and glass products; manufacturing</td>
<td>Y</td>
</tr>
<tr>
<td>33</td>
<td>Primary metal products; manufacturing</td>
<td>Y</td>
</tr>
<tr>
<td>SLUCM No.</td>
<td>Land Use Name</td>
<td>Suggested Land Use Compatibility</td>
</tr>
<tr>
<td>----------</td>
<td>------------------------------------------------------------------------------</td>
<td>---------------------------------</td>
</tr>
<tr>
<td></td>
<td></td>
<td>DNL 65-69</td>
</tr>
<tr>
<td>34</td>
<td>Fabricated metal products; manufacturing</td>
<td>Y</td>
</tr>
<tr>
<td>35</td>
<td>Professional scientific, and controlling instruments; photographic and optical goods; watches and clocks</td>
<td>Y</td>
</tr>
<tr>
<td>39</td>
<td>Miscellaneous manufacturing</td>
<td>Y</td>
</tr>
<tr>
<td>40</td>
<td><strong>Transportation, communication and utilities</strong></td>
<td></td>
</tr>
<tr>
<td>41</td>
<td>Railroad, rapid rail transit, and street railway transportation</td>
<td>Y</td>
</tr>
<tr>
<td>42</td>
<td>Motor vehicle transportation</td>
<td>Y</td>
</tr>
<tr>
<td>43</td>
<td>Aircraft transportation</td>
<td>Y</td>
</tr>
<tr>
<td>44</td>
<td>Marine craft transportation</td>
<td>Y</td>
</tr>
<tr>
<td>45</td>
<td>Highway and street right-of-way</td>
<td>Y</td>
</tr>
<tr>
<td>46</td>
<td>Automobile parking</td>
<td>Y</td>
</tr>
<tr>
<td>47</td>
<td>Communication</td>
<td>Y</td>
</tr>
<tr>
<td>48</td>
<td>Utilities</td>
<td>Y</td>
</tr>
<tr>
<td>49</td>
<td>Other transportation, communication and utilities</td>
<td>Y</td>
</tr>
<tr>
<td>50</td>
<td><strong>Trade</strong></td>
<td></td>
</tr>
<tr>
<td>51</td>
<td>Wholesale trade</td>
<td>Y</td>
</tr>
<tr>
<td>52</td>
<td>Retail trade – building materials, hardware and farm equipment</td>
<td>Y</td>
</tr>
<tr>
<td>53</td>
<td>Retail trade – including shopping centers, discount clubs, home improvement stores, electronics superstores, etc.</td>
<td>Y</td>
</tr>
<tr>
<td>54</td>
<td>Retail trade – food</td>
<td>Y</td>
</tr>
<tr>
<td>55</td>
<td>Retail trade – automotive, marine craft, aircraft and accessories</td>
<td>Y</td>
</tr>
<tr>
<td>56</td>
<td>Retail trade – apparel and accessories</td>
<td>Y</td>
</tr>
<tr>
<td>57</td>
<td>Retail trade – furniture, home, furnishings and equipment</td>
<td>Y</td>
</tr>
<tr>
<td>58</td>
<td>Retail trade – eating and drinking establishments</td>
<td>Y</td>
</tr>
<tr>
<td>59</td>
<td>Other retail trade</td>
<td>Y</td>
</tr>
<tr>
<td>60</td>
<td><strong>Services</strong></td>
<td></td>
</tr>
<tr>
<td>61</td>
<td>Finance, insurance and real estate services</td>
<td>Y</td>
</tr>
<tr>
<td>62</td>
<td>Personal services</td>
<td>Y</td>
</tr>
<tr>
<td>SLUCM No.</td>
<td>Land Use Name</td>
<td>DNL 65-69</td>
</tr>
<tr>
<td>-----------</td>
<td>-------------------------------------</td>
<td>-----------</td>
</tr>
<tr>
<td>62.4</td>
<td>Cemeteries</td>
<td>Y</td>
</tr>
<tr>
<td>63</td>
<td>Business services</td>
<td>Y</td>
</tr>
<tr>
<td>63.7</td>
<td>Warehousing and storage</td>
<td>Y</td>
</tr>
<tr>
<td>64</td>
<td>Repair services</td>
<td>Y</td>
</tr>
<tr>
<td>65</td>
<td>Professional services</td>
<td>Y</td>
</tr>
<tr>
<td>65.1</td>
<td>Hospitals, other medical facilities</td>
<td>25</td>
</tr>
<tr>
<td>65.16</td>
<td>Nursing homes</td>
<td>N¹</td>
</tr>
<tr>
<td>66</td>
<td>Contract construction services</td>
<td>Y</td>
</tr>
<tr>
<td>67</td>
<td>Government services</td>
<td>Y¹</td>
</tr>
<tr>
<td>68</td>
<td>Educational services</td>
<td>25</td>
</tr>
<tr>
<td>68.1</td>
<td>Child care services, child development centers, and nurseries</td>
<td>25</td>
</tr>
<tr>
<td>69</td>
<td>Miscellaneous services</td>
<td>Y</td>
</tr>
<tr>
<td>69.1</td>
<td>Religious activities (including places of worship)</td>
<td>Y</td>
</tr>
<tr>
<td>70</td>
<td>Cultural, entertainment and recreational</td>
<td>25</td>
</tr>
<tr>
<td>71</td>
<td>Cultural activities</td>
<td>25</td>
</tr>
<tr>
<td>71.2</td>
<td>Nature exhibits</td>
<td>Y¹</td>
</tr>
<tr>
<td>72</td>
<td>Public assembly</td>
<td>Y</td>
</tr>
<tr>
<td>72.1</td>
<td>Auditoriums, concert halls</td>
<td>25</td>
</tr>
<tr>
<td>72.11</td>
<td>Outdoor music shells, amphitheaters</td>
<td>N</td>
</tr>
<tr>
<td>72.2</td>
<td>Outdoor sports arenas, spectator sports</td>
<td>Y⁷</td>
</tr>
<tr>
<td>73</td>
<td>Amusements</td>
<td>Y</td>
</tr>
<tr>
<td>74</td>
<td>Recreational activities (including golf courses, riding stables, water recreation)</td>
<td>Y</td>
</tr>
<tr>
<td>75</td>
<td>Resorts and group camps</td>
<td>Y</td>
</tr>
<tr>
<td>76</td>
<td>Parks</td>
<td>Y</td>
</tr>
<tr>
<td>79</td>
<td>Other cultural, entertainment and recreation</td>
<td>Y</td>
</tr>
<tr>
<td>80</td>
<td>Resource production and extraction</td>
<td>Y⁸</td>
</tr>
<tr>
<td>81</td>
<td>Agriculture (except livestock)</td>
<td>Y⁸</td>
</tr>
<tr>
<td>81.5-81.7</td>
<td>Agriculture-Livestock farming including grazing and feedlots</td>
<td>Y⁸</td>
</tr>
<tr>
<td>82</td>
<td>Agriculture related activities</td>
<td>Y⁸</td>
</tr>
<tr>
<td>83</td>
<td>Forestry activities</td>
<td>Y⁸</td>
</tr>
</tbody>
</table>
### Compatibility Assessment

<table>
<thead>
<tr>
<th>SLUCM No.</th>
<th>Land Use Name</th>
<th>Suggested Land Use Compatibility</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>DNL 65-69</td>
</tr>
<tr>
<td>84</td>
<td>Fishing activities</td>
<td>Y</td>
</tr>
<tr>
<td>85</td>
<td>Mining activities</td>
<td>Y</td>
</tr>
<tr>
<td>89</td>
<td>Other resource production or extraction</td>
<td>Y</td>
</tr>
</tbody>
</table>

*Source: Air Force Instruction AFI32-7063, Rev. December 2015.*

**Key to Table:**
SLUCM – Standard Land Use Coding Manual, U.S. Department of Transportation

**Notes to Table:**
- **Y** (Yes) – Land use and related structures compatible without restrictions.
- **N** (No) – Land use and related structures are not compatible and should be prohibited.
- **Y** – Yes with restrictions. The land use and related structures generally are compatible. However, see note(s) indicated by the superscript.
- **N** – No with exceptions. The land use and related structures are generally incompatible. However, see note(s) indicated by the superscript.

25, 30, or 35 – The numbers refer to noise level reduction (NLR) levels. NLR (outdoor to indoor) is achieved through the incorporation of noise attenuation into the design and construction of a structure. Land use and related structures are generally compatible; however, measures to achieve NLR of 25, 30, or 35 must be incorporated into design and construction of structures. However, measures to achieve an overall noise reduction do not necessarily solve noise difficulties outside the structure and additional evaluation is warranted. Also, see notes indicated by superscripts where they appear with one of these numbers.

- **DNL** – Day-Night Average Sound Level.
- **Ldn** – Mathematical symbol for DNL.

1. **General**
   a. Although local conditions regarding the need for housing may require residential use in these zones, residential use is discouraged in DNL 65-69 and strongly discouraged in DNL 70-74. The absence of viable alternative development options should be determined and an evaluation should be conducted locally prior to local approvals indicating that a demonstrated community need for the residential use would not be met if development were prohibited in these zones. Existing residential development is considered as pre-existing, incompatible land uses.
   b. Where the community determines that these uses must be allowed, measures to achieve outdoor to indoor NLR of at least 25 decibels (dB) in DNL 65-69 and 30 dB in DNL 70-74 should be incorporated into building codes and be considered in individual approvals; for transient housing, an NLR of at least 35 dB should be incorporated in DNL 75-79.
   c. Normal permanent construction can be expected to provide an NLR of 20 dB, thus the reduction requirements are often stated as 5, 10, or 15 dB over standard construction and normally assume mechanical ventilation, upgraded sound transmission class ratings in windows and doors, and closed windows year round. Additional consideration should be given to modifying NLR levels based on peak noise levels or vibrations.
   d. NLR criteria will not eliminate outdoor noise problems. However, building location, site planning, design, and use of berms and barriers can help mitigate outdoor noise exposure particularly from ground level sources. Measures that reduce noise at a site should be used wherever practical in preference to measures that only protect interior spaces.

2. Measures to achieve NLR of 25 dB must be incorporated into the design and construction of portions of these buildings where the public is received, office areas, noise sensitive areas, or where the normal noise level is low.

3. Measures to achieve NLR of 30 dB must be incorporated into the design and construction of portions of these buildings where the public is received, office areas, noise sensitive areas, or where the normal noise level is low.

4. Measures to achieve NLR of 35 dB must be incorporated into the design and construction of portions of these buildings where the public is received, office areas, noise sensitive areas, or where the normal noise level is low.

5. If project or proposed development is noise sensitive, use indicated NLR; if not, land use is compatible without NLR.
6. Buildings are not permitted.
7. Land use is compatible provided special sound reinforcement systems are installed.
8. Residential buildings require an NLR of 25 dB.
9. Residential buildings require an NLR of 30 dB.
10. Residential buildings are not permitted.
11. Land use that involves outdoor activities is not recommended, but if the community allows such activities, hearing protection devices should be worn when noise sources are present. Long-term exposure (multiple hours per day over many years) to high noise levels can cause hearing loss in some unprotected individuals.
It should also be noted that residential uses within high noise zones, such as those associated with the Dyess AFB AICUZ, may not qualify for federal mortgage insurance according to U.S. Department of Housing and Urban Development (HUD) noise regulations found in Title 24 of the Code of Federal Regulations, Part 518. In many cases, HUD approval requires noise attenuation measures, the Regional Administrator’s concurrence, and/or an environmental impact statement stating that noise attenuation levels were met to achieve set standards.

During the JLUS process, members of the JLUS Technical Advisory Committee and Policy Committee representing property owners from the View / Caps Community publicly stated and documented that they do not agree with many of the recommendations within the AICUZ and that they do not want or believe that land use regulations are needed to address land uses and development within the Dyess AFB noise zones. The View / Caps representatives have voiced many concerns over the years about the City of Abilene’s interpretation and use of the AICUZ as a guidance document instead of a document that provides recommendations. As stated previously, the AICUZ does not include a compatibility assessment of every single type of land use to identify whether it would be incompatible / not recommended or compatible / recommended within the various Dyess AFB noise zones. The original Airport Zoning Ordinance was modeled on the AICUZ recommendations, which were too strict and rigid for the existing character of the area south of Dyess AFB. This was the primary reason why the decision was made to remove noise regulations from the currently adopted Airport Zoning Ordinance.

View / Caps representatives have concerns that the City of Abilene will determine that any land use not specifically identified in the AICUZ will be determined incompatible / not recommended within the noise zones and the owner / developer will have difficulty getting the use approved, if they can at all, because the City will deny the application. This was the case in recent years when an ambulance service operator was looking to purchase a building, which was within the noise zones, to relocate its operations to. The City denied the initial application, as “ambulance service” is not identified in the AICUZ, so the City determined it to be incompatible / not recommended. The ambulance service operator had to pay their own capital expenses to the City of Abilene and go through a lengthy process to get final approval to relocate into the existing structure. The ambulance service was previously located in the Caps community, on FM 707, operating out of rented facilities. The facilities purchased by the ambulance service would move them farther from Dyess AFB, but remain in the Caps community, but located within the accident potential zone. Specific uses should not be automatically determined as incompatible / not recommended just because they are not included in the AICUZ. In the event that a proposed land use is not in the AICUZ, the SLUCM could be consulted as a starting point to assist in the process of reviewing the proposed land use. Since the City of Abilene decided to not include noise as part of the Airport Zoning Ordinance after agreement among stakeholders including View / Caps residents in 2008 and 2009, the AICUZ and SLUCM should not be used to make the ultimate decision on land uses within the Dyess AFB noise zones.

Existing Land Use

City of Abilene

There is a small piece of land within the city limits of Abilene (roughly 15 acres) that is within the DNL 65 dB noise contour on the north side of Dyess AFB. This land is currently undeveloped and is compatible / recommended.

City of Tye

On the north side of Dyess AFB, much of the City of Tye is within the DNL 65 dB or greater noise zones. Any residential development within the DNL 75+ dB noise zones is considered incompatible / not recommended. Mobile homes and recreational vehicles are considered incompatible / not recommended in any noise zones. Single family dwellings are discouraged in DNL 65+ dB noise zones, but are conditionally compatible / recommended in the DNL 65 and 70 dB noise zones as long as noise level reduction measures are used of at least 25 dB in the 65 dB zone and 30 dB in the 70 dB zone are incorporated in the building construction. Single family residential is incompatible / not recommended in DNL 75+ dB noise zones. There are several residential areas in Tye within the noise contours. They are listed as follows.
West of Dyess AFB’s runway along Flamingo Drive, within the DNL 65 to 74 dB noise zones. These are a mix of single family homes and mobile homes.

Northwest of the runway, in the center of the city, centered on Drummond Street, within the DNL 65 to 79 dB noise zones. This is the largest cluster or residential in the city and includes single family homes and mobile homes. Tye Baptist Church is also in this area and is incompatible / not recommended.

Just west of the center of the city, along Indian Creek Drive, within the DNL 65 dB noise zone. These are a mix of single family homes and mobiles homes.

Directly east of the Dyess AFB boundary, within the DNL 65 to 74 dB noise zones. These are a mix of single family homes and mobiles homes.

Tye RV Park, on the north side of Interstate 20 is considered transient lodging and does not have permanent home sites. It is within the DNL 75 dB noise zone.

In the northeast corner of Tye, along Sprinks Road, within the DNL 65 dB noise zone. These are mobile homes. There are several other areas interspersed throughout Tye that are considered incompatible / not recommended according to the Dyess AFB AICUZ. There is some scattered residential throughout the city, outside the areas listed above, which may be conditionally compatible / recommended or incompatible / not recommended depending on the noise zone they are in, and the use of appropriate noise level reduction measures. There are also public / quasi-public land uses, including Rister Park (split between the DNL 70 and 75 dB noise zones), which are incompatible / not recommended in the DNL 75 dB+ noise zones, or conditionally compatible / recommended in the DNL 65 to 74 dB noise zones.

The generalized existing land use within the noise zones on the north side of Dyess AFB and the compatibility of each type of use are illustrated on Figure 5.18-3.

**Taylor County**

There is a residential development north of Tye, in unincorporated Taylor County, that is within the northern edge of the DNL 65 to 69 dB noise zone. These homes are considered conditionally compatible / recommended, provided they incorporate appropriate noise level reduction measures.

The land within the noise zones on the south side of Dyess AFB is all within unincorporated county land, but within the City of Abilene’s extraterritorial jurisdiction. The majority of this land is agricultural, open space, or vacant, which are compatible / recommended. The Petrosmith facility is considered conditionally compatible / recommended in the DNL 75 and 80 dB noise zones due to the type of operations conducted there, office space could incorporate appropriate noise level reduction measures to reduce noise concerns in the future, if they feel it is warranted or needed. The community of Caps includes existing residential development throughout the noise zones, some of which is considered incompatible / not recommended due to the level of noise (residential uses located in the DNL 75+ dB noise zones). Current property owners within the Caps community have stated that they accept the level of noise generated by Dyess AFB operations and have requested that Dyess AFB and the City of Abilene consider them as compatible / recommended because of their acceptance of noise. Many of the property owners have been very involved in this Dyess AFB JLUS process, both at public workshops and serving on the JLUS committees, and are accepting of the noise levels. Further south of Caps, there are some clusters of residential buildings in unincorporated Taylor County within the DNL 65 dB noise zone. The Dyess AFB AICUZ suggests that noise level reduction measures are incorporated into construction if future residential is developed. The acceptance of noise by the current property owners south of Dyess AFB was acknowledged by all entities involved during the Airport Zoning Ordinance 23-319 in 2008-2009. The entities included the City of Abilene, Dyess AFB, Taylor County, and the property owners.

The generalized existing land use within the noise zones on the south side of Dyess AFB and the compatibility of each type of use are illustrated on Figure 5.18-4.
Figure 5.18-3
Existing Land Use Compatibility in Dyess AFB Northern Noise Zones

Legend

2013 DNL Noise Contour (dB)
- 65 DNL
- 70 DNL
- 75 DNL
- 80 DNL
- 85 DNL

Existing Land Use Compatibility Legend

Conditionally Compatible / Recommended
Incompatible / Not Recommended

Residential
Commercial
Industrial
Public/quasi-Public
Open/Low-Density

Source: Dyess AFB AICUZ Study, 2015
Figure 5.18-4
Existing Land Use Compatibility in Dyess AFB Southern Noise Zones
Compatibility Assessment

Zoning

City of Abilene
The undeveloped parcel of land within the DNL 65 dB noise zone is zoned as Agricultural Open Space, which is generally compatible / recommended with noise. The zone does allow residential uses and schools, which are conditionally compatible / recommended provided appropriate sound attenuation measures are used during building construction.

City of Tye
The City of Tye has a zoning ordinance, but it has not adopted airport zoning to address Dyess AFB noise contours as part of it. Tye’s zoning districts are closely related to the existing land use pattern in the city and the ordinance not been updated since 2006. The zoning ordinance allows uses that are incompatible / not recommended with Dyess AFB’s noise zones. A large portion of the land within Tye that is in the noise zones is zoned Agricultural Open Space, which is generally compatible / recommended with the noise zones, except that it allows residential uses, which are not recommended in the DNL 75+ dB noise zones, and would need sound attenuation construction to be compatible / recommended in the DNL 65-74 dB noise zones. Most of the zoning districts in Tye allow residential, making them conditionally compatible / recommended as long as this is taken into account. The biggest concern with Tye’s zoning layout in relation to noise is that it has a Mobile / Modular Home district that allows mobile homes. Mobile homes are incompatible / not recommended in all noise zones due to their construction design that provides minimal noise attenuation. There are three Mobile / Modular home districts within the noise zones. Figure 5.18-S illustrates the zoning districts within the noise zones north of Dyess AFB and the compatibility of each.

Taylor County
Taylor County does not have the authority to zone. Within Abilene’s ETJ, the city has limited authority to create zoning. In 2008, the city considered adopting a zoning overlay for the noise zones within the ETJ as part of the Airport Zoning ordinance. This overlay would have primarily affected property owners within the Caps community, a small residential community that, according to the Texas State Historical Association, was established in 1882, well before Dyess AFB was built. There are still descendants from the original settlers of the community there today, and some families have owned the same property for generations. The existing property owners in Caps, as well as other nearby property owners within the noise zones, publicly stated that they accept the noise generated by Dyess AFB operations, and do not wish to have a noise overlay established. As a result, the City of Abilene made the ultimate decision to remove the noise component from its Airport Zoning ordinance after coordination with Dyess AFB, Taylor County, and property owners. The noise issue within Abilene’s ETJ was resolved and removed in the 2008-2009 after 17 months of working on Airport Zoning Ordinance 23-319.

Since there is no zoning within the noise zones, it is possible that residential uses may be developed within the noise zones in the future that may be within the DNL 75+ dB zone, or without adequate sound attenuation in the DNL 65 to 74 dB zones. While the existing property owners accept the level of noise generated, in the event that vacant land is developed with residential uses in the future or existing residences change ownership, new residents may not be as accepting of the level of noise. There are alternative methods to make future property owners aware of noise impacts that do not require zoning restrictions on future development. These are further described in the Implementation Plan (Chapter 6 of the JLUS Report).

Future Land Use

City of Abilene
The future land use designation for the undeveloped parcel of land within the DNL 65 dB noise zone is Business / Industrial, which would be compatible / recommended. It is unlikely that any intensive use will occur here though due to drainage issues and the proximity to residential development in the City of Tye.

City of Tye
While the City of Tye’s population is projected to increase by almost 20 percent from 2010 to 2050, the actual number of people this represents is only 240, due to the small population of the city (see Chapter 2 of the JLUS Background Report for more information on population and projections). The City of Tye is not anticipated to have major growth in the foreseeable future.
Figure 5.18-5

Zoning Compatibility in Dyess AFB Northern Noise Zones

Legend

2013 DNL Noise Contour (dB)
- 65 DNL
- 70 DNL
- 75 DNL
- 80 DNL
- 85 DNL

Zoning Compatibility Legend

Conditionally Incompatible / Compatible / Not Recommended

SF - Single Family Residence
MF - Multiple Family Residence
MH - Mobile / Modular Home
C1 - Local Business
C2 - General Business
L1 - Light Industrial
H1 - Heavy Industrial
AO - Agricultural Open Space

Source: City of Tye, 2004; City of Abilene, 2010; Dyess AFB, 2015; Matrix Design Group, 2016
Compatibility Assessment

The City of Tye’s future land use map is closely related to the existing land uses in the city, and has not been updated since 2004. Some of the land uses on the future land use map are incompatible / not recommended in the noise zones in which they are located (there is some single family residential and public / semi-public identified within the DNL 75+ dB noise zone), but for the most part the future land use map is conditionally compatible / recommended. The majority of the land is identified as vacant / agricultural, which is typically compatible / recommended in the noise zones, but allows residential uses that support agriculture. Residential uses within the DNL 65-74 dB noise zones would be compatible if built with proper sound attenuation. The future land use does not specify mobile home locations, but the single family residential designation allows mobile homes placed on a single lot and used as a residential dwelling, but mobile homes are incompatible / not recommended within any noise zones. Other land use designations are identified as conditionally compatible / recommended because they allow uses that may be incompatible / not recommended, and should be assessed for compatibility on a case by case basis for future development. Figure 5.18-6 illustrates the future land use designations within the noise zones north of Dyess AFB and the compatibility of each district.

Taylor County
Taylor County does not have the authority to create a future land use map. Abilene has a future land use map within its comprehensive plan that recommends future land uses of restricted open space and low density residential within the ETJ portions of the County south of Dyess AFB. The map does not cover all of the land within the noise zones and is intended to be a graphical representation of a future land use concept, and not a firm designation of land uses.

Metropolitan Planning Organization Thoroughfare Plan
Another item of that adds to concern for potential future growth within the Dyess AFB noise zones is the Abilene Metropolitan Planning Organization (MPO) and City of Abilene’s Thoroughfare Plan. The Thoroughfare Plan serves as the City’s plan for guiding transportation system development and identifies the existing and proposed transportation system of freeways, arterials, collectors, and local streets in and around Abilene. The Thoroughfare Plan has numerous proposed arterial, collector, and minor arterial roads on every side of Dyess AFB, and proposes to turn FM 707 on the west side of Dyess AFB into an expressway. Not only would these road improvements bring additional traffic through the area, but they may encourage future development to take advantage of close access to upgraded transportation infrastructure. The existing and proposed roadway infrastructure around Dyess AFB is shown on Figure 5.18-7. Consideration for how new roadway infrastructure around Dyess AFB may contribute to future growth should be taken when updating the Thoroughfare Plan.

Findings

- The majority of the land in the noise zones is compatible / recommended, but there is some residential development within the DNL 75+ dB noise contours that is incompatible / not recommended.

- Tye does not consider Dyess AFB noise zones in their zoning ordinance or future land use map.

- Tye has three areas of Mobile / Modular Home zoning within the noise zones. Mobile homes are incompatible / not recommended in any noise zones due to their construction design that provides minimal noise attenuation.

- The City of Abilene considered establishing a noise zone overlay in their Airport Zoning ordinance, but the residents within the ETJ stated that they accept the level of noise from Dyess AFB and did not want to have the zoning overlay, so it was not adopted. This acceptance of noise levels was reached after 17 months of working on Airport Zoning Ordinance 23-319 in 2008-2009, with the involvement, participation, and coordination of the City of Abilene, Dyess AFB, Taylor County, and the property owners.

- The Abilene MPO Thoroughfare Plan proposes a variety of new roadway infrastructure around Dyess AFB, including turning FM 707 into an expressway, which may induce future growth around the base that could be impacted by aircraft operations such as noise.
Figure 5.18-6
Future Land Use Compatibility in Dyess AFB Northern Noise Zones
Figure 5.18-7  Abilene MPO Thoroughfare Plan Proposed Roadway Infrastructure Around Dyess AFB
5.19 Public Trespassing (PT)
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 an installation.

<table>
<thead>
<tr>
<th>ISSUE</th>
<th>Accidental trespass by motorists</th>
</tr>
</thead>
<tbody>
<tr>
<td>PT-1</td>
<td>Motorists using GPS services to get directions to commercial amenities such as shopping, restaurants, or banks sometimes accidentally try to enter Dyess AFB without proper credentials. Certain GPS services direct users to commercial amenities that are located on-base as being the closest location.</td>
</tr>
</tbody>
</table>

Compatibility Assessment
Dyess AFB commonly experiences unauthorized civilians attempting to enter the installation using navigational assistance (services such as Google Maps or GPS on their cell phones) to reach services such as a store, restaurant, or bank, despite navigational aids cautioning that their destination requires access using restricted roads. An icon usually denotes whether entering into a restricted area. The restriction icon dependent on the services used may not be easily noticed or labeled when a driver is not viewing the step-by-step directions. The unauthorized citizens have been instructed to turn around once arriving at either entry gate. According to Dyess AFB personnel, these instances occur about once every two months. As noted in Roadway Capacity Issue RC-1, Dyess AFB can have wait times at the gate during peak travel times or during times of increased security measures. Increased wait times resulting from unauthorized vehicle processing can impact timely base personnel access.

Findings
- Icons used may be difficult to notice that the directions go through restricted areas
- The driving public may be directed on to Dyess AFB for services by GPS navigation applications
- Unauthorized vehicle processing increases entry gate wait times
5.20 Roadway Capacity (RC)
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.

As urban development expands into rural areas, roads once used primarily to provide access for agricultural uses and limited local traffic begin to function as urban major arterial roadways. These once rural roads often become the main transportation corridors for all types of traffic – from residential to commercial trucking – and can assist or impede access to military installations. As transportation systems grow and provide more capacity, these facilities induce and encourage growth as rural areas become more accessible.

<table>
<thead>
<tr>
<th>ISSUE RC-1</th>
<th>Congestion during peak travel times</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>During peak times, there may be up to or more than 20 vehicles stacked up at the gate to enter Dyess AFB. This can cause delays in getting onto the base due to the time it takes to process drivers through security.</td>
</tr>
</tbody>
</table>

Compatibility Assessment
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 entry gates to access the base. A single authorized vehicle entering the base does not typically take a long time to process with the proper credentials; however, the capacity of the main gate associated with times of heavy traffic flow onto Dyess AFB may create congestion entering the main gate. Intersections that lead to the gates such as Arnold Blvd are signalized, which adds to traffic congestion, particularly during the morning or evening rush hours. In February 2016 the Abilene Chamber of Commerce Military Affairs Committee requested $200,000 and was approved in assistance to fund part of a $1.75 million grant that would improve security and traffic flow at the entrance gate.

Due to the location of the main gate off of Arnold Blvd within Dyess AFB and its distance from Arnold Blvd, backups at the gate rarely impact civilian traffic.

Findings
- The queuing lane on Dyess AFB property is long enough to handle gate backups, so Dyess AFB traffic rarely backs up far enough to impact civilian traffic on Arnold Blvd.

<table>
<thead>
<tr>
<th>ISSUE RC-2</th>
<th>Prohibited truck travel on Air Base Road</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Commercial trucks bringing materials to Dyess AFB sometimes use Air Base Road, which is incompatible with trucks because the road was not constructed to support heavy vehicles.</td>
</tr>
</tbody>
</table>

Compatibility Assessment
Air Base Road runs along the north side of Dyess AFB and is a 21-foot wide local road fronted by single-family residences. Dyess AFB Commercial Vehicle Inspection (CVI) relocated to the Tye gate on the north side of the base, which can be accessed from Air Base Road to the west or Military Drive to the east. Due to the relocation of the CVI to this location, an increase of commercial trucks use Air Base Road that runs along the north side of the base. Air Base Road is incompatible with commercial vehicles and has signage at the intersection of Air Base Road and Scott Street that states “No Trucks” on Air Base Road. Air Base Road has shown deterioration from increased use by commercial trucks and requires improvements.

Military Drive, the roadway from Arnold Blvd to the Tye Gate has been upgraded as a joint project by the Texas Department of Transportation and Abilene Metropolitan Planning Organization to accommodate increased commercial truck use.

Findings
- Air Base Road is a local road that traverses residential neighborhoods and is not designed to accommodate large commercial vehicles.
- There is signage along Air Base Road that states trucks are prohibited.
5.21 Safety (SA)

Safety zones are areas in which development should be more restrictive regarding use and concentrations of people due to the higher risks to public safety. Issues to consider include aircraft accident potential zones.

Military installations often engage in activities or contain facilities that, due to public safety concerns, require special consideration by local jurisdictions when evaluating compatibility. It is important to regulate land use near military airfields to minimize risk from potential aircraft mishaps and to reduce air navigation hazards. To help mitigate potential issues, the Department of Defense (DOD) has delineated Clear Zones (CZ) and Accident Potential Zones (APZ) in the vicinity of airfield runways. APZs are usually divided into APZ I and APZ II. Each zone was developed based on the statistical review of aircraft mishaps. Studies show that most mishaps occur on or near the airfield, predominately along its extended centerline.

Key Terms

**Air Operations Area (AOA).** The Air Operations Area is an area used or intended to be used for landing, takeoff, or surface maneuvering of aircraft, including the runway and associated paved areas.

**Accident Potential Zone I (APZ I).** APZ I is an area beginning at the end of each clear zone (see definition below) and continuing out to a length of 5,000 feet long by 3,000 feet wide. This area has a lower potential for mishaps in comparison to the clear zone and therefore has less prohibitive development restrictions recommended.

**Accident Potential Zone II (APZ II).** APZ II is an area that begins at the end of each APZ I and extends an additional 7,000 feet long by 3,000 feet wide. This APZ can also be curbed as the flight patterns are a consideration in designating this APZ. Again, the potential for mishaps in this area is reduced further in comparison to the clear zone and APZ I, and with this, some additional development types are allowed.

**Bird / Wildlife Aircraft Strike Hazard (BASH).** BASH refers to the likely occurrence of a collision between an animal (usually a bird) and an aircraft.

**BASH Relevancy Area.** The BASH Relevancy Area is a five-statute mile area radiating from the AOA. The FAA has defined this as an area where BASH incidences are likely to occur due to the types of flying operations that occur near the airfield; such operations are typically at slower speeds and lower altitudes increasing the risk for a strike.

**Clear Zone (CZ).** The CZ is the area with the highest statistical potential of an aircraft mishap. As the name implies, the DOD recommends that this area be kept clear of all development or structures. A CZ begins at the physical end of a runway and extends outward, covering an area that is 3,000 feet wide by 3,000 feet long.

**Compatibility Assessment**

The Bird/Wildlife Aircraft Strike Hazard (BASH) prevention program was implemented by the DOD to address the reduction of wildlife hazards through proactive mitigation of resident bird and wildlife species and proximity to migratory routes. Bird movements both daily and seasonal, especially in the months of April and October, increase the risk of potential hazards. The BASH Team assists in bird hazard reduction Air Force-wide. Wildlife entering the base and causing issues with regular activities on the base is manageable. BASH Team personnel are trained in bird control and have experience in wildlife ecology, land management, and flight operations. They also have current information on authorized control equipment and techniques.

The United States Air Force has developed a Bird Avoidance Model (BAM) using Geographic Information System (GIS) technology as an essential tool for analysis and correlation of bird habitat, migration, and breeding characteristics, combined with key environmental, and man-made geospatial data. This online tool is known as the US Avian Hazard Advisory System (USAHAS).
Compatibility Assessment

Over the past 20 years more than 69,000 wildlife-aircraft strikes have occurred with United States Air Force aircraft that killed 23 aviators, destroyed 12 aircraft, and caused more than $400 million worth of equipment damage.

At Dyess AFB, this number has been a small fraction of the total for the whole Air Force. Between fiscal years 2007 and 2016, there were a total of 533 bird strike mishaps at Dyess AFB, resulting in $3,818,625 worth of damage to aircraft. This total does not include any costs associated with injuries to pilots or aircrew. Table 5.21-1 identifies the number of strikes and total aircraft damage costs for each year from fiscal year 2007 to 2016. While there were many bird strikes throughout these years, the majority of them did not result in damage. However, many of the strikes that did result in damage were costly, ranging from $46 to $799,897 for a single incident. A wide variety of birds and other animals were recorded for causing strikes on aircraft, but the most damaging species are generally larger species. Black vultures, turkey vultures, sandhill cranes, and mallards were the species that accounted for the costliest damages to aircraft.

Table 5.21-1  BASH Strikes and Damage at Dyess AFB from Fiscal Year 2007 to 2016

<table>
<thead>
<tr>
<th>Fiscal Year</th>
<th>Number of mishaps</th>
<th>Total mishap cost (excluding injury cost)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2007</td>
<td>62</td>
<td>$438,529</td>
</tr>
<tr>
<td>2008</td>
<td>65</td>
<td>$805,351</td>
</tr>
<tr>
<td>2009</td>
<td>82</td>
<td>$49,355</td>
</tr>
<tr>
<td>2010</td>
<td>54</td>
<td>$504,282</td>
</tr>
<tr>
<td>2011</td>
<td>53</td>
<td>$808,633</td>
</tr>
<tr>
<td>2012</td>
<td>48</td>
<td>$734,295</td>
</tr>
<tr>
<td>2013</td>
<td>46</td>
<td>$341,588</td>
</tr>
<tr>
<td>2014</td>
<td>41</td>
<td>$217</td>
</tr>
<tr>
<td>2015</td>
<td>41</td>
<td>$128,326</td>
</tr>
<tr>
<td>2016</td>
<td>41</td>
<td>$8,049</td>
</tr>
</tbody>
</table>

Source: Dyess AFB, February 2017

There was one specific area of concern identified during the JLUS that could cause increased BASH activity close to the airfield. There is a small privately-owned pond just east of Dyess AFB’s northern boundary in the City of Tye. During the course of the

JLUS, personnel at Dyess AFB noticed and staff at the City of Tye noticed that the property owner was increasing the size of the pond and installed what appears to be a fishing platform at the edge of the pond. Dyess AFB staff personnel have concerns that expansion of this water body, although small, could increase bird activity close to the runway, especially if the pond is stocked with fish. This pond is less than half a mile away from the end of the runway and is within the BASH Relevancy Area. Figure 5.21-1 illustrates the five-mile BASH Relevancy Area and other areas around Dyess AFB that have an increased likelihood of attracting birds and creating BASH concerns.

Proximity of private pond to Dyess AFB runway

Source: Google Maps, Matrix Design Group
Figure 5.21-1
BASH Hazards
Findings

- The Air Force’s Bird Avoidance Model and US Avian Hazard Advisory System are important tools for monitoring bird activity and bird strikes around airfields.

- Between fiscal years 2007 and 2016, there were a total of 533 bird strike mishaps at Dyess AFB, resulting in $3,818,625 worth of damage to aircraft, not including costs associated with injuries to pilots or aircrew.

- Large bird species such as black vultures, turkey vultures, sandhill cranes, and mallards were the species that accounted for the costliest damages to aircraft at Dyess AFB.

- A property owner in Tye, adjacent to the northeastern boundary of Dyess AFB, has expanded their private pond, which may become a BASH concern, especially if it is stocked with fish.

Compatibility Assessment

A CZ is at the end of each active DOD runway. Development is not recommended in the CZ due to safety concerns per the Air Force land use guidance in Air Force Instruction 32-7063 within the clear zone due to safety concerns. A property owner adjacent to the north clear zone has renovated their residence and constructed a garage addition that has extended into a small part of the CZ on land owned by the DOD. This development resulted from an incorrect property boundary survey that misrepresented the property boundary indicating the location of the expansion of the private property onto Dyess AFB property. The development of the garage structure within the CZ is an incompatible / not recommended use and adds a safety concern for potential accidents.

Findings

- Air Force Instruction 32-7063 recommends that no development occur within airfield CZs.

- An incorrect property boundary survey resulted in a private property owner building an addition to their home partially on Dyess AFB property within the CZ.
5.22 Scarce Natural Resources (SNR)
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.

Findings
There were no issues identified for Scarce Natural Resources for the Dyess AFB JLUS.
5.23 **Vertical Obstructions (VO)**
Vertical obstructions are created by buildings, trees, structures, or other features that may encroach into the navigable airspace or impede line-of-sight radar signals used by the military. These obstructions can be a safety hazard to both the public and military personnel and potentially impact military readiness.

Vertical obstructions can compromise the value of low-level flight training by limiting the areas where such training can occur. These obstructions can include a range of items from man-made, such as telephone poles, utility transmission towers, and radio antennas, to natural, such as tall trees and land features. Vertical obstructions can also interfere with radar transmissions, compromising the integrity of data transmission between the transmitter and receiver. Though most critical near the transmitter, the geographic area impacting the transmissions, or radar viewshed, can be broad depending on the distance between the transmitter and receivers.

**Key Terms**

**Imaginary Surfaces.** The term imaginary surface refers to the areas surrounding a heliport or airfield that must be kept clear of objects that might pose a safety threat to aviation activities. A man-made or natural object that projects above an imaginary surface is an obstruction.

**Vertical Obstructions.** Vertical obstructions are objects or structures that exceed a specified height above ground level and extend into airspace. Vertical obstructions may be created by buildings, trees, structures, or other features that are of greater height than, and encroach into, the navigable airspace used for military operations (aircraft approach-departure surfaces, transitional surfaces, as well as military training or flight routes). These can present a safety hazard to both the public and military personnel and potentially impact military readiness.

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**Technical Background**

In relation to flight operations from an airport (military or civilian), vertical obstructions are addressed through compliance with Federal Regulation Title 14 Part 77, which establishes standards and notification requirements for objects affecting navigable airspace. Commonly referred to as Part 77 compliance, this regulation provides details to evaluate the potential for a vertical obstruction based on the elevation of the airfield, the height and resulting elevation of the new structure or facility, and the location of the structure or facility in relation to the airfield in question.

To determine when structures or facilities should be evaluated for vertical obstruction, Part 77 states the following requirements for notifying the FAA:

§77.9 - Any person/organization who intends to sponsor any of the following construction or alterations must notify the Administrator of the FAA:

- Any construction or alteration exceeding 200 feet above ground level.

Any construction or alteration:

- within 20,000 feet of a public use or military airport which exceeds a 100:1 surface from any point on the runway of each airport with at least one runway more than 3,200 feet.

- within 10,000 feet of a public use or military airport which exceeds a 50:1 surface from any point on the runway of each airport with its longest runway no more than 3,200 feet.

- within 5,000 feet of a public use heliport which exceeds a 25:1 surface.

Any highway, railroad, or other traverse way whose prescribed adjusted height would exceed the above noted standards.

When requested by the FAA:
Any construction or alteration located on a public use airport or heliport regardless of height or location.

Part 77 also identifies the height at which an object may be considered an obstruction at a designated distance:

§77.17- Obstruction standards.

(a) An existing object, including a mobile object, is, and a future object would be an obstruction to air navigation if it is of greater height than any of the following heights or surfaces:

(1) A height of 499 feet above ground level at the site of the object.

(2) A height that is 200 feet above ground level or above the established airport elevation, whichever is higher, within three nautical miles of the established reference point of an airport, excluding heliports, with its longest runway more than 3,200 feet in actual length, and that height increases in the proportion of 100 feet for each additional nautical mile from the airport up to a maximum of 499 feet.

(3) 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.

(4) 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.

(5) The surface of a takeoff and landing area of an airport or any imaginary surface established under § 77.19, 77.21, or 77.23. However, no part of the takeoff or landing area itself will be considered an obstruction.

(b) Except for traverse ways on or near an airport with an operative ground traffic control service furnished by an airport traffic control tower or by the airport management and coordinated with the air traffic control service, the standards of paragraph (a) of this section apply to traverse ways used or to be used for the passage of mobile objects only after the heights of these traverse ways are increased by:

(1) 17 feet for an Interstate Highway that is part of the National System of Military and Interstate Highways where overcrossings are designed for a minimum of 17 feet vertical distance.

(2) 15 feet for any other public roadway.

(3) 10 feet or the height of the highest mobile object that would normally traverse the road, whichever is greater, for a private road.

(4) 23 feet for a railroad.

(5) For a waterway or any other traverse way not previously mentioned, an amount equal to the height of the highest mobile object that would normally traverse it.

Apart from the Part 77, the FAA has developed imaginary surfaces around runways to determine how structures and facilities are evaluated as to whether they pose a vertical obstruction relative to the surrounding airspace. 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 runway classification. Figure 5.23-1 illustrates all the imaginary surfaces of a runway and the heights and ratios that buildings and structures are evaluated for vertical obstructions.
**Approach-Departure Clearance Surface.** This surface is symmetrical about the runway centerline extended, begins as an inclined plane (glide angle) 200 at the end of the primary surface of the centerline elevation of the runway end, and extends for 50,000 feet. The slope of the approach-departure clearance surface is 50:1 along the extended runway (glide angle) centerline 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 start of the glide angle. The width of this surface at the runway end is 2,000 feet; it flares uniformly, and the width at 50,000 feet is 16,000 feet.

**Inner Horizontal Surface.** This surface is a plane, oval in shape at a height of 150 feet above the established airfield elevation. It is constructed by scribing an arc with a radius of 7,500 feet above the centerline at the end of the runway and interconnecting these arcs with tangents.

**Conical Surface.** This is an inclined 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.

**Outer Horizontal Surface.** This surface is a plane located 500 feet above the established airfield elevation. It extends for a horizontal distance of 30,000 feet from the outer periphery of the conical surface.

**Transitional Surfaces.** These surfaces connect the primary surfaces, Clear Zone surfaces, and approach-departure clearance surfaces to the outer horizontal surface, conical surface, other horizontal surface, or other transitional surfaces. The slope of the transitional surface is 7:1 outward and upward at right angles to the runway centerline. To determine the elevation for the beginning of the transitional surface slope at any point along the lateral boundary of the primary surface, including the CZ, draw a line from this point to the runway centerline. This line will be at right angles to the runway axis. The elevation at the runway centerline is the elevation for the beginning of the 7:1 slope.

There are some structures located on Dyess AFB that could appear to be vertical obstructions around the...
The Air Force has a fairly elaborate obstruction identification and management program that identifies deficiencies in the airfield’s compliance with planning and design criteria found in UFC 3-260-01, Airfield and Heliport Planning and Design. Much of this criteria is focused on the imaginary surfaces, but it also includes airfield grading, clearance to fixed or mobile obstacles, etc. The UFC requires the categorization of deficiencies as:

- **Permissible Deviations**: These are primarily equipment or operational requirements that violate the imaginary surfaces, but must do so because they are necessary for the functioning of the airfield. Examples include above ground lighting, navigation systems, and weather systems. Components are detailed with specific location and construction criteria to make the environment as safe as possible.

- **Exemptions**: These are facilities or systems, which were constructed under less stringent standards. Exemptions may continue in service so long as they do not present an unacceptable risk. Deficiencies on Dyess AFB classified as exemptions are primarily associated with the drainage system which does not comply with current grading criteria.

- **Waivers**: Waivers ask permission to violate current criteria. Dyess AFB currently has two airfield waivers. One for fire extinguishers and wheel chocks positioned in the graded area of the clear zone and one for jet blast safe distances to taxiing aircraft on the B-1 parking apron. Both are operational in nature having to do with safety issues specific to the B-1.

Dyess AFB does not have any towers other than navigation aids that violate an imaginary surface. Its communication towers, water tower, air traffic control tower and apron light towers all underlie the inner horizontal surface.

### Compatibility Assessment

**Topography in the imaginary surfaces**

Topographic features (bluffs) southwest of Dyess AFB are within the imaginary surfaces. Any development on the bluffs that is within the imaginary surfaces would create a vertical obstruction.

**Dyess AFB Joint Land Use Study**

** ISSUE VO-1  

**Topography in the imaginary surfaces**

Topographic features (bluffs) southwest of Dyess AFB are within the imaginary surfaces. Any development on the bluffs that is within the imaginary surfaces would create a vertical obstruction.

**Compatibility Assessment**

Airfield protection known as imaginary surfaces address obstructions in proximity to an airfield and apply to the height of all vertical structures or objects that may pose a safety risk to pilots and aircraft. Vertical structures or objects within these areas can create hazards to flight operations. The imaginary surface heights are based on the elevation of the airfield. Dyess AFB’s airfield is built at a lower elevation than the surrounding land, which impacts the associated imaginary surfaces and heights of objects within them.

The height of some of the bluffs to the southwest of Dyess AFB in Taylor County (west of Buffalo Gap) penetrate the imaginary surfaces. There are currently three wind turbines on the bluffs that also penetrate the imaginary surfaces. Figure 5.23-2 shows the locations of these wind turbines and where the bluffs penetrate the imaginary surfaces. The bluffs that are southwest of Dyess AFB have been very popular with wind energy development due to their height, high wind energy potential, and proximity to the city.

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;

- Uses that would attract birds or waterfowl, such as landfills or large water features (ponds, lakes, etc.).

As part of its Airport Zoning Ordinance, the City of Abilene established overlay zones for the Dyess AFB imaginary surfaces. In accordance with Texas Local Government Code § 241.001, et seq., as amended, the
imaginary surfaces overlay zones apply within the entirety of the Airport Hazard Area surrounding Dyess AFB, including land outside of the city’s ETJ. The zoning ordinance allows the construction of an individual single-family residential structure, including manufactured housing, to have a maximum height no greater than 35 feet if it penetrates an imaginary surface. However, it is unlikely that such development would occur on the bluffs southwest of Dyess AFB (the only topography that penetrates the imaginary surfaces).

Findings

- Dyess AFB’s airfield is built at a lower elevation than the surrounding land, which impacts the associated imaginary surfaces and heights of objects within them.

- The bluffs to the southwest of Dyess AFB penetrate the imaginary surfaces and have three wind turbines on them that are also within the imaginary surfaces.

- The City of Abilene’s Airport Zoning Ordinance established a zoning overlay to regulate height within the imaginary surfaces, including land outside the city’s ETJ. The ordinance allows residential uses up to 35 feet in height if the property penetrates the imaginary surfaces.
Figure 5.23-2

Topographic Encroachment Into Imaginary Surfaces

Legend
- Incompatible Wind Turbine
- Wind Turbine
- Topographic Encroachment

Imaginary Surfaces
- Primary Surface
- Approach/Departure Clearance Surface (50:1)
- Approach/Departure Clearance Surface (Horizontal)
- Inner Horizontal Surface
- Conical Surface (20:1)
- Outer Horizontal Surface
- Transitional Surface (7:1)

Source: Dyess AFB 2013 AICUZ. USGS 2016.
Compatibility Assessment

<table>
<thead>
<tr>
<th>ISSUE VO-2</th>
<th>No cell tower regulations</th>
</tr>
</thead>
<tbody>
<tr>
<td>The City of Tye and Taylor County do not currently have regulations for siting cell towers, except when a tower meets the criteria for a Part 77 review. This can potentially lead to the development of vertical obstructions within the imaginary surfaces.</td>
<td></td>
</tr>
</tbody>
</table>

Compatibility Assessment

Towers and antennas for cellular communications can exceed 500 feet in height which can impact aircraft operations within the imaginary surfaces. Regulations for controlling the height and location of structures such as a communications tower, establish land use controls which provide a degree of safety and security to the general public and aircraft pilots to prevent an aircraft mishap. The City of Tye’s zoning ordinance does not have a height limit on cell towers, and they are excluded from the height regulations in the zoning districts.

Tye is located in the imaginary surfaces for Dyess AFB’s airfield, which brings additional compatibility concerns. Tye’s zoning ordinance does not address Dyess AFB’s imaginary surfaces. The zoning ordinance allows structure heights of 100 feet in the Light Industrial and Heavy Industrial zones. Some of these zones are close enough to the runway for a 100-foot structure to penetrate the imaginary surfaces and cause an obstruction. The terrain in this area is also higher than airfield elevation exacerbating the obstruction issue.

Taylor County does not have the authority to regulate cell tower heights in unincorporated areas. This could result in damages to federal and private property, delays in mission training activities, potentially lost opportunity for Dyess AFB to be considered for additional missions in the future and in a worst case, personal injury or casualties. This could mean potential loss of economic benefit from mission opportunities.

Although the City of Abilene, has adopted regulations regarding structure heights within imaginary surfaces and a requirement for FAA determination, developers may not be aware of the regulations, particularly those outside the city limits of Abilene. They may propose plans for a structure or use, such as a communications tower, that could infringe upon one or more imaginary surface. Such a proposal would be detected by FAA obstruction evaluation which would include review by Dyess or by local government staff development application review, but it would also be important to ensure that local government staff reviewers are properly trained in how to determine when a structure is a vertical obstruction. In the Dyess AFB AICUZ it states a recommendation for proposals of tall structures be monitored to ensure that new construction will not pose a hazard to navigational airspace.

Findings

- The City of Tye’s zoning ordinance does not have a height limit on cell towers.
- Tye’s zoning ordinance does not address imaginary surfaces and allows heights of 100 feet in the Light Industrial and Heavy Industrial zones, which could allow development that penetrates the imaginary surfaces.
- Taylor County does not have the authority to regulate cell tower heights in unincorporated areas.
- The City of Abilene has formalized cell tower regulations though developers may not be aware of them.
5.24 Vibration (V)
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.

<table>
<thead>
<tr>
<th>ISSUE V-1</th>
<th>Vibration caused by aircraft operations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Areas around Dyess AFB sometimes experience vibration from aircraft operations.</td>
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</tr>
</tbody>
</table>

Compatibility Assessment
It is not uncommon to experience vibration resulting from military aircraft operations near Air Force bases. The vibration experienced around Dyess AFB is typically due to low frequency aerodynamic noise from the B-1B aircraft.

Vibrations are common with jet aircraft operations such as, the B-1B, and are magnified when combat departures are planned, which is a takeoff from the runway followed immediately with a hard bank to either side until the aircraft reaches its operational altitude. The combat departure is used to reduce the enemy’s ability to gain visual lock onto an aircraft by shrinking the area at which the aircraft ascends. Homes and businesses within high decibel noise zones (especially peak noise) are more likely to experience vibrations due to aircraft operations. While both high and low frequencies create noise, only low frequency noise causes vibration. Low frequencies from the aerodynamics create high energy noise that causes vibration.

Studies have been conducted on the potential for structural damage resulting from vibration. Unlike high frequency sounds, low-frequency sounds cannot be blocked by solid objects. When low frequency sound causes vibration exceeding 120 dBP (unweighted peak noise), 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. The maximum decibel level of a combat departure of a B-1B is around 120 dBP and declines as the aircraft climbs to higher altitudes. Dyess AFB utilizes maximum efficiency to conduct combat departures during the daytime primarily between 7AM and 10PM to limit occurrences at night.

During the first public workshop, held at the Tye Community Center on October 3, 2016, attendees were asked a series of survey questions to get an idea of issues may exist from a public citizen or property owner perspective. This survey was also provided on the project website for 30 days for those who were unable to attend the workshop. This survey assisted in getting input on the compatibility issues from the public perspective, while input from other stakeholder perspectives were obtained through discussions with the Policy Committee and Technical Advisory Committee during committee meetings. It was not possible to interview every property owner or resident around Dyess AFB to get their input, so the surveys that were completed at the public workshop and online were used as a representative sample to gauge and assess the issues from a public perspective.

A total of 71 respondents completed the survey either at the public workshop or online. Some respondents chose not to answer every question, so not all of the questions received 71 responses. One question that was asked was whether the respondent thinks that vibration from Dyess AFB operations is a nuisance to the community. Thirteen percent of respondents answered yes, 31 percent answered yes, but only occasionally, four percent answered not now, but maybe in the future, 47 percent answered no, and four percent answered they did not know.

Findings
- Residents experience higher than the usual amount of vibration from B-1B combat departures at Dyess AFB.
- Low frequency sound is the cause of vibration from mission activities.
5.25 **Water Quality / Quantity (WQQ)**

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 agriculture and industrial use is also considered.

**Key Terms**

*Groundwater.* Groundwater is water held underground in the soil or in pores and crevices in rock.

*Point-Source Pollution.* This term refers to water pollution that comes from a single, discrete place, such as a factory drainage pipe.

*Wetlands.* Wetlands are areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support a prevalence of vegetation typically adapted for life in saturated soil conditions. Jurisdictional wetlands are those that are regulated by the US Army Corps of Engineers under Section 404 of the Clean Water Act.

<table>
<thead>
<tr>
<th>ISSUE WQQ-1</th>
<th>Flooding on-base</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>A large portion of Dyess AFB lies within the 100-year floodplain and parts of the base experience flooding during heavy rains. This can impact mission operations if flooding occurs in areas such as the runway.</strong></td>
<td></td>
</tr>
</tbody>
</table>

**Compatibility Assessment**

Little Elm Creek flows off-base from the south through Dyess AFB to the east. Low-lying areas along Little Elm Creek in the south and east are currently in the 100-year floodplain. On the west side of Dyess AFB an off-base drainage way leads into Dyess AFB towards the Landing Zone and Drop Zone near the runway. At the southeastern portion of Dyess AFB there is a pond off-base that creates a 100-year floodplain leading onto the base near the southern part of the runway.

The floodplain, as shown on Figure 5.25-1, includes lowland and flat areas adjoining inland waterways that are subject to a one percent or greater chance of flooding in any given year, otherwise known as the 100-year floodplain. The 100-year floodplain is a significant natural constraint to future development, planning, and base missions at Dyess AFB through flood hazards and other safety issues. Flooding on-base can create significant issues for Dyess AFB mission operations if flooding occurs on the runway.

Dyess AFB sits at a lower elevation than the surrounding land, making it more susceptible to flooding. Currently the surrounding community does not have much impact on flooding that occurs on Dyess AFB.

**Findings**

- Multiple areas on Dyess AFB are within the 100-year floodplain
- The floodplains located on Dyess create constraint to future development and mission operations possibilities.
- Dyess AFB sits at a lower elevation than the surrounding land, making it more susceptible to flooding.
- The current amount of development around Dyess AFB does not have a major impact on flooding at Dyess AFB.
Legend

- 100 Year Flood Zone (A, AE, AO)
- 500 Year Flood Zone
- Stream / River
- Gate
- Installation Structure
- Housing
- Other
- Dyess Air Force Base
- Community
- Highway
- Local Road
- Railroad


5-25.1
Flood Zones On Dyess AFB
Compatibility Assessment

ISSUE WQQ-2
Off-base flooding
During heavy rain events, water from Dyess AFB traverses across the base boundary and Airbase Road into adjacent areas within the City of Tye, causing flooding.

Compatibility Assessment
The northeastern boundary of Dyess AFB is close to a small development of residential land comprising single-family homes. There is a drainage area just across Dyess AFB’s fence that abuts Air Base Road, across the street from these homes. Ponding sometimes occurs in this drainage area, but during heavy rain events, water flows from Dyess AFB and increases the ponding, sometimes resulting in flooding. Depending on the amount of rain, this flooding may cross Air Base Road and create flooding in the area of these homes. During the JLUS process, the City of Tye expressed concerns about the flooding from Dyess AFB along the northeastern boundary of the base. This flooding may be due to blocked or unmaintained drainage pathways on the base or immediately outside the base that cause the flooding to occur.

On April 1, 2017, the Abilene Reporter News featured a Notice of Intent in its Public Notices section that Dyess AFB is proposing an action for facility construction, infrastructure, and demolition and renovation projects. Depending on the location of new construction and the final extent of construction (e.g., new building footprints, pavements, and other impermeable surfaces constructed), this could impact flooding in and around the base, which could result in properties off the installation experiencing flooding or runoff during heavy rain events.

Findings
- Water drainage from Dyess AFB sometimes impacts residential properties outside the base during heavy rain events. Flooding from the base may be caused by unmaintained drainage ways.
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