JOINING FORCES

Aligning Community & Military Missions

REGIONAL JOINT LAND USE STUDY

November 2017

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The views the City of Dallas has expressed in this Joint Land Use Study may not be construed to alter its legal rights, authorities, and claims, both asserted and unasserted, in the litigation pending in the United States Court of Federal Claims, "City of Dallas v. United 65nt States," Docket No. 01-284 C.

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LIST OF ABBREVIATIONS

ACUB	Army Compatible Use Buffers
AICUZ	Air Installation Compatible Use Zone
APZ	Accident Potential Zone
APZ I	Accident Potential Zone I
APZ II	Accident Potential Zone II
BASH	Bird/Animal Aircraft Strike Hazard
CFR	Code of Federal Regulations
COG	Council of Governments
CZ	Clear Zone
dB	decibel
DFW	Dallas-Fort Worth
DoD	Department of Defense
DNL	day-night average sound level
ERCOT	Electric Reliability Council of Texas
ESQD	explosive safety quantity distance
FAA	Federal Aviation Administration
FEMA	Federal Emergency Management Agency
GPS	Global Positioning System
HB	House Bill
IE	Interconnecting Entity
IR	Instrument Route
iSWM	integrated Stormwater Management
JAZ	Joint Airport Zoning
JLUS	Joint Land Use Study
JRB	Joint Reserve Base
LID	Low Impact Development
LZ	Landing Zone
mm	millimeter

LIST OF ABBREVIATIONS

MOA	Military Operating Area
MOUT	Mobile Operations and Urban Training
MSL	mean sea level
MTRs	Military Training Route
NAS	Naval Air Station
NAVAID	Navigation Aid
NCTCOG	North Central Texas Council of Governments
P4	public-public, public-private
PLMC	Planning for Livable Military Communities
RCC	Regional Coordination Council
REPI	Readiness and Environmental Protection Integration
RSAF	Royal Singapore Air Force
RTAHP	Redmond Taylor Army Heliport
SDZs	Surface Danger Zone
SH 183	State Highway 183
SH 199	State Highway 199
SR	Slow Route
SUA	Special Use Airspace
TBD	To be determined
TCC	Texas Commanders Council
TMPC	Texas Military Preparedness Commission
TXANG	Texas Air National Guard
TXARNG	Texas Army National Guard
UAS	unmanned aircraft systems
US	United States
USACE	United States Army Corps of Engineers
UXO	Unexploded Ordnance
VR	Visual Route

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EXECUTIVE SUMMARY

The *Joining Forces* Regional Joint Land Use Study (JLUS) is the culmination of a year-long collaborative effort among local, state, and regional jurisdictions; the public; federal, state, and regional agencies; and military installations within the North Texas region. The JLUS presents recommendations to promote compatible development that protects public health, safety, and welfare, and the ability of the military to accomplish its vital training and operational missions. The purpose of the study is to create and sustain dialogue around complex issues, including land use, economic development, infrastructure, environmental sustainability, and the operational demands and mission changes of military entities. The study highlights common interests, such as economic growth, more efficient infrastructure, healthier and safer environments, improved quality of life, and the protection of Department of Defense (DoD) and civilian investments.

The *Joining Forces* planning team consisted of the North Central Texas Council of Governments (NCTCOG) supported by additional technical staff. The study area consists of bases, military training facilities, and related airspace in the North Texas region and surrounding communities (see **Figure 1**). Military installations in the study are Naval Air Station Fort Worth Joint Reserve Base (NAS Fort Worth JRB); Redmond Taylor Army Heliport (RTAHP); Fort Wolters Training Center; Camp Maxey Training Center; Eagle Mountain Training Center; Brownwood and Brady Military Operating Areas (MOAs); and Colonel Stone Army Reserve Center. The area surrounding these facilities encompasses 24,200 square miles, including portions of 18 counties and more than 60 cities or census-designated communities in proximity to military operations.

The JLUS builds on prior compatibility efforts and background technical analysis in the Existing Conditions (see **Technical Appendix C**) phase to produce a tailored set of compatibility recommendations that reflect the diversity of the region and its stakeholders. This document is strictly advisory, offering a menu of tools and processes to inform future decisions and policy actions by *Joining Forces* partners. While the specific implementation actions will vary within individual communities, the overarching emphasis of the JLUS is continued coordination and communication that strengthens the relationships among study area partners and builds a lasting framework for progress toward goals. The shared vision of this study is to:

- Balance the region's strong population growth and development with protection of military operational capabilities;
- Address encroachment issues associated with emerging technologies, such as renewable energy and unmanned aircraft systems (UAS);
- Maintain the long-term viability and positive economic impact of military facilities in North Texas; and
- Carry forward specific recommendations from the 2008 JLUS for NAS Fort Worth JRB and foster additional partnerships across installations and communities throughout the region.

EXECUTIVE SUMMARY

Based on these common goals and the issues, trends, and priorities highlighted through public input and technical analysis, the JLUS identifies 152 compatibility strategies for the North Texas region and each set of installations and adjacent communities. The highest priority recommendations are:

Communication and Coordination

- Conduct educational outreach with communities to increase awareness of the security and safety risks associated with UAS operations near airfields and military facilities, and offer technical assistance to local law enforcement agencies to identify and prevent unauthorized or unsafe drone use in the community (see **Technical Appendix H**);
- Build on existing coordination bodies, such as NAS Fort Worth JRB's Regional Coordination Council (RCC) and the Texas Commanders Council (TCC) to create a region-wide forum for communication and advocacy of the military missions, installations, and training assets across North Texas;
- Incorporate stakeholder feedback to identify improvements to the RCC Development Review Web Tool to ensure continuity in use and enhance its effectiveness as a coordination and communication platform (see **Technical Appendix F**);
- Create formal, ongoing channels of communication and coordination between Fort Wolters, local jurisdictions, and Lake Mineral Wells State Park to facilitate consistent dialogue on major community actions, park plans, and military operations that have potential compatibility impacts;
- Create formal, ongoing channels of communication and coordination between Camp Maxey, local jurisdictions, and Pat Mayse Lake reservoir and Wildlife Management Area to facilitate consistent dialogue on major community actions, park use, and military operations that have potential compatibility impacts (see **Technical Appendix J**);
- Coordinate with the Texas Parks & Wildlife Department and the United States Army Corps of Engineers (USACE) to reduce the risk of trespass onto military lands at Camp Maxey;
- Leverage existing City of Dallas and City of Grand Prairie meetings and communication methods to improve military-civilian coordination at among stakeholders at RTAHP; and
- Encourage communication between RTAHP and local governments related to changes in military operations and proposed local ordinances, rules, plans or structures that could create compatibility issues, with NCTCOG assisting RTAHP to monitor local government actions.

Statewide Policy/Legislative Actions

- Actively pursue state legislation that enables local governments to implement targeted land use controls on unincorporated land in specified proximity to military installations and training areas; and
- Actively pursue other statewide legislative actions to mandate, formalize, or standardize coordination processes and regulatory tools for energy siting, UAS operations, and civilian-military consultation on proposed local ordinances, rules, plans, or structures.

Environmental/Cultural Resources

- Explore Readiness and Environmental Protection Integration (REPI) Program or other conservation-based projects within areas around the main base of NAS Fort Worth JRB or/and near off-base training areas

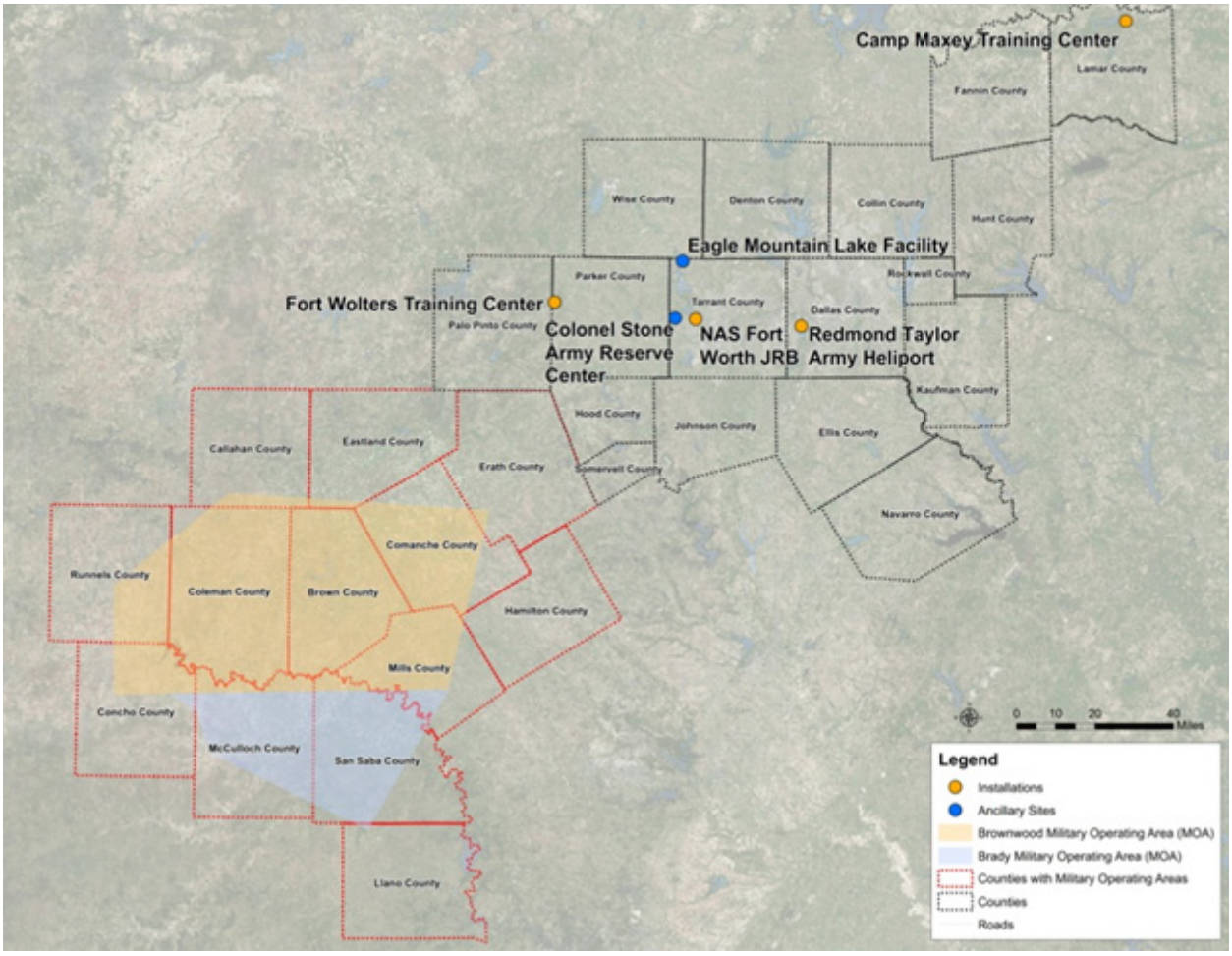
Physical Security

- Protect Camp Maxey operations and mission capabilities from threats associated with UAS and small aircraft, energy infrastructure siting, and Bird/Animal Aircraft Strike Hazard (BASH); and
- Coordinate with RCC members to reduce the risk of trespass onto NAS Fort Worth JRB from Lake Worth or other areas around the installation's perimeter.

Section 5 of the report summarizes the key implementation actions by installation and community area. **Technical Appendix B** includes implementation menus with detailed information on recommended actions.

EXECUTIVE SUMMARY

Figure 1. *Joining Forces* Regional Study Area



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1

INTRODUCTION

1 Introduction

Purpose and Background

A Joint Land Use Study (JLUS) is a collaborative process among local governments, military installations, citizens, and other stakeholders to identify and help mitigate and prevent encroachment issues that may affect current and future military missions and nearby communities. Encroachment occurs when conditions outside the military installation limit the ability of the military to perform its mission safely and effectively, or when military operations diminish quality of life in surrounding areas. This JLUS effort for the North Texas region—*Joining Forces: Aligning Community and Military Missions*—seeks to facilitate dialogue around common interests and strengthen community-military compatibility through communication, education, and the planning process.

Joining Forces builds on the momentum of ongoing regional planning initiatives and prior compatibility studies. Reflecting the size, complexity, and economic dynamism of the region, the goals of this study are to:

- Balance the region's strong population growth and development with protection of military operational capabilities;
- Address encroachment issues associated with emerging technologies, such as renewable energy and unmanned aircraft systems (UAS);
- Maintain the long-term viability and positive economic impact of military facilities in North Texas; and
- Carry forward specific recommendations from the 2008 JLUS for Naval Air Station Fort Worth Joint Reserve Base (NAS Fort Worth JRB) and foster additional partnerships across installations and communities throughout the region.

Joining Forces Study Area

The study area consists of bases, military training facilities, and related airspace in North Texas and surrounding communities (see **Table 1** and **Figure 1**). This area encompasses 24,200 square miles, including six installations, two Military Operating Areas (MOAs), numerous military training routes (MTRs) and Special Use Airspace (SUA), and portions of 18 counties and more than 60 cities or census designated communities near military operations. It also stretches across two regional planning areas. The North Central Texas Council of Governments (NCTCOG) covers 16 counties, including three counties with a major installation (Dallas, Tarrant, and Parker). The Ark-Tex Council of Governments (COG) includes Lamar County, the fourth county that hosts a major installation.

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Given the scale of the region, the JLUS process organizes the installations into functional categories based on the intensity of their activities, tenant mix, and operational missions, as shown in **Table 1**. The high-intensity installations employ large numbers of full-time active-duty, Reservists, and civilian personnel or serve as active training centers for the Texas Military Department. The high-intensity installations also manage ancillary sites for training purposes. The remaining facilities (i.e., not high-intensity) include maintenance sites, administrative centers, or training areas with lower impact operations.

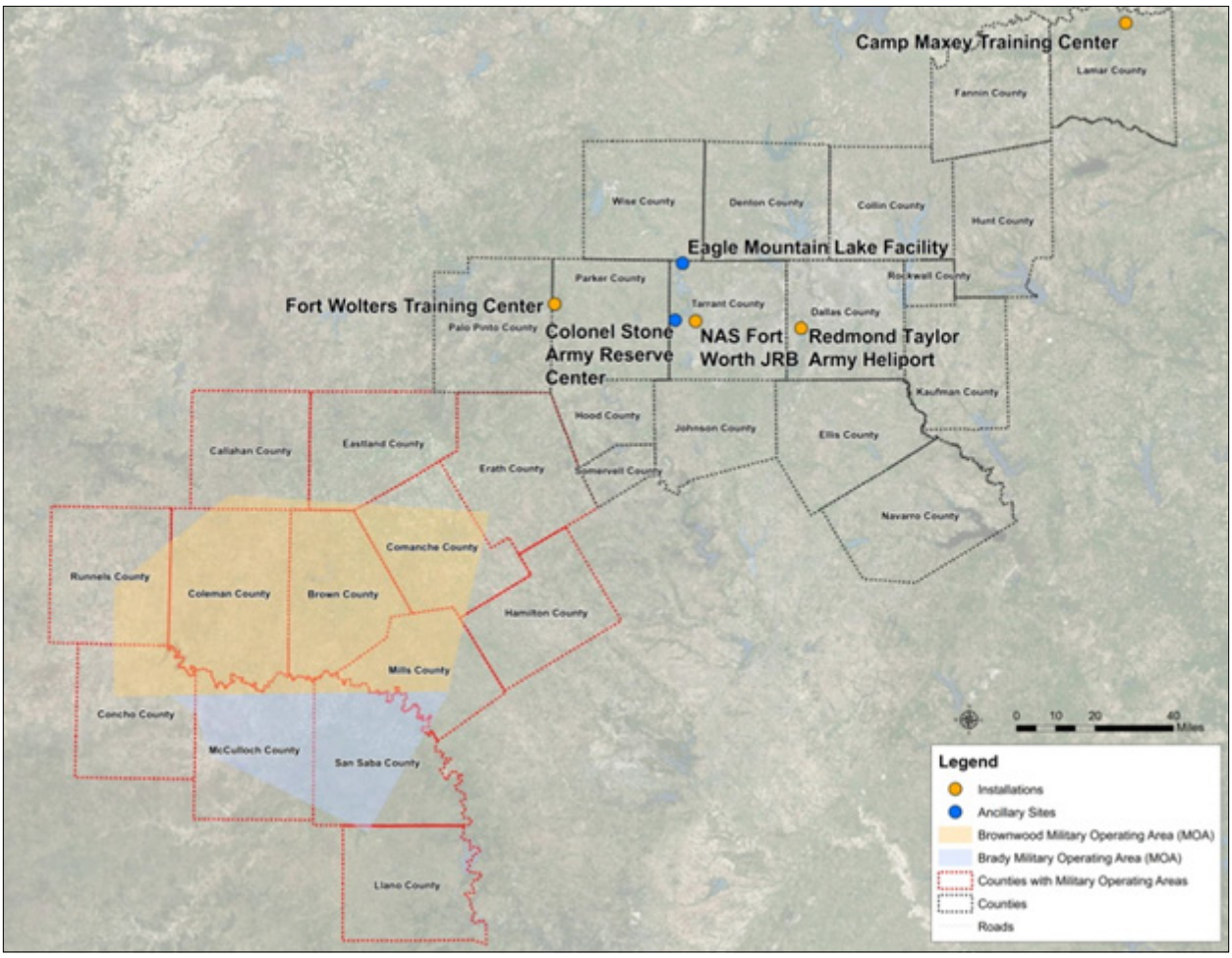
Table 1. *Joining Forces* Installations and Local Governments

LEVEL OF OPERATIONS	INSTALLATION/ MOA	COUNTY	LOCATION	LOCAL GOVERNMENTS
High-Intensity Operations	Naval Air Station Fort Worth Joint Reserve Base	Tarrant	Fort Worth, TX	Cities of Benbrook, Fort Worth, Lake Worth, River Oaks, Sansom Park, Westworth Village, and White Settlement; Tarrant County
	Redmond Taylor Army Heliport	Dallas	Dallas, TX	Cities of Dallas and Grand Prairie
	Fort Wolters Training Center	Palo-Pinto, Parker	Mineral Wells, TX	City of Mineral Wells; Palo Pinto and Parker Counties
	Camp Maxey Training Center	Lamar	Unincorporated Lamar County	City of Paris, Powderly CDP; Lamar County

Table 1. *Joining Forces* Installations and Local Governments (cont.)

LEVEL OF OPERATIONS	INSTALLATION/ MOA	COUNTY	LOCATION	LOCAL GOVERNMENTS
Ancillary Sites	Eagle Mountain Training Center	Tarrant	Pecan Acres Census Designated Place, TX	Pecan Acres Census Designated Place and Tarrant County
	Brownwood and Brady Military Operating Areas	Portions of Brown, Callahan, Coleman, Comanche, Concho, Eastland, Erath, Hamilton, Llano, McCulloch, Mills, Runnels, and San Saba Counties	Brownwood, TX	Portions of Brown, Callahan, Coleman, Comanche, Concho, Eastland, Erath, Hamilton, Llano, McCulloch, Mills, Runnels, and San Saba Counties
Low-Intensity Training/ Maintenance Sites	Colonel Stone Army Reserve Center	Tarrant	Fort Worth, TX	City of Fort Worth; Tarrant County

Figure 1. *Joining Forces* Regional Study Area



Existing Compatibility Partnerships

Regional and Local Compatibility Actions

Managing civilian-military compatibility requires collaboration across a wide array of stakeholders, coordinating the efforts of federal, state, and regional agencies, local governments, DoD entities, as well as community-based groups, non-profit organizations, and the private sector.

Regional entities and their local partners have been very active in planning for compatibility with military operations in North Texas, particularly around NAS Fort Worth JRB. The Cities of Benbrook, Fort Worth, Lake Worth, River Oaks, Westworth Village, and White Settlement, as well as Tarrant County participated in the original JLUS effort. The 2008 study recommended a series of strategies to reduce the risk of encroachment around the base and resulted in forming a Regional Coordination Committee (RCC). The RCC serves as a cooperative forum for developing, implementing, and monitoring programs and policies that enable the continued coexistence of the installation and communities. Since 2008, the RCC has implemented 17 JLUS action items, including creation of the RCC Development Review Web Tool, the Planning for Livable Military Communities (PLMC) study for local government partners, a transportation assessment, and various transportation improvements to facilitate safe and efficient vehicular access around the base.

Local governments in Tarrant and Dallas Counties have also conducted planning studies or implemented specific land use policies to promote compatibility with operational impacts as shown in **Table 2**. **Technical Appendix A** contains links to the referenced plans and codes. In 2014, the City of Benbrook adopted the "NAS" Overlay District to encourage compatible uses in areas with noise exposure of 65 decibels (dB) or higher based on the most recently adopted Air Installation Compatible Use Zone (AICUZ) for the installation. In 2013, the City of Fort Worth adopted an Airport Overlay District and Compatible Use Zone sub-districts for land falling in the Clear Zones (CZs) and north and south Accident Potential Zones (APZs) of the AICUZ. Though much of the prior compatibility effort in the region has focused on NAS Fort Worth JRB, a specific goal of *Joining Forces* is to expand collaborative partnerships and best practices to other defense communities in North Texas.

Table 2. Regional and Local Compatibility Plans and Policies

AGENCY / JURISDICTION	PLAN OR CODE
City of Benbrook	2008 JLUS Building Code PLMC NAS Overlay District
City of Fort Worth	Comprehensive Plan Building Code 2008 JLUS PLMC Naval Air Station/JRB Compatible Use Zones Airport Overlay
City of Lake Worth	2008 JLUS PLMC
City of River Oaks	2008 JLUS PLMC State Highway 199 (SH 199) Master Plan State Highway 183 (SH 183) Corridor Master Plan
City of Sansom Park	2008 JLUS PLMC
City of Westworth Village	2008 JLUS PLMC Building Regulations
City of White Settlement	2008 JLUS PLMC
NCTCOG	2008 JLUS PLMC SH 199 Corridor Master Plan SH 183 Corridor Master Plan
Tarrant County	2008 JLUS PLMC
City of Dallas	Airport Noise Contours and Airport Height Overlay Hensley Field (Redmond Taylor Army Heliport [RTAHP]) Avigation Easement Building Code and One- and Two-family Dwelling Code

State Compatibility Actions

The State of Texas has created entities and programs to protect and promote military missions through advocacy, communication, and compatibility planning. Established in 2003, the Texas Military Preparedness Commission (TMPC) seeks to protect, expand, and attract new installations, military missions, and defense-related businesses in the State of Texas. The TMPC administers two financial and technical assistance programs designed to aid defense communities: the Defense Economic Adjustment Assistance Grant Program and the Texas Military Value Revolving Loan Fund. The Department of Defense (DoD) military installations in the state formed the TCC, a consortium of the commanding officers of the military installations. The commanding officer of NAS Fort Worth JRB is a participating member of the group. As of September 1, 2013 the state officially recognized the TCC in Chapter 436 of the state code. The TCC coordinates with the TMPC on a variety of issues affecting the state's military installations, including encroachment management.

The Texas Military Department consists of the Texas Army National Guard (TXARNG), the Texas Air National Guard (TXANG), the Texas State Guard, Domestic Operations Task Force, and the Office of the Executive Director. The TXARNG staffs three of the major installations in the *Joining Forces* study area: Camp Maxey, Fort Wolters, and RTAHP.

State law determines many of the strategies available to local governments seeking to promote compatibility around installations. Zoning is a common mechanism for reducing conflicts by controlling the intensity or type of development near military operations. The State of Texas, however, does not explicitly grant counties the authority to zone unincorporated land. Since much of the rural land surrounding *Joining Forces* installations is unincorporated, this lack of zoning authority creates a significant implementation challenge for jurisdictions near Camp Maxey and Fort Wolters. The state Legislature has granted some counties in Texas the authority to enact targeted zoning powers near military installations.

Section 241.014 of the Texas Local Government Code also allows 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 state is located" to create a Joint Airport Zoning (JAZ) Board. As an entity, the board has the power to adopt, administer, and enforce compatible land use regulations within a statutorily defined area around a runway.

A special session of the Texas Legislature was held in 2017 and SB 6 (85th Texas Legislature, 1st Called Special Session) was approved. Among other issues addressed, SB 6 allows a municipality to annex property within five miles of a military base or to enforce an ordinance related to land use in the manner recommended by the most recent JLUS study. The bill, as written, limits applicability to federally-owned military facilities in counties with a population under 500,000, so it is not available for use at any of the installations in the *Joining Forces* study area. Efforts could be made during future legislative sessions to amend the law to include Texas Military Department facilities or federally-owned installations in higher populated areas.

Beyond zoning, states often play a role in facilitating notification and coordination on real estate, development, and infrastructure decisions that could affect military-civilian compatibility. Texas Local Government Code requires some local governments in the San Antonio and Wichita Falls areas to seek comments and analysis from base or facility authorities if the community determines that a proposed ordinance, rule, or plan may affect an installation or military exercises or training activities. The Texas Legislature also passed House Bill (HB) 890 during its 85th Regular Session, which provides information to the public and purchasers of real property on the impact of military installations. Effective September 1, 2017, the legislation requires counties and cities in which a military installation is located to ensure the public availability of the most recent AICUZ or JLUS. A Seller's Disclosure Notice must also acknowledge if a property may be near a military installation and subject to high noise, AICUZ, or other operations. During the 2017 session, the Texas Legislature also passed legislation related to regulation of UAS or drones by local governments and the prohibition of the operation of UAS over certain facilities or sports venues. Though HB 1424 (85th Texas Legislature, Regular Session) does not explicitly identify military installations as a protected facility type, the legislation establishes the foundation for additional policies to regulate hobbyist drone activity that could be a risk to military operations. The availability of smaller, affordable drones on the market is spurring rapid growth of commercial applications, as well as hobbyist activity. UAS can create physical hazards, such as midair strikes with aircraft, or pose security and safety threats by flying near military personnel or over sensitive operational areas.

House Bill 1643 amends the Government Code to prohibit a county, municipality, or joint airport board from adopting or enforcing a regulation regarding the operation of an unmanned aircraft except a regulation regarding the use of an unmanned aircraft during certain special events, the political subdivision's use of an unmanned aircraft, or the use of an unmanned aircraft near a facility or infrastructure owned by the political subdivision if the political subdivision holds a public hearing on the political subdivision's intent to apply for Federal Aviation Administration (FAA) authorization to adopt the regulation and receives FAA authorization. The bill expands the definition of "critical infrastructure facility" for purposes of the offense of operation of unmanned aircraft over such a facility to include any structure used as part of a system to provide wired or wireless telecommunications services, certain oil, gas, or chemical production facilities or apparatuses, and a concentrated animal feeding operation.

During the 85th legislative session, the TCC approached state delegates about a state law to restrict UAS activity over military facilities. Although the state legislature did not take such action, in April 2017, under Title 14 of the Code of Federal Regulations (14 CFR) § 99.7 – "Special Security Instructions," the FAA and DoD agreed to restrict UAS flights up to 400 feet within the lateral boundaries of certain military facilities, including NAS Fort Worth JRB. This is a significant milestone protecting installations from unauthorized UAS overflight. However, ongoing efforts are necessary to identify strategies that address UAS activity by local law enforcement beyond the lateral boundaries of a military base. **Technical Appendix H** contains Model UAS Ordinance/Guidelines to assist local governments in developing outreach and regulatory tools.

DoD Compatibility Actions

The DoD established the AICUZ program to define areas of high noise and accident potential and recommend compatible land uses. Using accident data from all military airfields, the AICUZ identifies three zones with a higher statistical risk of an aircraft accident: the CZ, Accident Potential Zone I (APZ I), and Accident Potential Zone II (APZ II). These zones extend from each end of the runway. The probability of an incident is highest in the CZ and declines with distance from the runway in APZ I and APZ II.

To depict the noise impacts of aircraft, the AICUZ expresses average decibel levels over a 24-hour period (day-night average sound level [DNL]). Generally, average noise exposure of 65 decibels or higher can cause conflicts with noise-sensitive uses, such as housing or schools. **Figure 4** shows air safety zones and noise contours around NAS Fort Worth JRB. AICUZ land use guidelines promote compatibility by discouraging people-intensive and noise-sensitive development in areas with exposure to higher safety risks or noise. It should be noted that, while the AICUZ identifies zones with a higher likelihood of impact, noise or aircraft incidents could occur in other areas.

The DoD's REPI program reduces the risk of encroachment by authorizing the Military Services (US Army, US Navy, US Marine Corps, and US Air Force) to enter into agreements with eligible entities, including local governments, non-governmental organizations, and willing land owners for real estate transactions, such as conservation easements on property near a military installation or military airspace. The agreements enable organizations to acquire, ideally on a cost-shared basis, development interests in the properties of voluntary sellers. The property owner typically continues to hold the title for the land, but receives monetary compensation and tax breaks to maintain the encumbered property in a highly limited use that preserves habitat and other sensitive environmental resources. The US Army implements REPI authority through its Army Compatible Use Buffers (ACUB) program.

In 2013, the United States (US) Departments of Agriculture, Defense, and the Interior established the Sentinel Landscapes Partnership initiative. Sentinel Landscapes seeks to preserve working or natural lands, such as farms, ranches, and forests, to achieve the complementary goals of strengthening local economies, conserving habitat and natural resources, and protecting the vital missions of nearby military installations. The region's installations have surrounding environmental features, including lakes, parks, and natural areas; The Nature Conservancy priority areas; wetlands; Federal Emergency Management Agency (FEMA) flood zones; and working lands that could form the basis of potential REPI or Sentinel Landscapes partnerships across the *Joining Forces* study area (see **Technical Appendix C, Existing Conditions Section 2.4 Regional Environmental Resources**).

2

PARTNERS AND PROCESS

2 Partners and Process

Joining Forces Process

NCTCOG received a grant from the DoD Office of Economic Adjustment to coordinate the JLUS. The resulting year-long effort, *Joining Forces*, began with a regional kick-off to identify common issues and continued through existing conditions analysis, public and stakeholder input activities, and recommendations development (see **Figure 2**). The process culminated in a regional session to endorse study findings and build momentum for plan implementation.

Figure 2. *Joining Forces* Schedule

	2016							2017						
	June	July	Aug	Sept	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	June	July
Data Collection		■	■	■	■	■	■							
NAS Fort Worth JRB Analysis								■	■	■	■			
Regional Analysis								■	■	■	■			
Committee Involvement	■				■				■			■		■
Public Involvement			■											■
Draft Plan													■	
Final Plan														■

Formal Study Partners

To balance multiple community, operational, and mission needs within a large region, NCTCOG formed four Policy Committees, representing interests around each of the high-intensity installations (see **Table 3**). The Committees provided overall guidance to the study, assisting the planning team in identifying key issues, gathering technical data, evaluating the feasibility of potential strategies, and developing final recommendations. *Joining Forces* also sought to facilitate a collaborative and inclusive process that engaged residents, businesses, landowners, community groups, and other stakeholders beyond the list of formal participants through interviews, meetings, and an online presence.

Table 3. *Joining Forces* Policy Committees

INSTALLATION	STAKEHOLDER REPRESENTATIVE
Redmond Taylor Army Heliport	City of Grand Prairie City of Dallas Redmond Taylor Army Heliport Texas Military Department – Texas Army National Guard
Fort Wolters Training Center	Palo Pinto County City of Mineral Wells Fort Wolters Mineral Wells/Palo Pinto County Area Growth Council Mineral Wells Area Chamber of Commerce Natural Resources Conservation Service Texas Military Department – Texas Army National Guard Lake Mineral Wells State Park/Texas Parks & Wildlife
Camp Maxey Training Center	Lamar County City of Paris Camp Maxey Texas Military Department – Texas Army National Guard Ark-Tex COG

Table 3. *Joining Forces* Policy Committees (cont.)

INSTALLATION	STAKEHOLDER REPRESENTATIVE
Naval Air Station Fort Worth Joint Reserve Base	City of Benbrook City of Fort Worth City of Lake Worth City of River Oaks City of Sansom Park City of Westworth Village City of White Settlement Tarrant County NAS Fort Worth JRB

Community Involvement

In addition to Policy Committee meetings, the planning team conducted face-to-face or telephone interviews with key stakeholders in the public, private, and community sectors to establish priorities for the study, gather data, and identify challenges and opportunities for further study. **Technical Appendix D** contains the full list of stakeholders. Stakeholders cited a wide variety of themes and issues, highlighting:

- Strong support for the military mission in surrounding communities and an understanding of the positive economic impact of the installations;
- Potential for increasing infill development and land use transitions in mature communities to introduce incompatibilities, especially in built out areas surrounding NAS Fort Worth JRB;
- Lack of county regulatory tools to address even modest growth in rural areas;
- Strong westward growth trajectory within the region, which could bring development closer to Fort Wolters;

- Effectiveness of existing coordination mechanisms and the successful implementation of zoning overlay tools in several communities around NAS Fort Worth JRB;
- Desire for increased military-civilian outreach and coordination in communities surrounding RTAHP, Camp Maxey, and Fort Wolters; and
- Support for additional compatibility measures, such as strategies to address energy infrastructure siting and UAS operations near airfields.

Joining Forces also offered public input opportunities through large format meetings and online content and exercises available on the project website: www.JoiningForcesNTX.org/. The planning team conducted two rounds of public meetings in Grand Prairie, River Oaks/Westworth Village, Paris, and Mineral Wells in August 2016, and July and August 2017.

The initial meetings introduced participants to the JLUS planning process and asked them to prioritize critical issues in their communities. Attendees at the Mineral Wells meeting near Fort Wolters highlighted minor compatibility issues related to development near the installation, the

Wind turbines can interfere with military aviation operations and communication systems. Photo © steve p2008, https://www.flickr.com/photos/stevepj2009/6869406438/

effect of tall structures on aviation, and the presence of cultural resources. Residents around NAS Fort Worth JRB in attendance at the River Oaks meeting noted localized stormwater/flooding issues and compatibility concerns stemming from development around the base, and circulation and traffic access. At the Camp Maxey meeting in Paris, participants highlighted issues related to transportation access around the installation, as well as nearby development. A consistent theme across all meetings was support for continued military-related growth in the surrounding communities and a desire to accommodate expanded operations at Fort Wolters and Camp Maxey.

In July and August 2017, the planning team held meetings in an Open House format, offering attendees an opportunity to review draft recommendations and comment on the JLUS document.

The planning team also conducted stakeholder interviews with city and county officials representing areas affected by military aircraft training in the southwestern portion of the study area. Officials from four of the seven counties with major land areas underlying the MOAs (Brady, Brown, Comanche, and San Saba Counties) provided feedback on community familiarity with military operations; the frequency and intensity of aircraft noise exposure; infrastructure plans, such as renewable energy; and preferred methods for communicating with residents regarding military activities.

Feedback reflected very strong levels of community support for ongoing training activities though officials indicated that residents desire more information about the military missions conducted in the area. According to stakeholders interviewed, communities experience aircraft noise, but the impacts are not intrusive or negatively affecting quality of life. While training produces periodic sonic booms, severe noise events were not recurrent and were not associated with any structural damage.

Overall, officials noted very few noise complaints from residents over an extended period of time. Stakeholders also did not identify any significant issues where aircraft-related noise startled or disturbed cattle or other livestock. Findings reinforced that while communities underlying the MOAs are welcoming and receptive to accommodating military training, additional educational outreach to residents could further strengthen understanding of military operations in the region. Officials did note either the presence of large-scale utility projects or plans to construct facilities. The Rattlesnake Wind Project will begin construction in the northwest corner of McCulloch County. The project will consist of 64 wind turbines. Logan's Gap Wind is an existing 200 megawatt facility in Comanche County that generates power from 87 wind turbines.

3

REGIONAL PROFILE

3 Regional Profile

Regional Land Use and Growth Trends

North Texas is a vast mix of urban centers and suburban-style development with smaller, lightly populated communities on the edges of the metropolitan area. The dynamic Dallas-Fort Worth (DFW) core anchors the region (see **Figure 3**). NCTCOG anticipates that the region will continue its rapid growth, with a population increase of 64 percent over the next two decades. If trends hold, the 12 counties that constitute the NCTCOG Metropolitan Planning Area (Collin, Dallas, Denton, Ellis, Hood, Hunt, Johnson, Kaufman, Parker, Rockwall, Tarrant, and Wise) will add more than 4 million people, bringing the 2040 population to approximately 11 million.

While communities in the northern and far western portions of the study area are more lightly populated than the urban core, these rural areas still face specific encroachment threats related to regional growth patterns, energy infrastructure development, and nearby natural resources. Forecasts indicate a continued expansion of development throughout the region with a pronounced westward trajectory. Particularly strong growth in Parker and Tarrant Counties will increase opportunities for more intensive redevelopment in established neighborhoods or new development that could draw increased activity near military training.

Advancing regional development, energy production, and transmission infrastructure, such as wind turbines and transmission-line towers, can pose a collision hazard to military aircraft operations, especially in designated low-altitude Military Training Routes (MTRs) or interfere with air traffic control and onboard aircraft radar systems. While wind resource potential in Texas is highest along the coast near Corpus Christi, the Panhandle region, and areas near Abilene[1], renewable energy infrastructure could begin to spread east with changing technologies and demands. The TMPC and TCC have collaborated with the Electric Reliability Council of Texas (ERCOT) and the Public Utility Commission on policy updates to require DoD notification for proposed energy generation and transmission facilities. The ERCOT *Planning Guide* contains a Declaration of Department of Defense Notification for an Interconnecting Entity (IE) (See **Technical Appendix G**). Any IE seeking a study for interconnection to the ERCOT system must submit a declaration certifying that it has notified the DoD Siting Clearinghouse of the proposed generation resource and requested an informal or formal review or demonstrate that the proposed source is not required to provide notice.

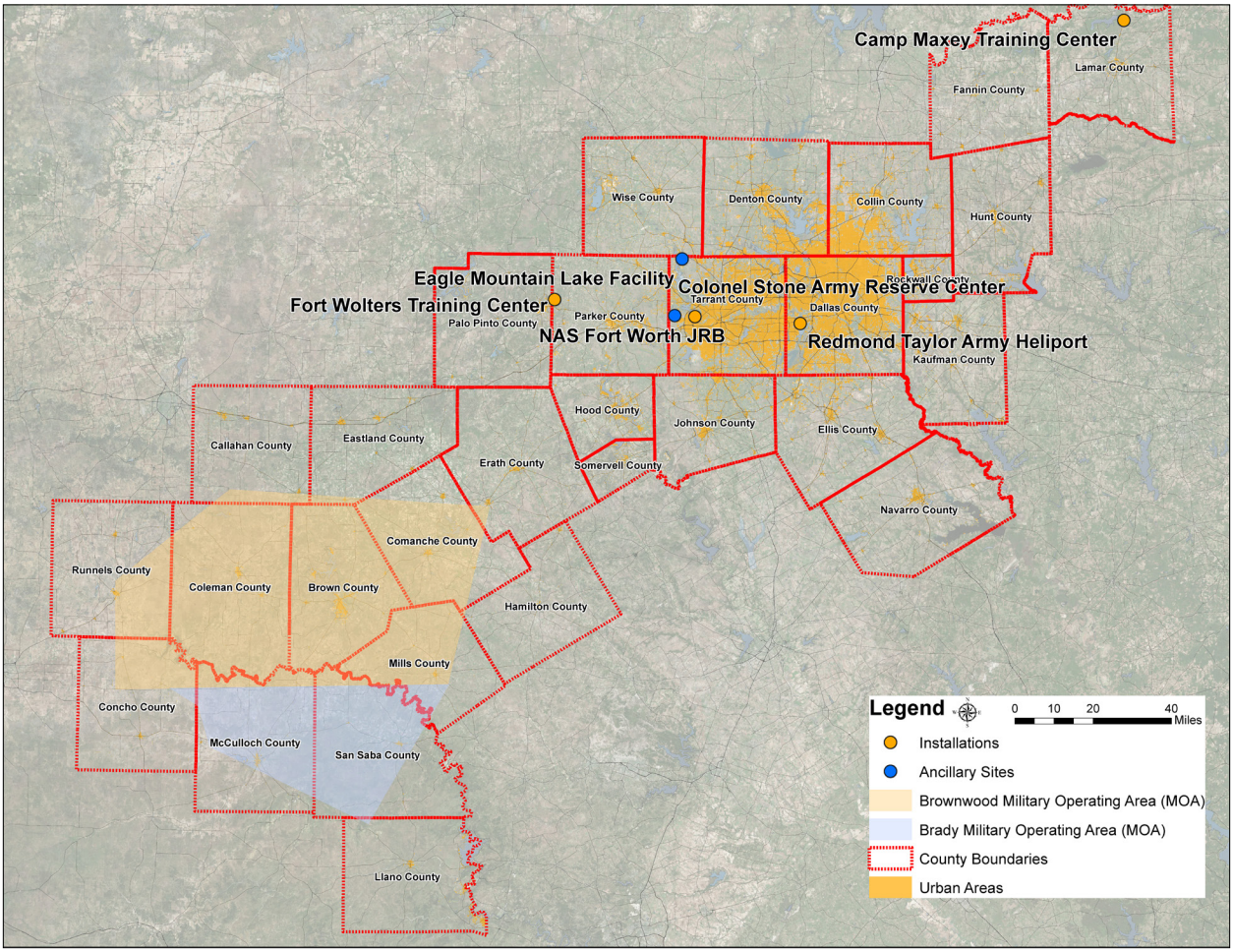
The diverse array of natural, cultural, open space, and recreational resources in North Texas forms part of the area's identity and high quality of life. These assets, however, also pose challenges

1 Texas Wind Resource Map and Potential Wind Capacity, http://apps2.eere.energy.gov/wind/windexchange/wind_resource_maps.asp?stateab=tx

and opportunities for nearby active military operations. The presence of sensitive resources, such as threatened and endangered species or cultural and archaeological sites, can require military installations to implement management and protection measures that restrict the use of land for training purposes. Nearby open space, working lands, parks, and critical habitat, however, also highlight opportunities for highly effective partnerships to preserve natural buffers around military installations, such as the DoD's REPI program.

While the *Joining Forces* region does not have significant encroachment related to threatened and endangered species, the proximity of waterbodies and public lands to the military installations may create a unique land use challenge. Nearby reservoirs and parks could cause issues related to flooding and drainage, as well as security and trespass risks for adjoining military lands. The open rangelands seen around Fort Wolters and Camp Maxey are also more prone to wildfires, particularly during drought conditions. These factors inform specific compatibility recommendations described in **Section 5**.

Figure 3. Urbanized Areas, Joining Region



USAF aircraft flies over Fort Worth, Texas
Source: Tech. Sgt. Charles Hatton, USAF - US Air Force photo 090112-F-4609H-083 from the 136th Airlift Wing website

Regional Economic Profile

The DFW region is one of the most diverse and dynamic economies in the nation. Significant industry clusters include aviation/aerospace, finance, healthcare, high technology, logistics, and manufacturing. Military-related facilities are also major contributors to the region's solid economic base. Installations provide direct jobs to enlisted personnel, contractors, civilians, and support staff. Additionally, personnel boost local economies by spending wages on goods and services produced in their communities. Along with active personnel, veterans compose a substantial percentage of the population, making up 6.5 percent of civilians age 18 or older in the 12-county DFW region and 9.8 percent of civilians age 18 or older in Lamar County, home of Camp Maxey.

Regionally, NAS Fort Worth JRB generates an estimated $6.6 billion in goods and services and $2.7 billion in post-income-tax personal income. The installation supports jobs for 17,466 people, and provides direct and indirect employment to 47,256 workers. The presence of the base and nearby Lockheed Martin has elevated the region to a top aviation and aerospace hub. From 2004 through 2014, employment in Tarrant County attributed to the military increased by six percent. Although no comparable economic data is available for Texas Army National Guard facilities, Camp Maxey and Fort Wolters both saw a substantial increase in use of training facilities between 2012 and 2014.

JOINING FORCES

The Texas military footprint is among the largest in the US. According to the latest analysis from the Texas Comptroller, the state's 15 major DoD installations generate $136 billion in economic activity, support more than 800,000 jobs, and create $48 billion in personal income annually. The impact of Texas military installations ranked ahead of agriculture and just behind energy as the state's biggest economic drivers.

F-35B and F-35C aircraft fly together over Fort Worth, Texas
Source: Lockheed Martin

NAS Fort Worth Joint Reserve Base Profile

NAS Fort Worth JRB's mission is "to provide joint training capabilities to enable War Fighter readiness while sustaining personnel and families' needs, future compatibility and inculcating a culture of safety." The primary responsibility of NAS Fort Worth JRB is to ensure combat readiness by training and equipping aircrews and aviation ground-support personnel. The base hosts over 45 separate tenant commands that represent the US Navy, US Marine Corps, US Army, US Air Force, and TXANG. Approximately 9,900 personnel operate at the 2,300-acre base, including active-duty military personnel, Guardsmen, Reservists, and civilians. These personnel conduct an average of

2,000 air operations each month. Operations take place between 7 a.m. and 11 p.m. **Table 4** shows the squadrons and aircraft at the base. Pilots from NAS Fort Worth JRB use airspace in the Brady and Brownwood MOAs, which are about 70 miles southwest of the base by air travel. The base also hosts a number of transient aircraft. Approximately 210,000 retirees in the region also access the base for a variety of services.

Figure 4 shows the installation and the surrounding communities. The US Air Force has identified NAS Fort Worth JRB as a candidate site for basing of the F-35 aircraft. The US Air Force will make a basing decision in 2017.

The Lockheed Martin facility adjacent to NAS Fort Worth JRB shares the installation runway for manufacturing and testing activities. Lockheed Martin has transitioned to a high rate of Joint Strike Fighter aircraft production at its facility. After $1 billion in investments, the plant will produce one aircraft per day or approximately 17 per month. Along with production, Lockheed Martin conducts flight testing, which can generate noise impacts on surrounding areas, particularly during aircraft hovering. Lockheed Martin faces encroachment challenges similar to NAS Fort Worth JRB, including concerns related to wind turbines, lighting, and UAS operations.

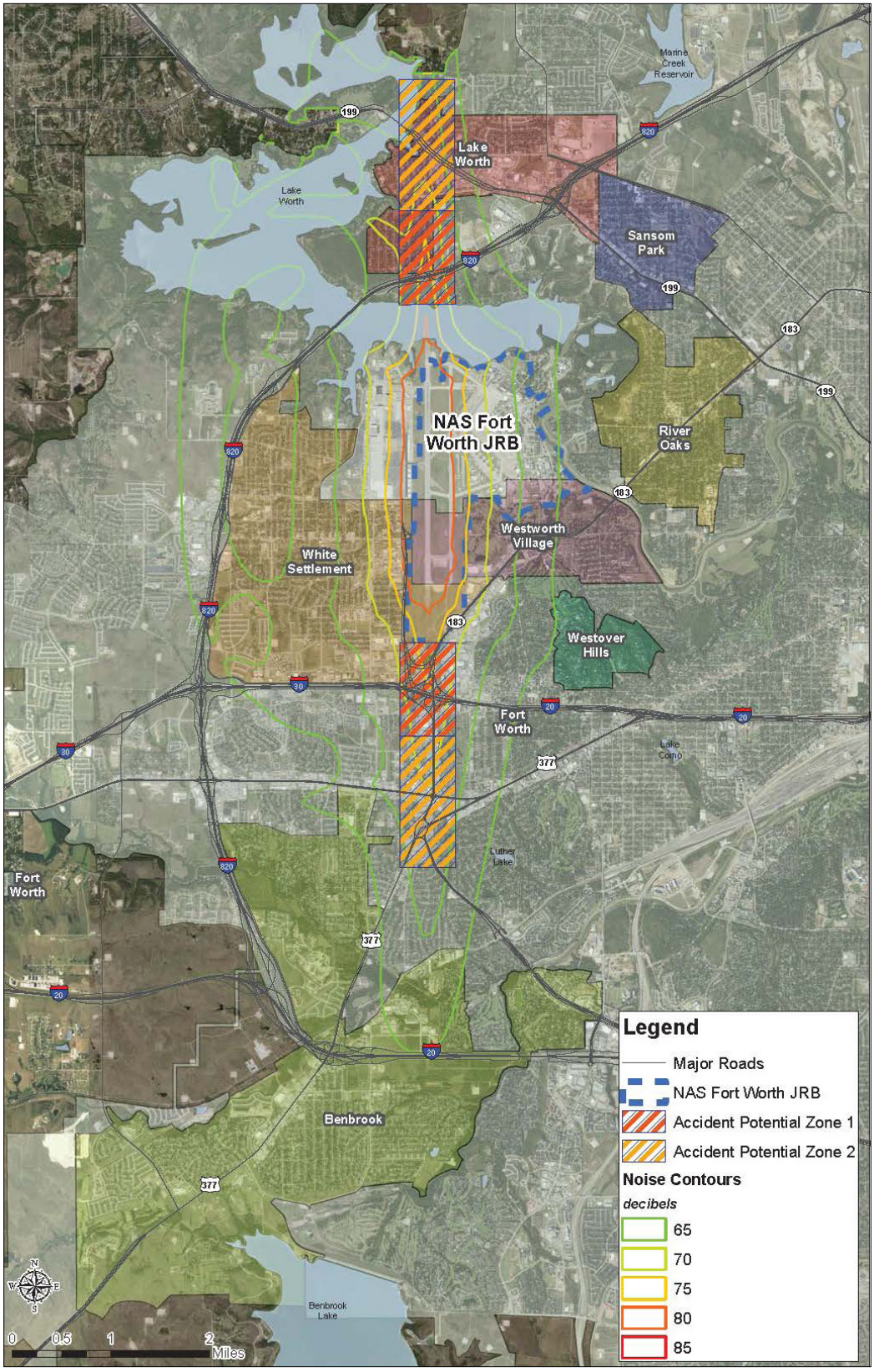
Table 4. NAS Fort Worth JRB Squadrons and Aircraft

FIXED WING	TYPE	QUANTITY
VR	C40	3
VMR	C40	TBD*
VMFA	F-18	4
VMGR	KC-130J	5**
US Army	C12/UC-35	3/1
US Air Force	F-16	24
TXANG	C-130	8

1. * Marines Reserve VMR-1 personnel transition underway. Aircraft arrival date to be determined (TBD).
2. ** Possible Transition to 10-15

Source: Community Planning and Liaison Officer Mike Branum, NAS Fort Worth JRB

Figure 4. NAS Fort Worth JRB and Surrounding Communities



Camp Maxey Training Center Profile

Camp Maxey Gate Source: Handbook of Texas Online, www.tshaonline.org/handbook; Camp Maxey

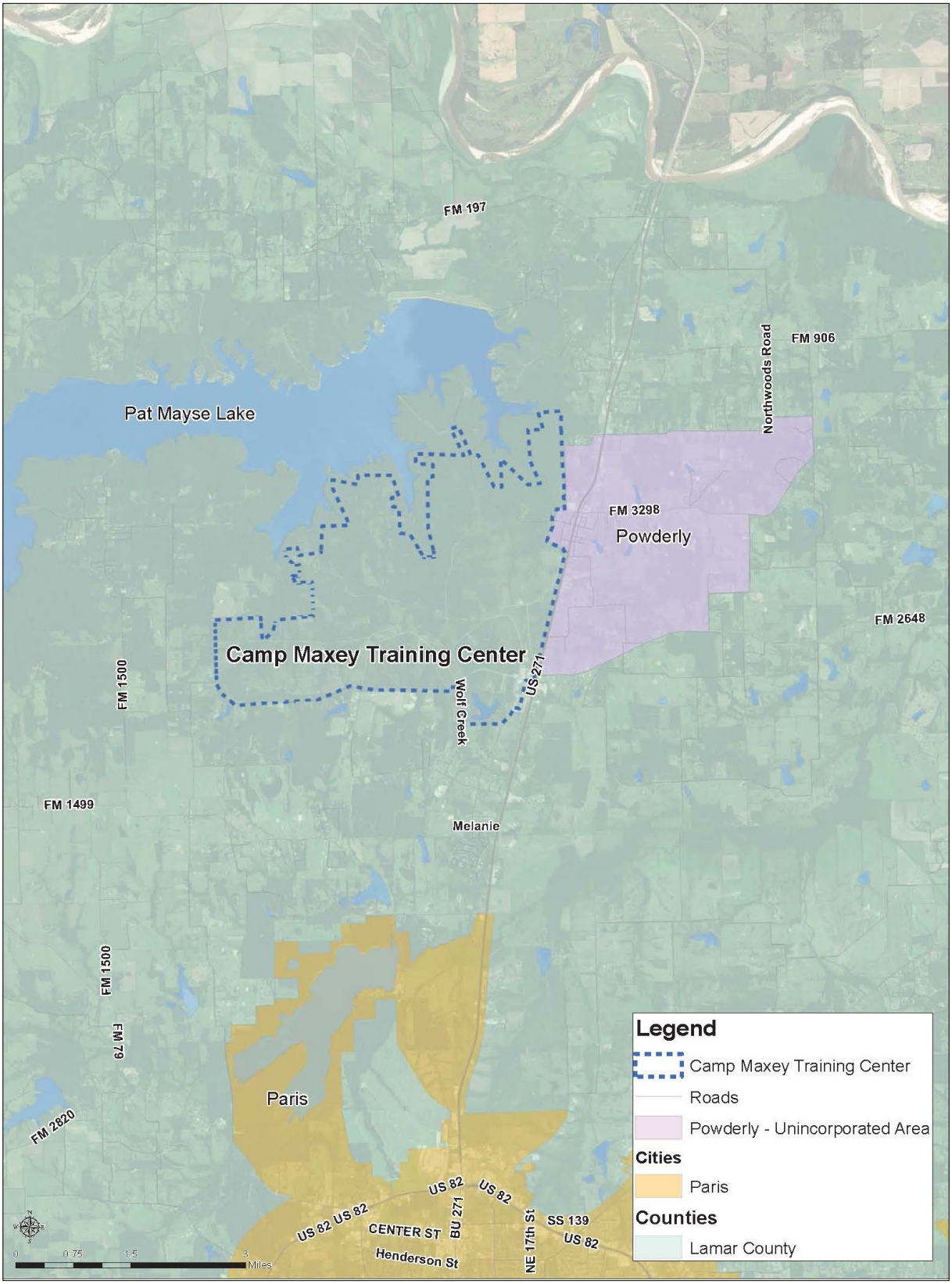
The TXARNG staffs Camp Maxey with 18 full-time personnel on site. Camp Maxey provides combat readiness training for up to battalion-sized elements for TXARNG units in the northeastern part of the state, including:

- Military police training;
- Light Infantry Training;
- Small Unit Tactics and Engineer training;
- Several firing ranges, including 9 millimeter (mm) pistol range, 5.56 mm Pop Up Range, 5.56 mm Zero Range, 7.62 or 5.56 mm fixed machine gun range, and 40 mm Grenade range;
- Land Navigation Course;
- Confidence Course;
- Nuclear Biological Chemical chamber;
- Mobility, counter mobility, survivability and construction operations;
- Mobile Operations and Urban Training (MOUT) site;
- A Unit Training Equipment Site where the motor pool is maintained;
- A buried Ammunition Supply Point; and
- Storage for 8,000 gallons of fuel.

Trainees who visit Camp Maxey include units from the TXARNG, US Army Reserve, US Navy, US Army, and US Marine Corps Reserve, as well as personnel outside of the DoD. The 2nd detachment of Garrison Training Center Command is the main user. Usage tends to be highest on drill weekends from March through October with typically at least one unit participating every weekend. Camp Maxey has experienced a 67 percent increase in use since 2012, with 32,516 personnel training at the site in 2014.

TXARNG Chinooks from RTAHP fly into Camp Maxey once or twice a year; Black Hawks also occasionally use the site. There is an informal Landing Zone (LZ) in the cantonment (developed) area near US 271. **Figure 5** shows the installation and surrounding land uses.

Figure 5. Camp Maxey and Surrounding Communities



Redmond Taylor Army Heliport Profile

RTAHP is on the west side of the former Hensley Field (NAS Dallas). The heliport is an approximately 110-acre lease, housing the Dallas Army Aviation Support Facility #3, the 2-149th Aviation Readiness Center, and the Field Maintenance Shop #16. Approximately 200 Soldiers and Singapore Air Force personnel staff the site on a daily basis. Another 250 military personnel train during drill weekends.

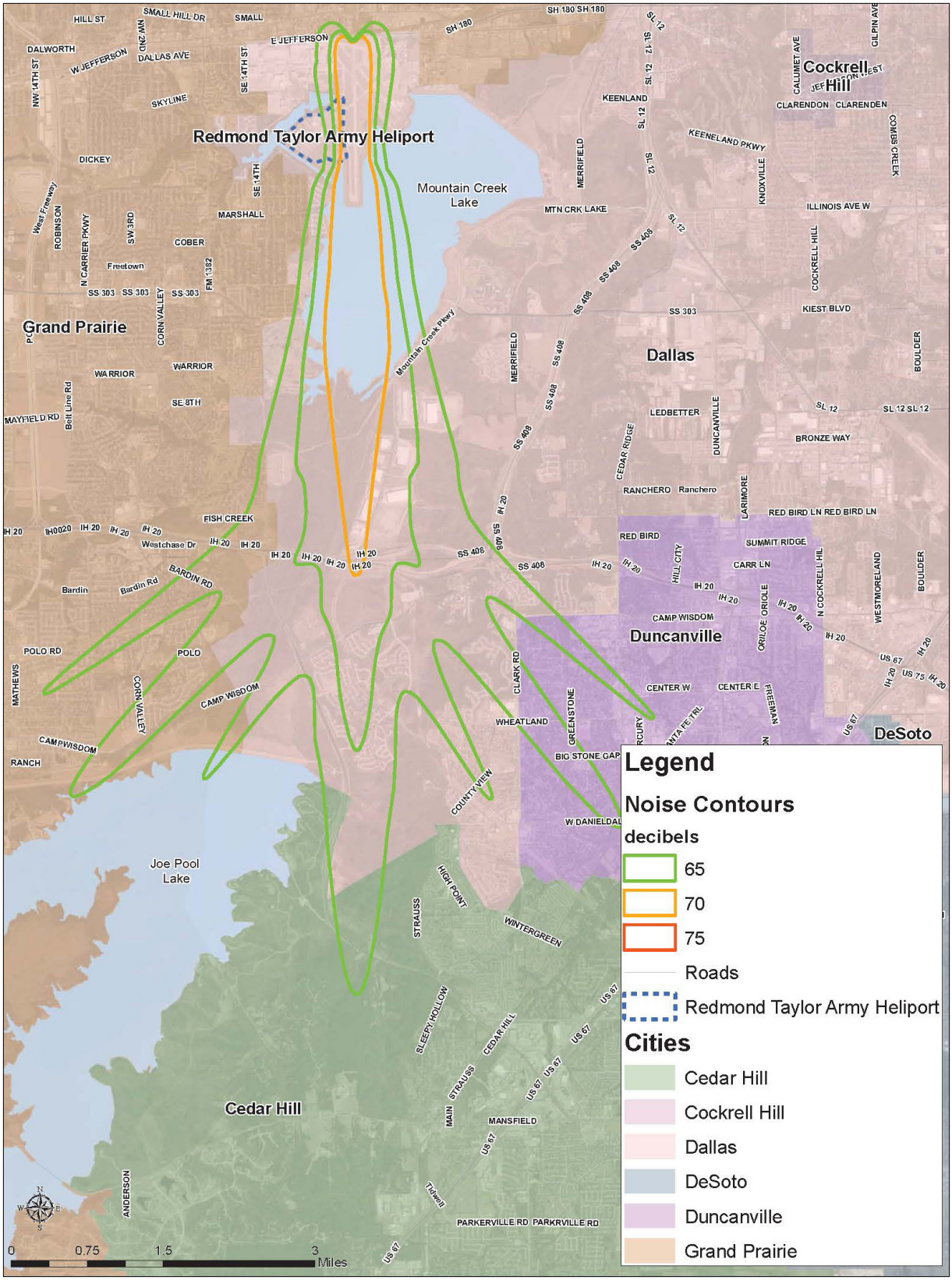
Redmond Taylor Army Heliport
Source: AECOM

The TXARNG operates eight CH-47 Chinooks on site for cargo and troop transport training. The helicopters fly to Kenneth Copeland Airfield in Tarrant County, Fort Wolters in Mineral Wells, and Camp Bowie in Brownwood. The Royal Singapore Air Force (RSAF) conducts training with six Chinooks on the site under a separate lease. Combined, the TXARNG and RSAF units fly approximately eight hours per day, typically Monday through Friday but with occasional weekend flights. Frequent nighttime operations occur Monday through Thursday. In addition to their wartime mission, RTAHP personnel fight wildfires with the Texas Forestry Service and assist local and state authorities during natural disasters, such as hurricanes and floods.

The Grand Prairie Armed Forces Complex is on the east side of the field, serving as an administrative center for several US Armed Forces branches. Facilities include a headquarters building and a large vehicle maintenance area. The TXARNG also houses its 176th Engineer Brigade at the complex. The east side of the installation does not host any aviation assets.

Aviation units at RTAHP log about 1,100 to 1,200 flight hours per year. Activity may increase slightly in the near future, and the site could add up to six UH-60 aircraft, depending on the training needs of the Texas Military Department. **Figure 6** shows the installation and the surrounding communities, along with contours depicting the noise impacts of operating aircraft.

Figure 6. RTAHP and Surrounding Communities



Fort Wolters Training Center Profile

The Maneuver Training Center – Light at Fort Wolters provides pre-mobilization and sustainment training for all northern TXARNG units west of Interstate 35. This training includes:

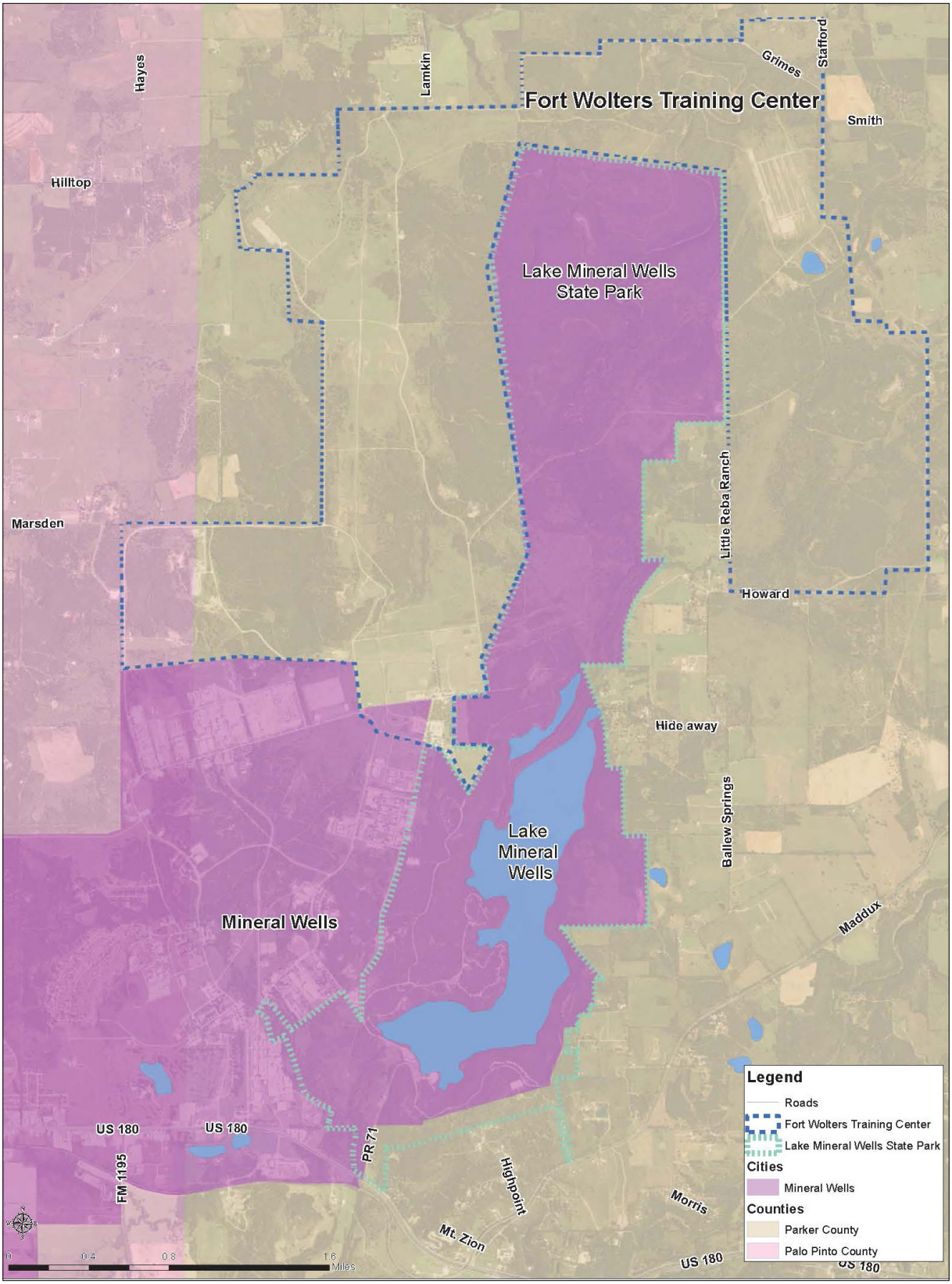
- 24-kilometer Improvised Explosive Device defeat route along the facility perimeter;
- MOUT sites;
- Simulations, including small arms training and known-distance ranges;
- Hand grenade qualification;
- Nuclear Biological Chemical chamber;
- Forward Operating Base simulation;
- Acreage for bivouacking (temporary camping) and maneuver training;
- A Unit Training Equipment Site where the motor pool is maintained (can also serve as a maintenance facility to support habitual users);
- A State Shop for maintenance; and
- Storage for 14,000 gallons of fuel.

Fort Wolters Training Center
Source: AECOM

The installation supports Special Forces, Airborne, and Joint Training operations, including airdrops and air landings from the 136th TXANG unit out of NAS Fort Worth JRB. Operations involve heavy drops, light drops, and personnel drops. Fort Wolters is the closest training site for units from NAS Fort Worth JRB.

Fort Wolters has a staff of 25 full-time personnel, but an increasing volume of military personnel visit the facility each year. Drill weekends from March through May see the highest levels of activity. In 2014, 48,745 total visitors came to Fort Wolters (47,309 military personnel; 1,436 non-DoD personnel), representing a 68 percent increase over 2012 activity. **Figure 7** shows the installation and surrounding communities.

Figure 7. Fort Wolters and Surrounding Communities



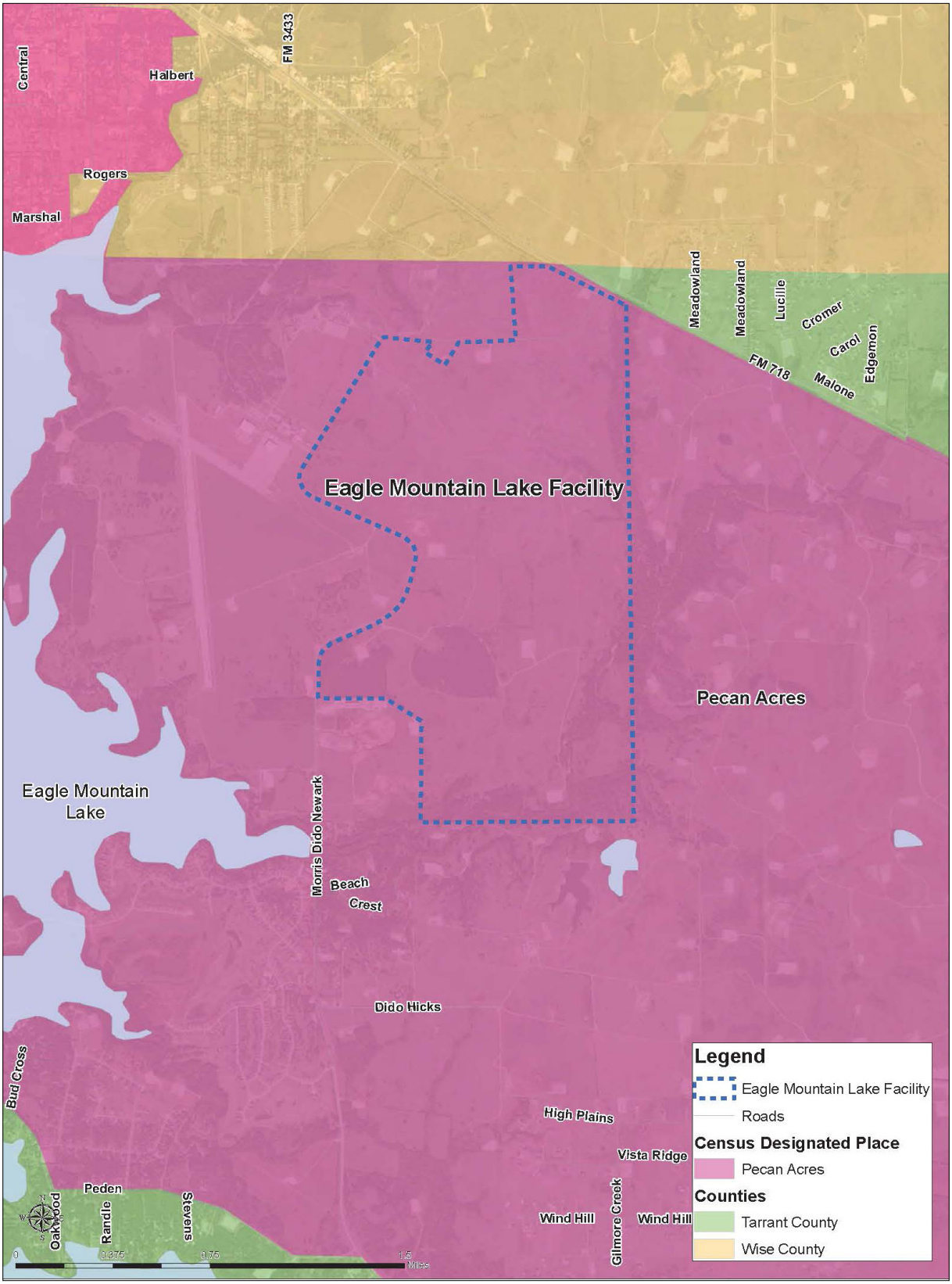
Ancillary Sites

In addition to the four high-intensity installations profiled above, the *Joining Forces* study area includes the following ancillary sites that provide training assets in support of higher intensity facilities, as well as maintenance sites, administrative centers, or training areas with lower impact operations.

Eagle Mountain Lake Facility

Fort Wolters manages the Eagle Mountain Lake Facility, which is east of the Kenneth Copeland Airfield in Tarrant County (see **Figure 8**). The largely rural Pecan Acres community surrounds most of the facility. Personnel use the 1,212-acre site approximately six times per year for field training and bivouacking (temporary camping). Units also conduct regular helicopter confined space landings and angled maneuvers.

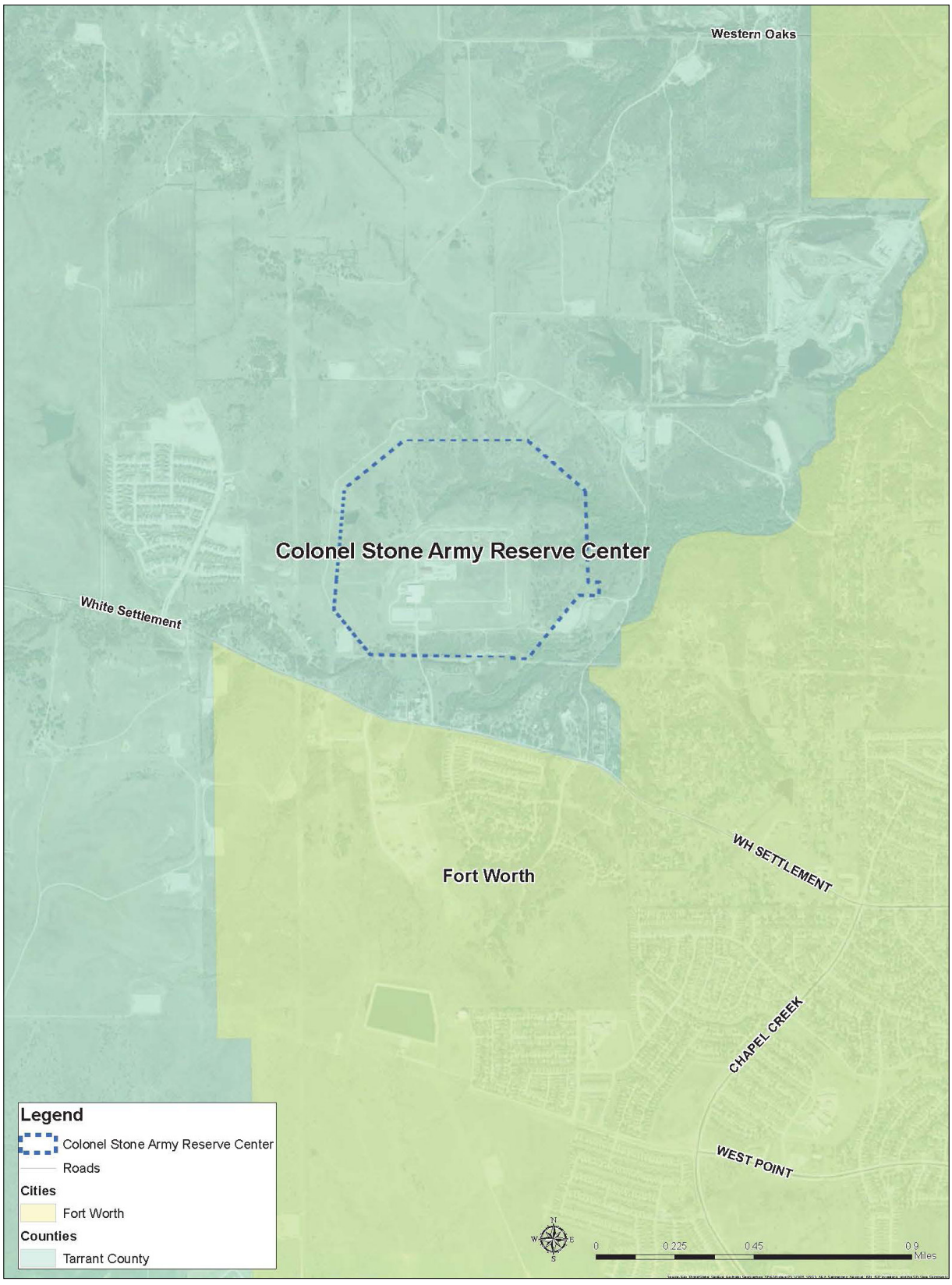
Figure 8. Eagle Mountain Lake Facility and Surrounding Communities



Colonel Stone Army Reserve Center

The Colonel Stone Army Reserve Center (also known as Fort Worth Army Reserve Center) is off White Settlement Road in the western portion of Tarrant County. The 240-acre site supports the 370th Chemical Company, 320th Quartermaster Detachment, and the 90th Aviation Support Battalion. This facility is primarily an administrative center but also accommodates convoy, land, field, and helicopter training. Approximately 500 to 1,000 Reservists come to the facility once a month to drill. In addition, the facility includes an Organization Maintenance Shop building, administrative areas, vault, weapons simulator, and physical fitness area. The site falls in unincorporated Tarrant County but is very close to the City of Fort Worth (see **Figure 9**).

Figure 9. Colonel Stone Army Reserve Center and Surrounding Communities



Brownwood and Brady Military Operating Areas

Due to mission requirements and safety issues, military aircraft participating in training activities must separate from non-military aircraft. SUA designates the boundaries of military operations and restricts access to the area by non-military aircraft during active operations. MOAs are a type of SUA. NAS Fort Worth JRB tenant units conduct training activities in the Brownwood and Brady MOAs, approximately 70 miles southwest of the base (see **Figure 10**). The MOAs also establish maximum and minimum altitudes for aircraft operations. This training airspace is operational from sunrise to 11 p.m., Monday through Friday, or as posted by FAA-issued Notices to Airmen.

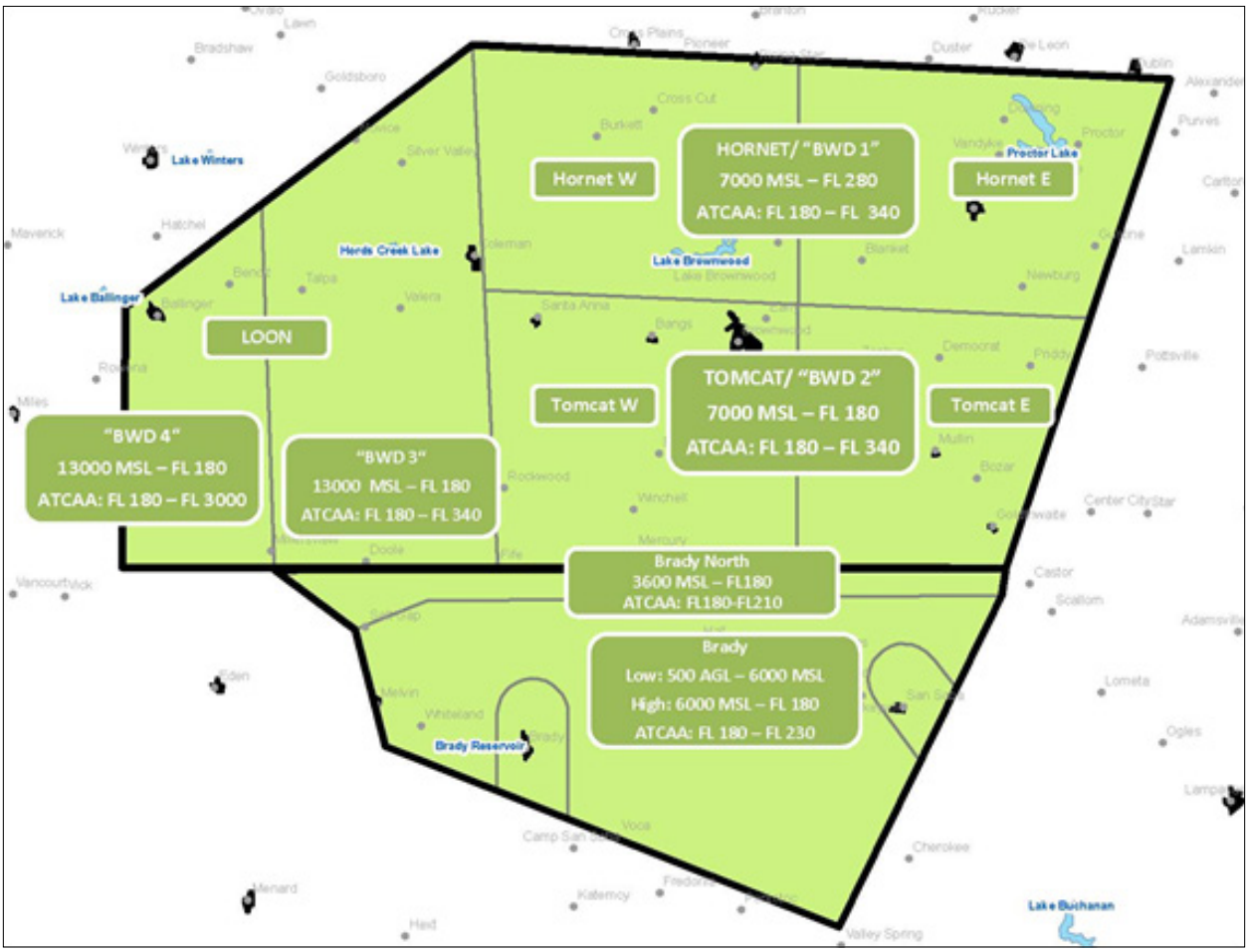
The US Air Force owns the Brownwood MOA, which encompasses approximately 3,200 square miles of training airspace. Altitudes range throughout the area from a low of 7,000 feet above mean sea level (MSL) to a high of 18,000 feet MSL when in use. The US Air Force also owns the Brady MOA directly south of the Brownwood MOA. This area offers approximately 1,500 square miles of training airspace. The Brady MOA altitudes range from 500 feet above ground level to 18,000 feet MSL. The US Air Force's 301st Fighter Wing schedules use of the Brownwood and Brady MOAs.

The MOAs cover the far southwestern part of the study area, overlying portions of Brown, Callahan, Coleman, Comanche, Concho, Eastland, Erath, Hamilton, Llano, McCulloch, Mills, Runnels, and San Saba Counties.

Aircraft participating in training exercises use MTRs to access airspace. These routes designate air corridors for low-altitude, high-speed military flight traffic and training. The US Air Force's 301st Fighter Wing schedules use of MTRs to access local training areas. Commonly used MTRs are Instrument Routes (IRs) 103, 105, 123, 124, and 139; Visual Routes (VRs) 101, 104, 118, 143, 186, 1110, 1124, 1128, and 1137; and Slow Routes (SRs) 228 and 270 (see **Figure 11**).

Personnel at NAS Fort Worth JRB have noted an increase in activity in the MOAs with the number of annual operations rising from approximately 3,500 in 2009 to 6,000 in 2012. Factors related to use or the scheduling of airspace, however, have not adversely affected the training environment.

Figure 10. Brownwood and Brady MOAs



Source: Community Planning and Liaison Officer Mike Branum, NAS Fort Worth JRB

Figure 11. Local Military Training Routes

4

COMPATIBILITY FACTORS

4 Compatibility Factors

The central purpose of the JLUS is to reduce or, when feasible, eliminate compatibility issues between the military and surrounding civilian land uses. Compatibility challenges occur when:

- Certain types of development limit the ability of the military to perform its missions or cause changes in training or testing operations that reduce mission effectiveness; and/or
- Communities experience higher than normal levels of impacts from military activities, such as noise or safety risks, which can then affect quality of life or uses of land.

The planning process began by identifying 14 potential compatibility factors in the North Texas region. **Table 5** describes these factors and indicates if the installation and nearby communities experience related encroachment issues. As the analysis highlights, compatibility challenges are specific to each installation's individual context, varying due to surrounding land use, military operations, and the intensity of use. Other factors, such as airspace, air quality, energy, and flooding have regional implications due to their complexity and multi-jurisdictional scale.

The remainder of **Section 4** elaborates on the compatibility concerns for each installation or training area. The analysis of these factors forms the basis of the strategies found in the compatibility menus described in **Section 5**.

Table 5. Compatibility Factors

COMPATIBILITY FACTOR	NAS FORT WORTH	FORT WOLTERS	FORT MAXEY	RTAHP	EAGLE MOUNTAIN	STONE ARMY RES.	MOAs
Air quality refers to air pollution and any limitations on operational activities that could result from non-compliance with air quality standards.	●			●			
Airspace refers to conditions that either constrain the capacity of airspace or create safety hazards. Conflicts may result from air traffic congestion, mid-air strike hazards from birds, UAS or small aircraft, or vertical intrusions.	●	●	●	●	●	●	●
Cultural resources include historic districts, sites, structures, included, or eligible for inclusion, in the National Register of Historic Places. Resources on or off the installation can restrict use of training lands.		●					
Development reflects the growth of nearby communities, resulting in additional housing and infrastructure, higher population densities, and the conversion of agricultural, grazing, or forest lands.	●			●	●	●	

Table 5. Compatibility Factors (cont.)

COMPATIBILITY FACTOR	NAS FORT WORTH	FORT WOLTERS	FORT MAXEY	RTAHP	EAGLE MOUNTAIN	STONE ARMY RES.	MOAs
Energy includes compatibility conflicts from the development, siting, distribution, or transmission of energy resources. Structures, such as wind turbines, transmission lines, or gas wells can interfere with air traffic control and onboard aircraft radar systems or create aviation hazards.	●	●	●	●	●	●	●
Flooding refers to poor drainage that disrupts military operations (e.g. standing water on airfield) or creates flooding impacts in nearby communities.							
Frequency spectrum refers to competition or interference that restricts the military's access to bandwidth or that blocks or impedes its ability to transmit or receive data (e.g. Navigation Aid [NAVAID] Systems and radar). Military operations can also interfere with the civilian use of frequency spectrum (e.g. Global Positioning System [GPS] jamming).	●						
Light pollution/glare refers to stray or excessive light from lighting systems or signs that can interfere with pilot vision or the use of night-vision training devices during military training operations.	●						

Table 5. Compatibility Factors (cont.)

COMPATIBILITY FACTOR	NAS FORT WORTH	FORT WOLTERS	FORT MAXEY	RTAHP	EAGLE MOUNTAIN	STONE ARMY RES.	MOAs
Munitions involve safety and environmental concerns that are a consequence of mission activities. Examples are Unexploded Ordnance (UXO) or the presence of people or development near the safety fans of weapons firing areas or explosive hazards (munitions storage).	●	●	●				
Noise is any sound produced by military readiness activities (e.g., aircraft operations, small and large caliber weapons firing) that affects nearby communities.	●			●			●
Security encroachment occurs from actions that might compromise the safety of either training military personnel or civilians. An example is the unauthorized access (either intentional or unintentional) of members of the public onto military lands or weaknesses in perimeter security or access control points.	●		●	●			

Table 5. Compatibility Factors (cont.)

COMPATIBILITY FACTOR	NAS FORT WORTH	FORT WOLTERS	FORT MAXEY	RTAHP	EAGLE MOUNTAIN	STONE ARMY RES.	MOAs
Species and habitat refer to threatened and endangered species, critical habitat, or areas of environmental sensitivity either on the installation or in adjacent communities. Mandated protection of species and/or habitat can result in restrictions on the use of military lands for training purposes.							
Transportation impacts include military vehicle use of local roadways and localized traffic impacts in surrounding communities resulting from delayed ingress and egress at installation gates.	●		●			●	
Water encroachment results from either water quality (e.g. pollution) or supply (i.e., quantity and availability) issues.				●			
Wildfire encompasses the increased risk of wildfire due to weapons firing or ordnance use. Installations may also be at risk of wildfire that spreads from the surrounding community.		●	●				

NAS Fort Worth JRB Compatibility

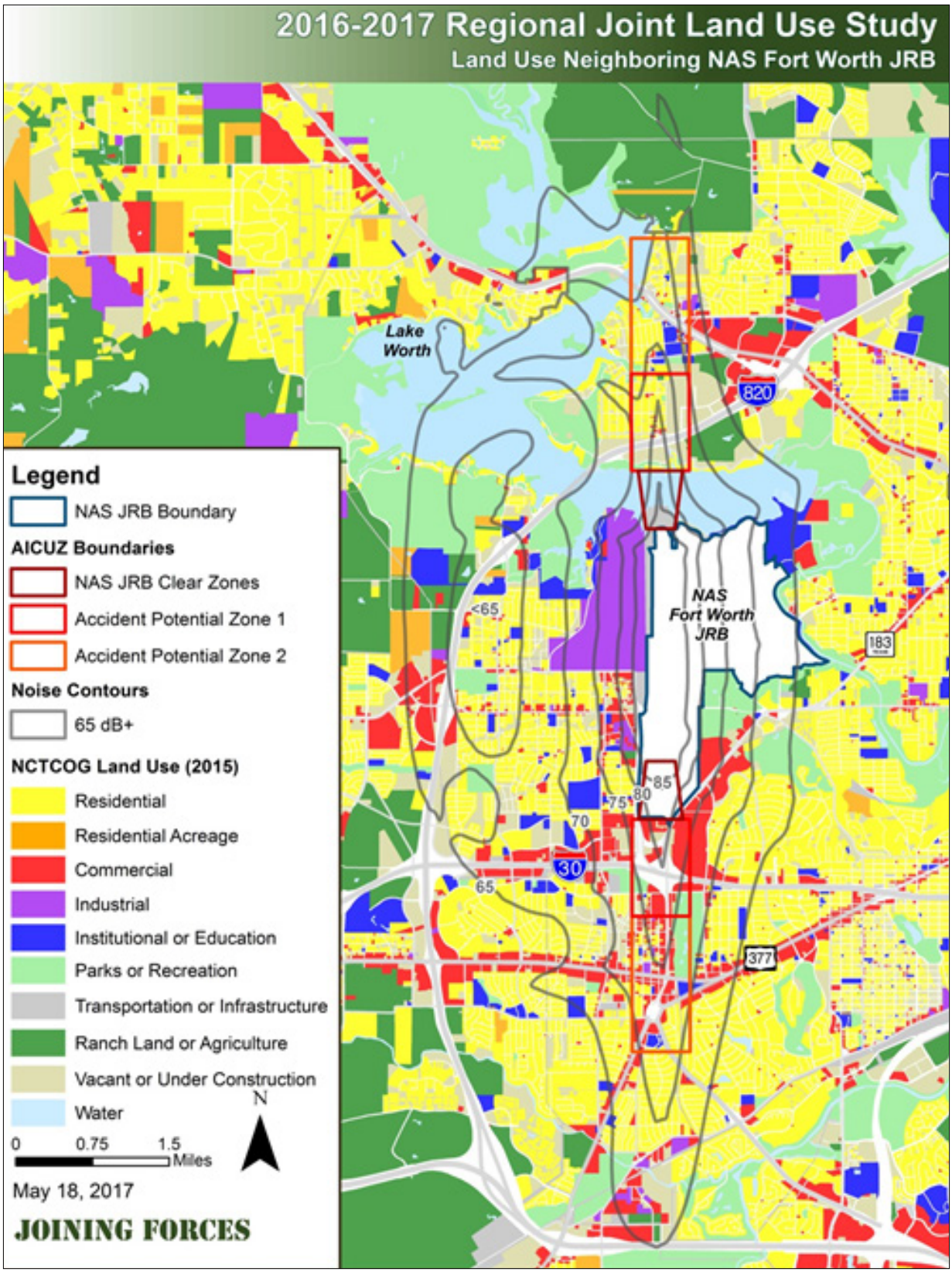
NAS Fort Worth JRB Compatibility Issues

NAS Fort Worth JRB affects and interacts with several cities in Tarrant County: Fort Worth, Benbrook, Lake Worth, River Oaks, Sansom Park, Westover Hills, Westworth Village, and White Settlement (see **Figure 4**). **Figure 12** shows the heavily residential character of areas surrounding the base, as well as concentrations of retail use to the south. The base's compatibility issues are:

- Airspace
- Development
- Energy
- Flooding/drainage
- Frequency spectrum
- Light pollution
- Airborne Noise
- Security
- Transportation
- UXO/Munitions

The NAS Fort Worth JRB AICUZ identifies air safety zones (CZ, APZ I, and APZ II) that extend to the north off the base. To the south, APZ I and APZ II cross the installation boundary into the community. The extended centerline of the assault landing strip on base also extends to the south over a commercial redevelopment opportunity (Ridgmar Mall) in the City of Fort Worth.

Figure 12. NAS Forth Worth JRB Surrounding Land Use, 2015

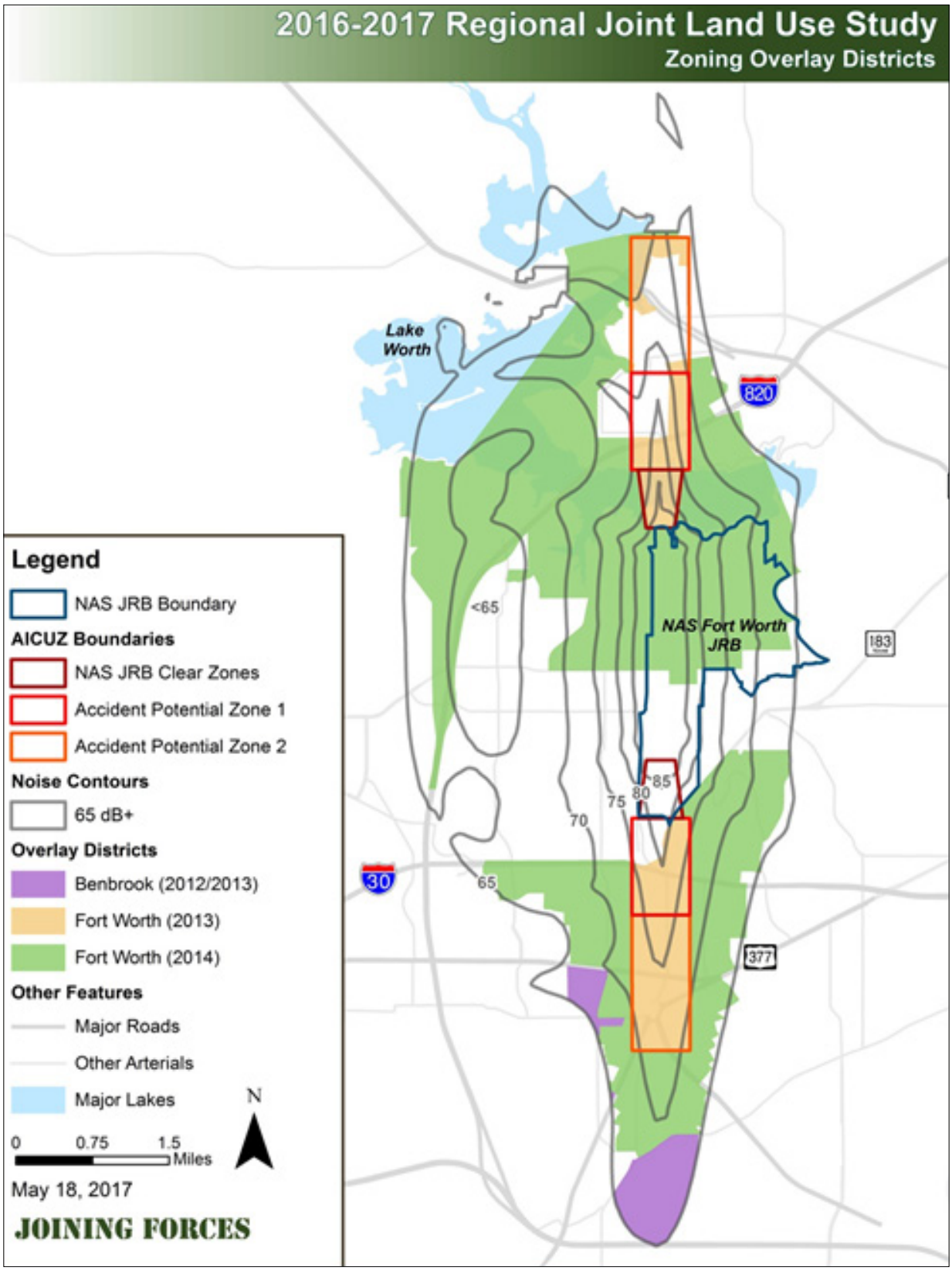


High average levels of aircraft noise extend north and south from the runway with lower noise exposure spreading farther into the community. The cities of Benbrook and Fort Worth have adopted overlays to address air safety and noise impacts (see **Section 2** and **Figure 13**). On the air safety side, portions of the APZs within Lake Worth to the north and White Settlement to the south do not have regulatory overlays in place to control development intensity or land use type in areas of higher accident risk.

In general, community and stakeholder feedback indicates that aircraft noise around NAS Fort Worth JRB does not significantly affect quality of life. In the previous 12 months, the base received 10 noise-related complaints, 8 of which did not originate from NAS Fort Worth JRB aircraft operations. Base aircraft, however, may generate noise impacts, including supersonic booms, when conducting training activity in outlying airspace, affecting communities in the far southwestern portion of the study area. Lockheed Martin also conducts flight testing at and around the base, which can generate noise impacts on surrounding areas, particularly during aircraft hovering.

The most significant compatibility concerns for NAS Fort Worth JRB revolve around new development pressures and flight obstructions. Even though current residents are relatively accustomed to existing noise, increasing infill development and redevelopment activity in surrounding communities could place more people in proximity to aircraft noise. Similarly, residential turnover in nearby mature neighborhoods could attract new residents without ties to the base or familiarity with the area's long military history.

Figure 13. NAS Forth Worth JRB Zoning Overlay Districts, 2017



NCTCOG conducted an analysis of land use compatibility in the AICUZ surrounding the base. Using DoD compatibility guidelines, the analysis seeks to determine if community land use change from 2005 to 2015 has produced more or less compatibility with noise and safety impacts. In all of the noise contours, the changes showed a mix of decreasing and increasing compatibility. The majority of land use changes in both the north and south APZ II resulted in an increase in compatibility, except for some changes that took place along the shore of Lake Worth. The land use changes in both APZ I areas showed a mix of decreasing and increasing in compatibility. No land use changes occurred in the CZs (see **Technical Appendix E** for the full Land Use Compatibility Memorandum).

Along with development, mission change could affect overall compatibility by altering the noise environment. NAS Fort Worth JRB is a candidate site for basing of the F-35. Though noise varies based on operational characteristics, the F-35 aircraft is in general louder than the current F-16. In addition, the engines of this 5th generation fighter operate at another frequency that could produce differing perceptions of nuisance in the community.

The only explosive safety quantity distance (ESQD) arcs that extend beyond the installation's property boundaries are those associated with the northern munitions storage facilities. These ESQD arcs extend approximately 1,000 feet out into Lake Worth, which is open to the public for recreational purposes, although a buoy line was recently refreshed in the area to prevent public access. This buoy line is enforced with the cooperation of the City of Fort Worth Police Lake Worth Marshal. NAS Fort Worth JRB has site approval from the DoD Explosive Safety Board for the ESQD arc, and the boundary of the arc is marked with buoys.

Other compatibility impacts relate to energy and transportation. Energy-related infrastructure, including utility-scale wind and solar, transmission lines, and gas wells can pose a collision threat and interfere with radar and navigational aids near the base and in MTRs to the southwest. The base has also had sightings of UAS in the area, which can create a flight hazard for low-flying aircraft and a security risk for military personnel. Special events at NAS Fort Worth JRB or other periods of high demand such as drill weekends can delay access at the gate and cause vehicular congestion on the local road network. NCTCOG, as the Metropolitan Planning Organization responsible for transportation planning in the region, has undertaken numerous projects to enhance access to NAS Fort Worth JRB and improve area roadway function.

Stormwater Management

NAS Fort Worth JRB is bounded by Lake Worth on the north, the West Fork of the Trinity River to the east, and the Farmers Branch Creek Watershed, which flows through two large culverts under the southern runways of the airfield. Thunderstorms bring significant rainfall to the region, producing localized flooding. The City of White Settlement, in particular, is prone to flooding given the high

percentage of impervious surface in the area. NAS Fort Worth JRB previously experienced flooding on runways during rainfall events. Flooding on airfield runways can be highly disruptive to training and can jeopardize the safety of personnel and damage aircraft.

To address ongoing flooding and drainage issues, the *Joining Forces* study included a review of prior flooding studies and additional hydrologic and hydraulic analysis of the installation, surrounding communities, and the Farmers Branch Creek Watershed (see **Technical Appendix K** for the full Stormwater Memo). The USACE completed an update to the original FEMA Hydrology and Hydraulics for the Farmers Branch Watershed in November of 2005. The report concluded that the Farmers Branch Creek experienced costly, repetitive flooding even during minor storm events and identified several options to reduce impacts, including replacement of bridge and culvert structures along the floodplain, detention ponds near Interstate Highway 820, and widening of the existing channels. Previous NCTCOG corridor master plan efforts, specifically SH 183 (River Oaks Boulevard) and SH 199 (Jacksboro Highway) have also assessed flooding issues in areas surrounding NAS Fort Worth JRB. Inadequate drainage collection, minimal storm drain inlets, insufficient upstream and on-system capture areas, and wide swaths of impervious cover contribute to poor drainage along the corridors and subsequent flooding. NAS Fort Worth JRB confirms there are currently no significant, or recurring, flooding concerns within its fence line.

While the base and surrounding areas have made progress in addressing flooding, a regional emphasis on stormwater management is necessary to maintain manageable rates of stormwater flow as development in the watershed continues and ensure the effective function of current stormwater infrastructure. Substantial increases in future stormwater flow and any degrading of the capacity of the stormwater system could generate new flooding risks at the base or affect access and safety due to flooding in surrounding areas. **Section 5** and **Technical Appendix L** explore planning-, infrastructure-, and maintenance-related strategies.

NAS Fort Worth JRB Communication and Coordination

Communication and coordination refers to the existing processes and tools that an installation and surrounding communities can use to increase understanding of military missions and activities, identify potential encroachment issues, and promote compatibility through inter-jurisdictional and inter-agency cooperation on critical planning issues. The collaborative framework supporting NAS Fort Worth JRB is the strongest in the North Texas region due to long-standing compatibility efforts that date back to the 2008 JLUS and the 2013 PLMC. As noted earlier, study partners, along with the NCTCOG, formed the RCC to serve as a joint forum for ongoing military and community planning. NCTCOG also hosts the RCC Development Review Web Tool, a web-based clearinghouse to track and review community projects and initiatives. In this collaborative context, the base has maintained an active presence in local planning initiatives, and community stakeholders have expressed strong support for base personnel and operations.

Given the mature partnership between NAS Fort Worth JRB and nearby local jurisdictions, the emphasis of the *Joining Forces* study in this area is on refining and enhancing available tools, such as the RCC Development Review Web Tool as described in **Section 5**.

MOA Compatibility

Training airspace in the Brady and Brownwood MOAs is prone to noise-, flight obstruction-, and energy infrastructure-related compatibility challenges. Participating aircraft can generate noise that affects nearby communities, particularly during low altitude exercises or supersonic flight operations. The Brady and Brownwood MOAs allow for supersonic flight, which produces a distinctive percussive boom as the aircraft travels in excess of the speed of sound. These outlying rural areas are also likelier to be the site of large-scale energy infrastructure. Aircraft can be vulnerable to physical intrusions, such as tall structures in low-level corridors or radar interference from wind turbines. These issues suggest opportunities for additional community outreach and consultation processes to coordinate on energy infrastructure development.

Fort Wolters Compatibility

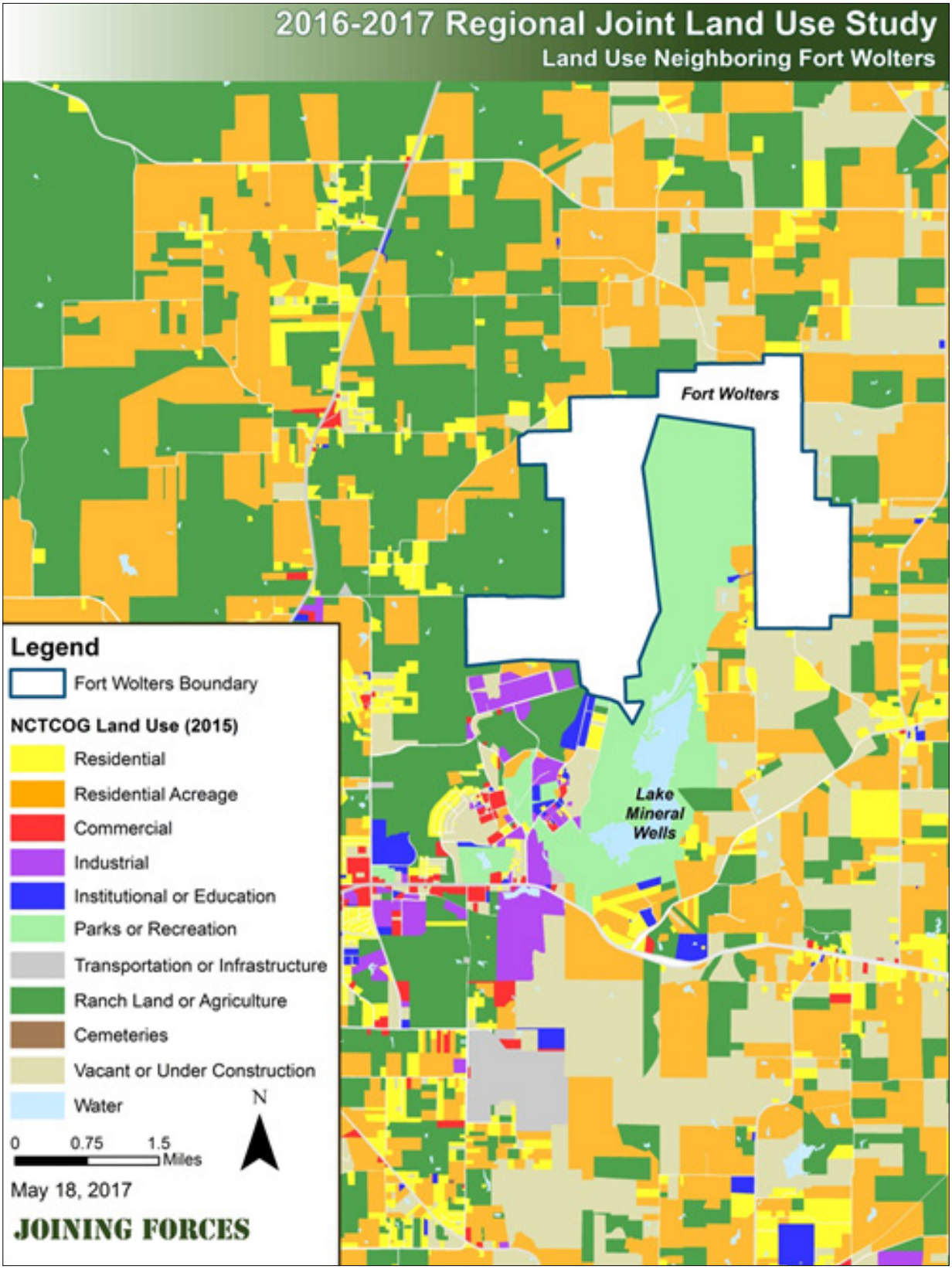
Fort Wolters Compatibility Issues

The almost 4,000-acre installation largely surrounds Lake Mineral Wells State Park and Trailway (see **Figure 7**). **Figure 14** shows surrounding land use. The installation's compatibility issues are:

- Airspace
- Cultural Resources
- Energy
- Munitions
- Wildfire

While the area is mostly rural, a small amount of residential development to the north requires aircraft flying to Fort Wolters along a north-south route to navigate between two houses. Housing to the west also brings residents close to the boundary of Surface Danger Zones (SDZs), which are the computer-modeled footprint for an impact area related to ammunition fired from the Fort Wolters firing ranges. These homes are within the east-west drop zone area. Future development north or west of the installation could affect C-130 drop zone run-ins. Wind energy development is also a growing compatibility concern for the area. Several wind turbines exist near the drop zone run-ins, and developers have announced additional wind farms. Stakeholders also cited the presence of scattered UXO in the area.

Figure 14. Fort Wolters Surrounding Land Use, 2015



Though the installation is next to a large park, trespassing has not been a major issue to date. However, this proximity raises the risk of illegal entry onto military lands by hunters or other recreational users and places emphasis on opportunities for coordination with the Texas Parks & Wildlife Department.

The area is rich in natural and cultural resources. Fort Wolters is home to 52 documented archaeological sites, including historic military sites, late 19th- to early 20th-century homesteads, and Native American burial grounds and camp sites. The area has plentiful deer hunting opportunities. Stakeholders have noted the increasing presence of an invasive and potentially destructive feral pig population. The installation is interested in exploring an ACUB initiative to identify priorities for establishing conservation-related buffers.

Fort Wolters Communication and Coordination

Fort Wolters enjoys a strong collaborative relationship with the City of Mineral Wells. For example, recent consultation between the military and the City on a communications tower proposal to the west of the installation resulted in denial of the request due to concerns over aviation safety. There are no current formal, standing channels of communication and coordination between the installation and surrounding communities though stakeholders have met once informally and have expressed interest in meeting more regularly. Interaction with the Counties of Palo Pinto and Parker is absent. The community of Mineral Wells is highly supportive of the nearby military mission and has emphasized interest in accommodating increased operations at the installation. Both military and civilian stakeholders have stated a desire for additional outreach and coordination to facilitate growth of the military mission and compatibility.

Camp Maxey Compatibility

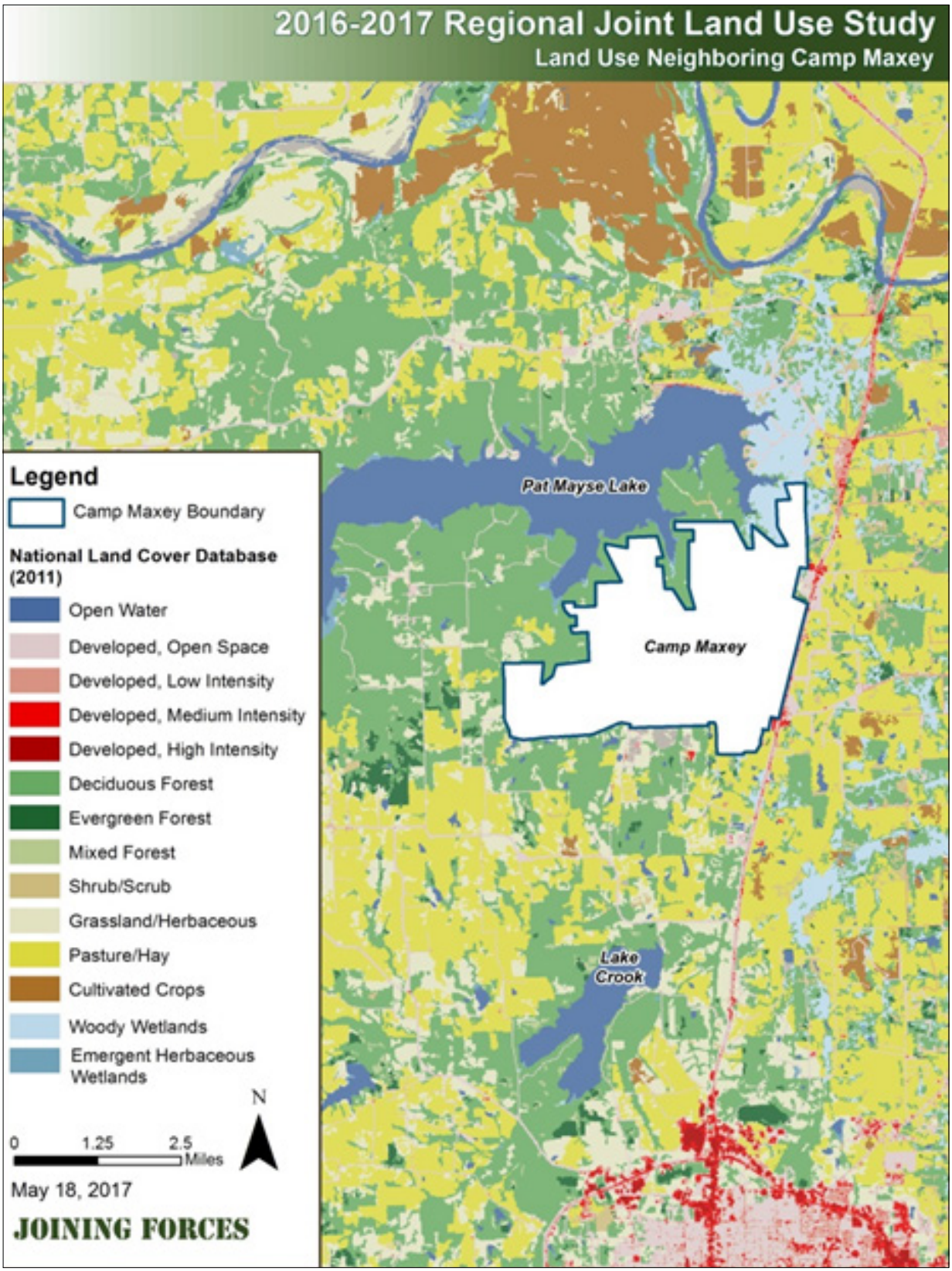
Camp Maxey Compatibility Issues

The 6,650-acre Camp Maxey is less than 10 miles north of the City of Paris, neighboring the unincorporated community of Powderly (see Figure 5). Figure 15 shows land use surrounding the installation. The installation's compatibility issues are:

- Airspace
- Energy
- Munitions
- Security
- Transportation
- Wildfire

Currently, there is minimal residential development surrounding the installation with a very low-density subdivision, Beaver Creek, close to the boundary, and manufactured houses in Powderly near range operations. Personnel are not aware of noise or other complaints from residents. Any northward shift of interest in residential development, however, would place new houses closer to Camp Maxey.

Figure 15. Camp Maxey Surrounding Land Use, 2015



The primary land use incompatibility facing Camp Maxey results from adjacency with Pat Mayse Lake. The installation boundary does not extend to the shores of the lake, preventing Camp Maxey from effectively securing its northern perimeter. Hunters entering from adjacent recreational lands regularly trespass onto Camp Maxey, posing a safety risk for themselves, as well as for soldiers in the training areas. Stakeholders have noted that hunting stands placed on USACE property are sometimes oriented toward the installation, creating an inward firing hazard.

Camp Maxey faces operational constraints due to size. The acreage at the installation is not sufficient to accommodate necessary training, requiring units to travel to other facilities around the state. Part of the SDZ, which predicts the area in which a projectile will land by direct fire or ricochet, falls partially outside of the installation boundary. The installation has an agreement with the USACE to lease the affected land outside of the boundary. The range fan is 5 meters too short to accommodate 50 caliber weapons training. Base stakeholders have noted that small aircraft, non-military periodically fly low over the eastern portion of the installation during range operations, halting firing activity due to safety risks for both the pilot and on-the-ground military personnel.

Camp Maxey faces several transportation-related issues both on and off the installation. The City of Paris holds an easement for use of an on-base road; however, entities other than the city often use the on-base road, creating potential conflicts with training activities. On the surrounding local roadways, increasing commercial and installation traffic, including military convoys, create safety risks and congestion at the main gate. The lack of signs and wayfinding contributes to a lack of visibility for the installation, which can make access more challenging for visiting units and increase safety issues.

As with Fort Wolters, range operations could increase the risk of wildfire spreading outward onto nearby lands. In previous years, the absence of firebreaks has enabled fires from surrounding community lands to cross onto the installation property.

Camp Maxey Communication and Coordination

Camp Maxey has held open house events in the past but has not conducted community outreach activities recently. The installation maintains a strong relationship with the USACE Southwestern Division, Fort Worth District. There are no formal, standing channels of communication and coordination between the installation and surrounding communities. The City of Paris, however, is highly supportive of the military mission and has expressed interest in accommodating increased activity at the base. The Ark-Tex COG, which includes Lamar County, has also recently joined the JLUS effort as new compatibility partner.

RTAHP Compatibility

RTAHP Compatibility Issues

RTAHP is directly adjacent to residential areas in the Cities of Dallas and Grand Prairie (see **Figure 6**). **Figure 16** shows surrounding land uses. The installation's compatibility issues are:

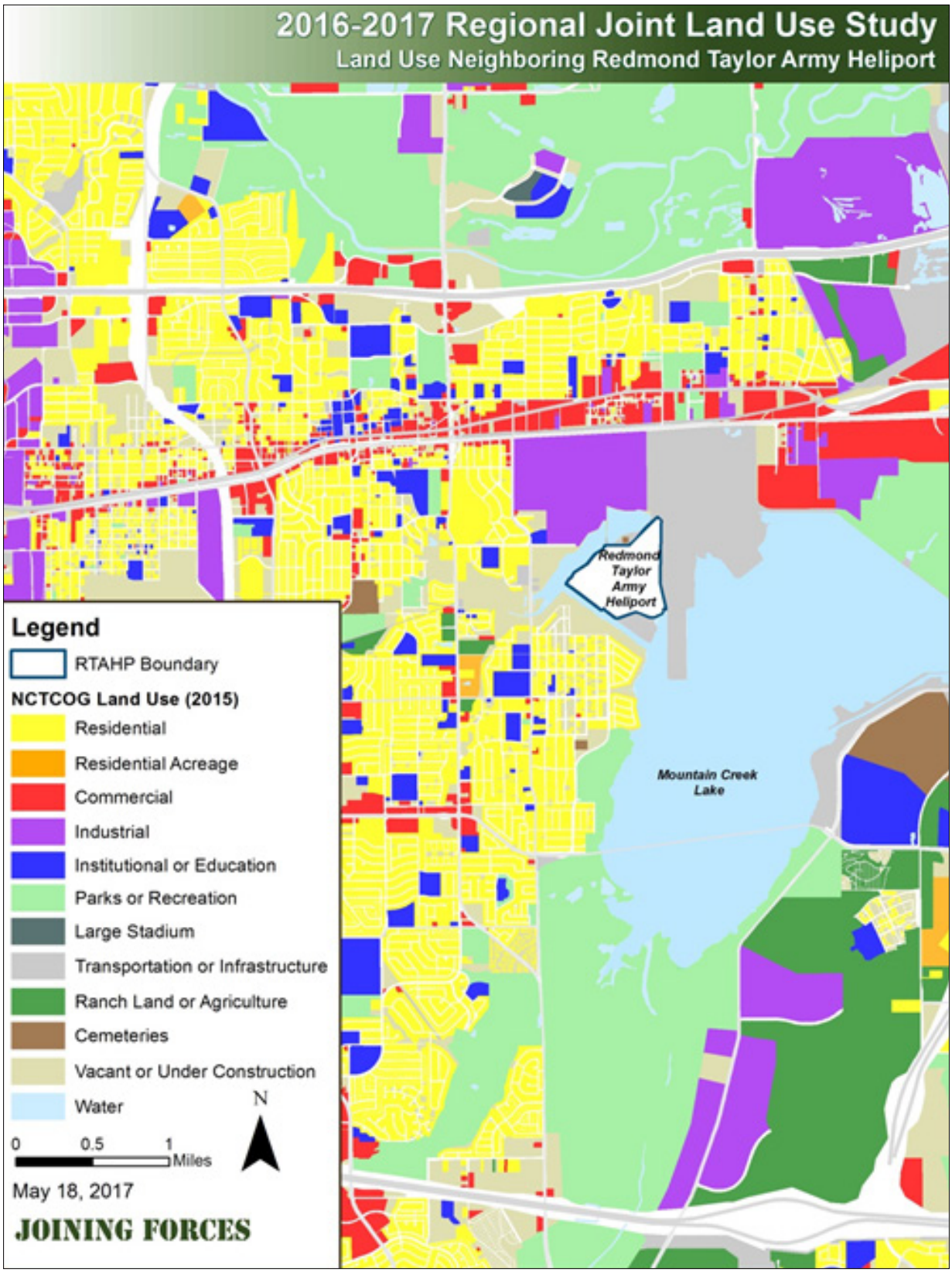
- Airspace
- Energy
- Noise
- Security
- Transportation

Close-in residential neighborhoods pose both noise- and security-related issues and constrict available training space at RTAHP. City officials have cited some noise complaints related to helicopter operations from residents in the Redbird community of Dallas. Most noise complaints are around airfields when units practice approaches.

To reduce noise exposure in the community, the aviation units use half of the local traffic pattern, avoiding incompatible areas, including development southwest of the base. Two significant recent routing adjustments in the remaining airspace further limit opportunities for realistic training and complex air maneuvers. Recent proposals could result in more land use conflicts due to increased noise sensitivity. Development pressure in the area includes proposed housing at the former Triumph Aerostructures site just to the north; commercial/potential mixed-use development south of Mountain Creek Lake; the continued growth of residential areas to the north, west, and south of the airfield; and the potential for the redevelopment of current warehouse uses to the east and south.

The direct adjacency of housing to the installation and the use of private security at the entry have raised ongoing security concerns. Though trespass is less significant than at Camp Maxey, community stakeholders have noted at least isolated examples of unauthorized access with people cutting fencing to gain illegal access to the facility. The surrounding residential context also generates transportation-related conflicts. All traffic, including heavy vehicles, heading to and from

Figure 16. RTAHP Surrounding Land Use, 2015



the installation must travel through a neighborhood of single-family homes, creating a nuisance and potential safety risk for residents.

Commercial and general aviation, flight obstructions, and UAS activity create airspace challenges for RTAHP operations. The proximity of the busy Class B airspace of the Dallas Fort Worth International Airport and Dallas Love Field imposes altitude restrictions on flights and reduces the ability of RTAHP units to vary routes. The City of Dallas recently rejected a proposal for a gas well to the southeast of the heliport due to concerns that it would be a flight hazard. Installation personnel have reinforced the concern that UAS activity is an increasing security and encroachment issue for air operations.

While the City of Dallas has explored re-use opportunities for the overall site, RTAHP is the long-term tenant with an expectation of continued tenancy. Joint site use produces some compatibility issues. The city and neighboring businesses use parts of the vacant runway for vehicle storage and police driver training, limiting operational use and causing liability concerns. According to stakeholder feedback, infrastructure is aging and inadequate, including a bridge just inside the installation gate that may require repair. The site is subject to a long-standing Settlement Agreement between the City of Dallas and the US Navy in which the Navy agreed to assume the cost of environmental cleanup. Despite prior cleanup activity, the Navy has indicated that there will be delays and additional costs in achieving full soil and water cleanup to residential standards by 2017. Resolution of ongoing remediation issues could affect future use of the site. Contamination also affects nearby Mountain Creek Lake.

RTAHP Communication and Coordination

To date, military and community stakeholders at RTAHP have not participated in a formal process to coordinate on compatibility issues. Continued challenges and the risk of more operational constraints, however, have heightened RTAHP's interest in building stronger relationships with surrounding communities. Community stakeholders have expressed interest in using existing communication channels, rather than the creation of new process, to increase awareness of issues and strengthen coordination.

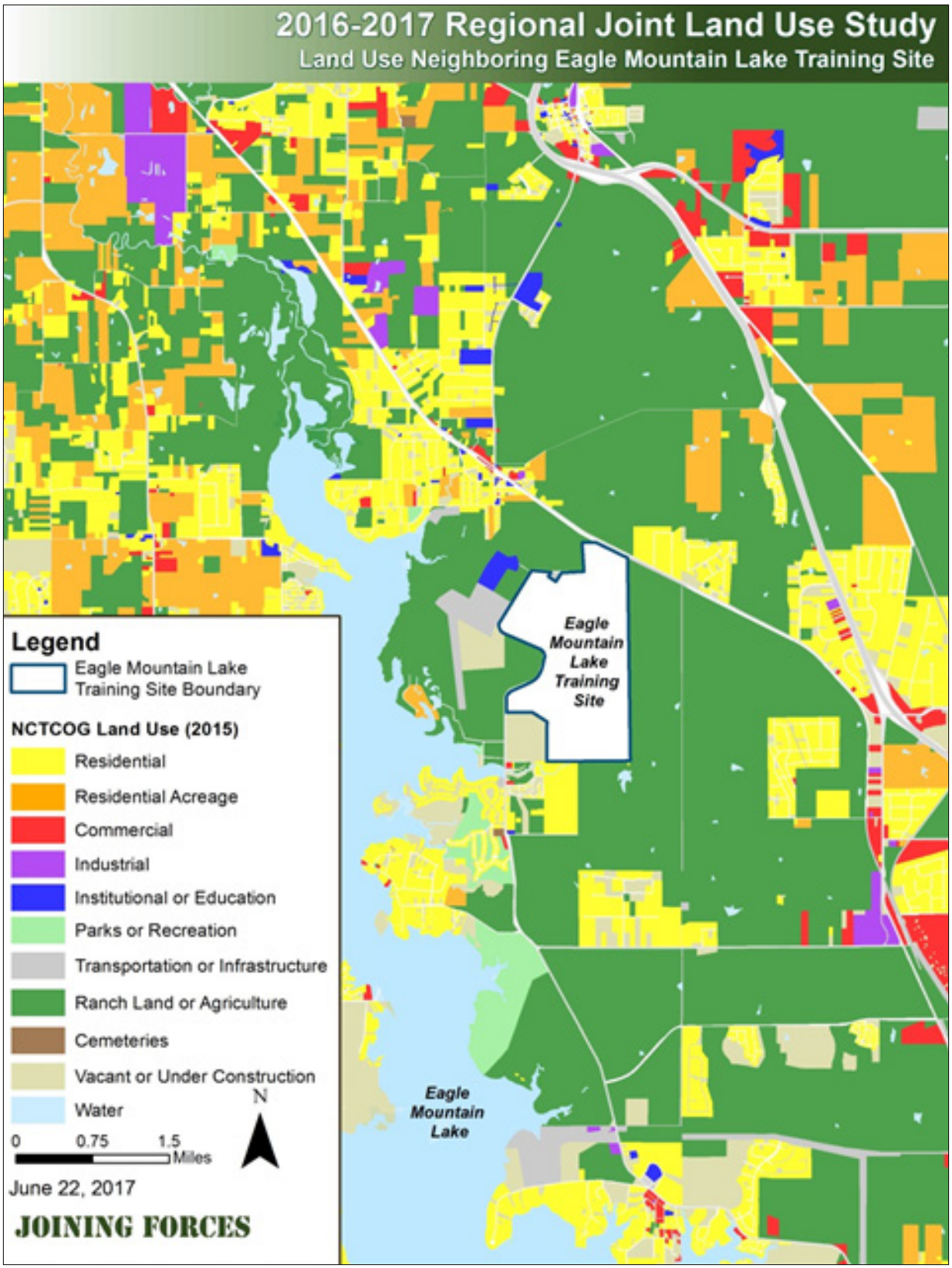
Ancillary Sites Compatibility

In addition to the four high-intensity installations, the *Joining Forces* study assessed compatibility at ancillary sites that provide training assets in support of higher intensity facilities.

Eagle Mountain Lake Facility

Fort Wolters manages the Eagle Mountain Lake Facility, which is east of the Kenneth Copeland Airfield in Tarrant County (see **Figure 8**). **Figure 17** shows surrounding land use. Energy infrastructure and development pose the most significant encroachment threats to the facility. Proposed wind turbines near the installation would create a potential flight hazard for operating aircraft. Continued strong growth pressure in Tarrant County could bring more housing and commercial activity closer to the site.

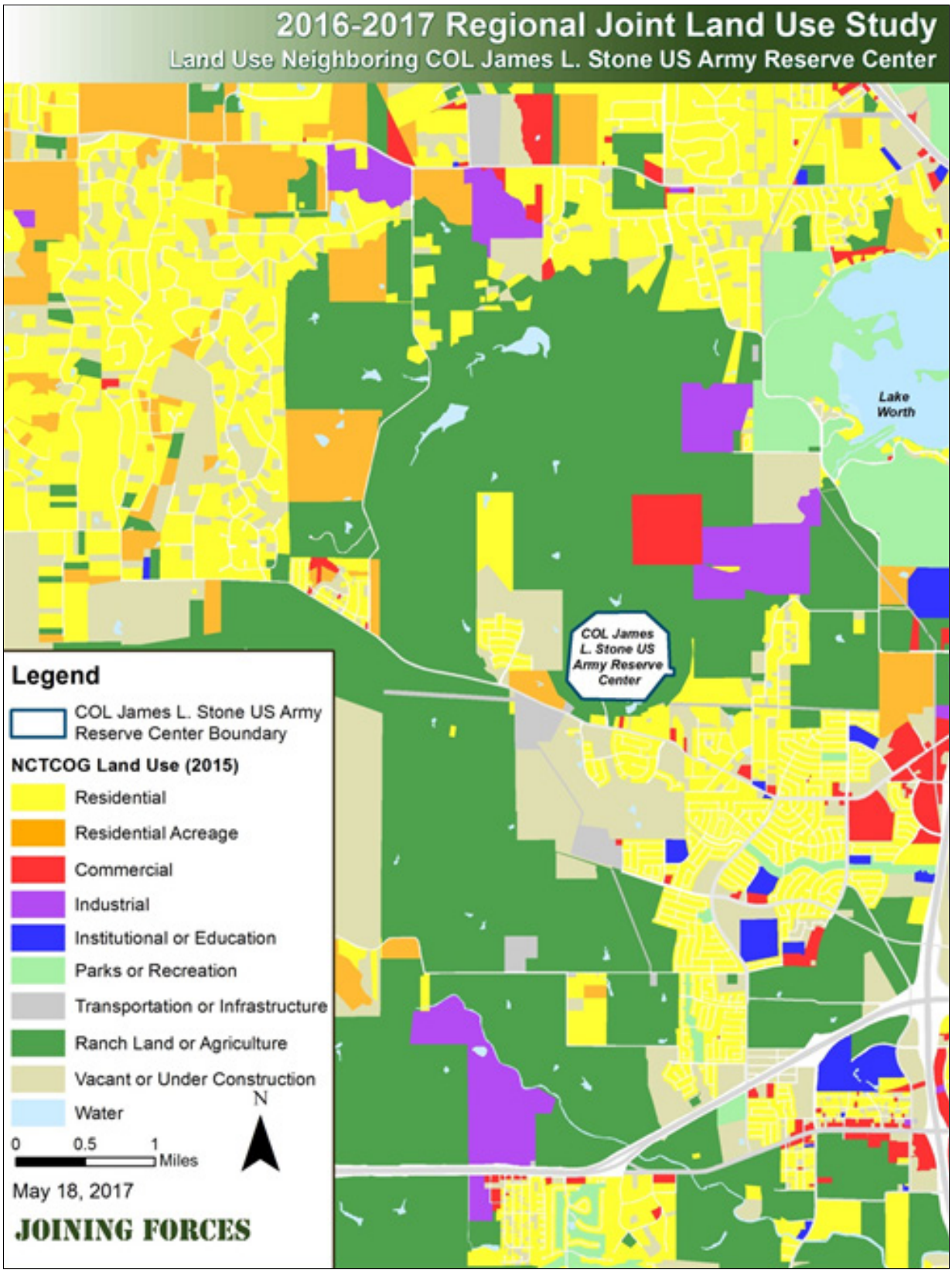
Figure 17. Eagle Mountain Lake Surrounding Land Use, 2015



Colonel Stone Army Reserve Center

The Colonel Stone Army Reserve Center is in unincorporated Tarrant County but is very close to the City of Fort Worth (see **Figure 9**). **Figure 18** shows surrounding land use. Development, energy infrastructure, and transportation are the primary compatibility factors affecting installation operations. Subdivisions built in the past decade surround the southern and western boundaries, increasing the risk of noise sensitivity. High levels of activity at the installation could produce traffic safety concerns around the entrance. Continued growth could hamper operational capacity by exacerbating traffic issues and increasing the risk of noise complaints.

Figure 18. Colonel Stone Surrounding Land Use, 2015



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5

COMPATIBILITY STRATEGIES

5 Compatibility Strategies

One of the unique aspects of the North Texas study area is its diversity–in terms of adjacent land use and growth patterns, the type and intensity of operations conducted at the installations, and differing mission encroachment threats and community impacts experienced. Stakeholders vary widely in the level and formality of current military-civilian communication and coordination processes.

To recognize this diversity, the *Joining Forces* JLUS has developed a series of compatibility menus organized around each installation and set of affected communities (see **Technical Appendix B** for the full tables). As noted earlier, the JLUS is strictly an advisory document that identifies tools and processes available to each study partner. The menus offer a wide range of strategies that partners can adapt to reflect the resources, needs, and interests of their local context. The menus include strategies grouped into the general categories (in alphabetical order) shown in **Table 6**.

Table 6. Compatibility Strategy Categories

CATEGORY	TYPE OF STRATEGIES	COMPATIBILITY ISSUES ADDRESSED
Air Quality	Regional environmental analysis of aircraft emissions	Air pollution and required air quality compliance
Aviation and Airspace Safety	Communication and outreach on regional and local airspace use; state and local regulations for small UAS operations	Airspace congestion; interference of small general aviation aircraft or UAS with training activities (Technical Appendix H)
Communication and Coordination	Information sharing and consultation to increase awareness	Multiple issues (Technical Appendix J)
Economic Development	Strategic investments and public-public, public-private (P4) partnerships	Multiple issues through potential shifting of operations to less intensively used facilities

Table 6. Compatibility Strategy Categories (cont.)

CATEGORY	TYPE OF STRATEGIES	COMPATIBILITY ISSUES ADDRESSED
Energy Infrastructure	Outreach and consultation; formal permitting processes for siting	Vertical intrusions; radar and NAVAID interference (Technical Appendix G)
Environmental/Cultural Resources	Environmental analysis; conservation easements	Multiple issues through creation of natural buffers
Frequency and Spectrum Management	Outreach and consultation; formal permitting processes for siting; de-confliction of use	Frequency availability; frequency communication and interference; potential radar interference from wind turbines; integration of new technologies
Land Use/Urban Development	Zoning; design and siting guidelines; infrastructure planning	Multiple issues through compatible land use planning (Technical Appendix I)
Local Government Plans	Comprehensive and sub-area plans; joint consultation	Multiple issues
Military Plans/Operations	Feasible operational adjustments; environmental analysis; community outreach to raise awareness	Multiple issues
Noise Management/ Avoidance	Structure attenuation; feasible operational adjustments	Noise exposure in communities
Outdoor Lighting/Signs	Sensitive (dark sky) lighting applications	Light pollution/glare
Physical Security	Perimeter reinforcement; signage	Trespass

Table 6. Compatibility Strategy Categories (cont.)

CATEGORY	TYPE OF STRATEGIES	COMPATIBILITY ISSUES ADDRESSED
Statewide Policy/ Legislative Actions	Advocacy and support for statewide policy	County land use authority; energy infrastructure; strategic capacity investments; community development notification; dark sky lighting; military compatible annexation reform
Stormwater Management	Outreach; low impact development; infrastructure improvements	Flooding (Technical Appendix K)
Transportation	Roadway upgrades; gate improvements; access improvements	Roadway congestion; gate congestion; military/civilian traffic conflicts

No single strategy can reduce or eliminate all of the current or anticipated issues identified in the *Joining Forces* process. Instead, the tools work in concert to address as many compatibility factors as possible. The compatibility menus contain 152 action steps, some of which build on each other to establish longer-term tools or processes that promote partnerships and enhance communication and collaboration. The menus organize strategies with the highest priority and shorter-term actions at the top of each category followed by lower priority and longer-term measures.

Protection of the military mission requires collaboration beyond local governments to include state and regional agencies, agriculture, energy producers, recreational interests, utility and transportation entities, economic development agencies, environmental groups, and the private sector. The NCTCOG, and increasingly the State of Texas, plays a significant role in promoting military-civilian compatibility. State and regional support and resources are particularly critical for addressing complex or emerging encroachment issues (UAS, airspace management); coordinating action on large-scale projects with potential impacts that span multi-jurisdictional areas (energy infrastructure); and formalizing clear and consistent communication processes, such as real estate disclosure and installation/community consultation. The ability to articulate a coordinated regional vision for compatibility is of value in highlighting common interests and concerns among all

installations in North Texas and attracting state and DoD resources in support of current and future military missions. To stress this comprehensive approach to encroachment management, the JLUS developed a regional menu of compatibility strategies focused on overarching issues.

In developing the menus, the *Joining Forces* Policy Committees, in collaboration with the planning team, confirmed a set of compatibility factors based on analysis of existing and foreseeable conditions and public input (see **Section 4**). The Committees then evaluated and refined a broad array of potential compatibility solutions appropriate for their local contexts.

Given the number of strategies and study partners, the complexity of some compatibility issues, and finite resources for implementation, *Joining Forces* emphasizes a phased approach that focuses first on foundational, near-term actions. To assist in organizing the region's implementation efforts, the planning team facilitated a dialogue with Committee members to identify the most critical of the high priority and short-term (1 to 2 years) action steps from among the longer list of available strategies. The Committees drew from the following criteria to identify those actions that:

- Represent an easy win and can be put into place quickly;
- Contribute to building an organizational framework for cooperation beyond the current study;
- Address another time sensitive action that could affect compatibility, such as an upcoming development project in the study area or a state legislative activity;
- Address an ongoing compatibility issue that has a major impact, especially related to safety on military operations or community; or
- Address an ongoing compatibility issue for which there are no existing tools or policies in place within the region or surrounding communities.

The selection of critical items is meant to assist all *Joining Forces* partners in prioritizing their implementation efforts. The list of priority actions varies across the region. The remainder of **Section 5** highlights the top actions selected for each area, as well as regional strategies. Strategies for installations and affected communities include actions appropriate both for the military and local governments. Some actions bundle related strategies to create a linked set of activities that work in concert to address issues. The full compatibility menus remain as a comprehensive toolkit that all partners can revisit and adapt as appropriate to meet changing conditions, needs, and goals (see **Technical Appendix B**).

Regional Actions

While most compatibility strategies are geared toward a specific installation or set of local communities, other measures require broader implementation. These strategies typically address compatibility issues that are common across all of the region's installations. Management of their associated impacts tends to cross jurisdictional boundaries. Airsheds, watersheds, energy infrastructure systems, and airspace, for example, all stretch over larger geographies, encompassing numerous governments. As a result, these strategies must draw from the support of multiple federal, state, local, and private sector actors. Other tools, such as targeted land use authority in unincorporated areas, involve changes in the current policy environment. *Joining Forces* identifies these actions as part of a regional compatibility menu to encourage a comprehensive, coordinated approach to encroachment management in North Texas.

The regional compatibility menu identifies 17 strategies (see **Technical Appendix B**). Five of the strategies are high priority and short-term actions:

- Address the security and safety risks associated with increasing hobbyist UAS activity near airfields or other secure facilities;
- Create a region-wide forum for communication and advocacy for compatible development in communities surrounding military installations;
- Promote an early notification and consultation process regarding siting of tall structures (e.g. energy and communications infrastructure);
- Promote early outreach with energy developers and regulators during the project planning phase to shape compatible siting decisions; and
- Actively pursue state legislation that enables local governments to implement targeted land use controls on unincorporated land.

Of the five strategies, stakeholders identified three critical actions related to UAS outreach, creation of a region-wide forum, and advocacy for a statewide policy/legislative initiative enabling local governments to use targeted land use controls near military operations. Given its ongoing function as a facilitator, convener of diverse interests, and technical resource, NCTCOG will play an essential role in advancing these regional strategies. **Table 7** expands on these key regional compatibility actions.

Table 7. High Priority Regional Implementation Plan

Action - UAS Outreach: Conduct educational outreach with communities to increase awareness of the security and safety risks associated with UAS operations near airfields and military facilities and offer technical assistance to local law enforcement agencies to identify and prevent unauthorized or unsafe drone use in the community

Purpose: Military stakeholders have noted a rise in UAS activity near installations. Small UAS create a risk of mid-air collision with low-flying aircraft or can intrude on training or other secured areas, posing a threat to military personnel and sensitive operations. Despite the increasing popularity of drones, many hobbyist operators may be unaware of these risks. Increased outreach in the community would improve awareness of UAS impacts, deter unsafe operations, and empower local law enforcement officials to recognize and stop unauthorized activity.

Milestone Implementation Actions:

- Collaborate with military installations and regional airports to determine appropriate "no-fly" zones for UAS
- Coordinate with the FAA to align local actions with federal policy and identify appropriate roles for local officials
- Publish a brochure that identifies UAS risks to military operations and highlights FAA guidelines on small UAS operations
- Post UAS-related technical resources and policy/regulatory updates on the NCTCOG Aviation Planning and Education web site
- Conduct specific outreach with city and county law enforcement to assist them in identifying UAS threats and establishing penalties (e.g. fines)
- Collaborate with FAA and DoD to define Temporary Flight Restrictions over military facilities

Lead Partner: NCTCOG

Supporting Partners: Military Installations, Regional Airports, City and County Governments, FAA

Geographic Area: Clear zones and accident potential zones; airfield clearance zones and portions of Part 77 imaginary airspace; drop zones; low-level approach and departure paths; and/or other specified distances from airfields, range training areas, or installation perimeters

Table 7. High Priority Regional Implementation Plan (cont.)

Action – Regional Forum: Build on existing coordination bodies, such as NAS Fort Worth JRB's RCC and the state TCC, to create a region-wide forum for communication and advocacy of the military missions, installations, and training assets across North Texas

Purpose: The RCC and TCC both function effectively as coordinating bodies for NAS Fort Worth JRB and statewide issues respectively. However, no comparable umbrella body exists to articulate common interests among the four major installations of North Texas. Creation of a region-wide advisory group would enable all *Joining Forces* partners to identify overarching issues, advocate in a coordinated fashion for federal and state resources, highlight market attractiveness to defense-related private sector businesses, and continue dialogue on the sharing of training assets or the potential shifting of operations and training activity within the region.

Milestone Implementation Actions:

- Identify participating representatives of the region-wide body
- Define basic organizational roles and responsibilities, and areas of focus through bylaws and operating procedures
- Identify an existing organizational structure to house regional activities (e.g. RCC or TCC)
- Convene a yearly forum of *Joining Forces* military and community stakeholders to communicate updates in missions and operational activities, identify common interests and available resources, track progress on compatibility actions, and jointly pursue legislative and funding opportunities
- Participate in statewide coordination among communities undergoing Joint Land Use Studies or implementing recommendations from a JLUS report

Lead Partner: NCTCOG

Supporting Partners: Military Installations, City and County Governments, Texas Military Department, TCC, Texas Military Preparedness Commission

Geographic Area: *Joining Forces* region and statewide

Table 7. High Priority Regional Implementation Plan (cont.)

Action - Targeted Local Government Land Use Controls: Actively pursue state legislation that enables local governments to implement targeted land use controls on unincorporated land in specified proximity to military installations and training areas

Purpose: The State of Texas does not explicitly grant counties the authority to zone unincorporated land. Since much of the rural land surrounding *Joining Forces* installations is unincorporated, this lack of zoning authority creates a significant implementation gap for jurisdictions near Camp Maxey and Fort Wolters, as well as areas around ancillary facilities. The state legislature has granted some counties the authority to enact targeted zoning powers near military installations.

Milestone Implementation Actions:

- Continue to identify targeted zoning around military installations as a legislative priority for the TCC, RCC, and *Joining Forces* region-wide body
- Highlight best practice examples from counties that currently enact land use controls near installations
- Meet with administrative staff of area legislators and discuss the sponsorship and drafting of proposed legislation to mitigate the impact of incompatible development and practices on military operations
- Prepare to provide expert testimony during Legislative Session in support of bill passage

Lead Partners: Military Installations, TCC, NCTCOG

Supporting Partners: City and County Governments

Geographic Area: Unincorporated counties

NAS Forth Worth JRB and Communities Actions

NAS Fort Worth JRB and surrounding communities have been engaged in ongoing compatibility planning since the 2008 JLUS. The base actively participates in ongoing community planning initiatives. Similarly, two surrounding communities have adopted regulatory overlays to address noise and air safety impacts. As a result, the emphasis of *Joining Forces* in the area is on refining established communication processes and filling gaps in the regulatory and policy tools available to local communities.

The NAS Fort Worth JRB compatibility menu identifies 39 strategies (see **Technical Appendix B**). Twelve of these strategies are high priority and short-term actions:

- Identify specific off-base areas vulnerable to security and safety threats from unauthorized UAS activity for purposes of designating drone "no fly zones" and coordinate with regional and local government efforts to create appropriate UAS ordinance adhering to relevant federal and state regulations;
- Incorporate stakeholder feedback to identify improvements to the RCC Development Review Web Tool to ensure continuity in use and enhance its effectiveness as a coordination and communication platform;

NAS Fort Worth JRB
Source: NAS Fort Worth JRB

- Create a Technical Subcommittee of the RCC to share best practices and assist in the implementation of changes to the RCC Development Review Tool;
- Support implementation of HB 890 (85th Texas Legislature, Regular Session) by ensuring the ready availability of compatibility-related studies, such as the most recent NAS Fort Worth JRB AICUZ and *Joining Forces* JLUS;
- Prepare and distribute a "welcome packet" with information on base background, mission, and operations for incoming residents to promote an understanding of operations and potential impacts as neighborhoods transition and redevelop;
- Coordinate on the siting of energy infrastructure to reduce safety threats to aviation activity through updated mapping of the location of energy infrastructure and use of the RCC tool to facilitate consultation on siting decisions;
- Explore REPI Program projects within areas around the main base or/and near off-base training areas;
- Explore adoption of a land use/development regulatory overlay in additional communities to promote compatibility within clearly defined planning zones, including noise contours, and airfield APZ;
- Continue to support area development/in-fill plans and designs that are consistent with the US Navy's AICUZ land use compatibility guidelines and maintain safety with aircraft operations along the extended centerline of the assault landing strip on NAS Fort Worth JRB;
- Adopt sound attenuation building standards and/or energy efficiency practices to achieve indoor noise reduction in the construction of sensitive receptors, such as housing, schools, or medical facilities within noise zones associated with airfield operations;
- Strengthen awareness and promote the implementation of integrated Stormwater Management (iSWM™) strategies and Low Impact Development (LID) techniques to reduce flooding risks across the watershed;
- Increase the capacity and function of existing stormwater infrastructure through the re-grading of ditches and cleaning out culverts along highway corridors and the implementation of engineering improvements in storm drain inlets and in upstream and on-system capture areas; and
- Continue implementing priority transportation and mobility projects to enhance access around NAS Fort Worth JRB and surrounding communities, including planned improvements to Meandering Road and the SH 183 and 199 corridors.

Of the 13 strategies, stakeholders identified three critical actions related to improvement of the RCC Development Review Web Tool (see **Technical Appendix F**), pursuit of potential REPI conservation partnerships, and advocacy for statewide compatibility initiatives. **Table 8** expands on these key compatibility actions.

Table 8. High Priority NAS Fort Worth JRB and Communities Implementation Plan

Action - RCC Development Review Web Tool: Incorporate stakeholder feedback to identify improvements to the RCC Development Review Web Tool to ensure continuity in use and enhance its effectiveness as a coordination and communication platform

Purpose: As an outgrowth of the prior JLUS, NCTCOG hosts the RCC Development Review Tool, a web-based clearinghouse to track and review proposed community projects and initiatives. While the tool functions as an effective platform for facilitating consultation on potential compatibility impacts, turnover of personnel and site access issues have contributed to a lack of continuity in use. Consistent and expanded use of the tool would further strengthen compatibility dialogue.

Milestone Implementation Actions:

- Create a Technical Subcommittee of the RCC to share best practices and assist in the implementation of changes to the RCC Development Review Tool
- Provide training, particularly to new RCC members and planning and technical staff
- Align the tool with municipalities' existing workflows to facilitate incorporation into daily activities
- Update the web design and mapping component of the tool, including use of an interface such as ArcGIS Online to enable better data collection and spatial data management
- Incorporate additional categories and mapping layers, such as zoning overlays, to make the tool more robust and relevant for the end user
- Provide submittal criteria for items of interest that impact military operations, such as land use plan amendments, major thoroughfare plan amendments, requests for zoning and rezoning of properties, Master Development Plans and Planned Unit Developments, Extraterritorial Jurisdiction boundary adjustments, etc.

Lead Partner: NCTCOG

Supporting Partners: NAS Fort Worth JRB, Municipalities, Tarrant County

Geographic Area: Tarrant County and Municipalities

Table 8. High Priority NAS Fort Worth JRB and Communities Implementation Plan (cont.)

Action – REPI Partnerships: Explore REPI Program opportunities for military- and conservation-based projects within areas around the main base or/and near off-base training areas

Purpose: REPI provides funding on a competitive basis for the purchase of development interests in the properties of voluntary sellers. The resulting agreements limit the use of land for compatibility with military missions, while preserving, or introducing, habitat and other sensitive environmental resources and creating a natural buffer that protects areas surrounding installations and training areas from incompatible development.

Milestone Implementation Actions:

- Meet with state and regional stakeholders to introduce conservation objectives, partnerships, and benefits to the community and base
- Identify potential areas for land preservation and conservation programs through partnerships with land conservation organizations and land trust agencies
- Explore potential statewide partnerships with Texas A&M University, the Texas A&M AgriLife Extension Service, and the TCC to prepare a strategic plan for identifying place-based conservation pilots, and preparing nomination documentation to establish Texas REPI and Sentinel Landscapes projects
- Align possible REPI areas around the main base of NAS Fort Worth JRB with regional and local conservation priorities or opportunities for the voluntary acquisition of land in airfield AICUZ areas

Lead Partner: NAS Fort Worth JRB

Supporting Partners: Natural Resources Conservation Service, Texas A&M University, Texas A&M AgriLife Extension Service; US Fish & Wildlife Service, DoD, City and County Governments, NCTCOG, Trust for Public Land

Geographic Area: Conservation lands as identified near NAS Fort Worth JRB, Fort Wolters, or other off base training areas

Table 8. High Priority NAS Fort Worth JRB and Communities Implementation Plan (cont.)

Action – Statewide Compatibility Initiatives: The *Joining Forces* regional compatibility menu identifies a series of statewide legislative actions to mandate, formalize, standardize, or enable coordination processes and regulatory tools for land use control in unincorporated areas; energy siting; UAS operations; and civilian-military consultation on proposed ordinances, rules, plans or structures. This action bundles support for these initiatives into a coordinated advocacy effort for increased statewide compatibility planning.

Purpose: As noted earlier, the lack of county zoning authority creates a significant implementation challenge for *Joining Forces* installations. Without formalized consultation procedures in place, the region also has localized communication gaps that could hamper encroachment management. Statewide provisions for real estate disclosure (passed in 2017), targeted county zoning authority (granted to select county jurisdictions outside of North Texas), energy siting, and general civilian-military consultation on designated actions of interest would create a clear, consistent regulatory and policy framework for all defense communities engaged in compatibility planning.

Milestone Implementation Actions:

- Monitor proposed legislation that encourages military-community compatibility
- Continue to identify statewide compatibility initiatives as legislative priorities for the TCC, RCC, and region-wide body
- Meet with administrative staff of area legislators and discuss the sponsorship and drafting of proposed legislation to mitigate the impact of incompatible development and practices on military operations
- Meet with representatives of state-level agencies, such as ERCOT to facilitate statewide coordination and data sharing
- Prepare to provide expert testimony during Legislative Session in support of bill passage

Lead Partners: Military Installations, NCTCOG, TCC, *Joining Forces* region-wide body

Supporting Partners: City and County Governments

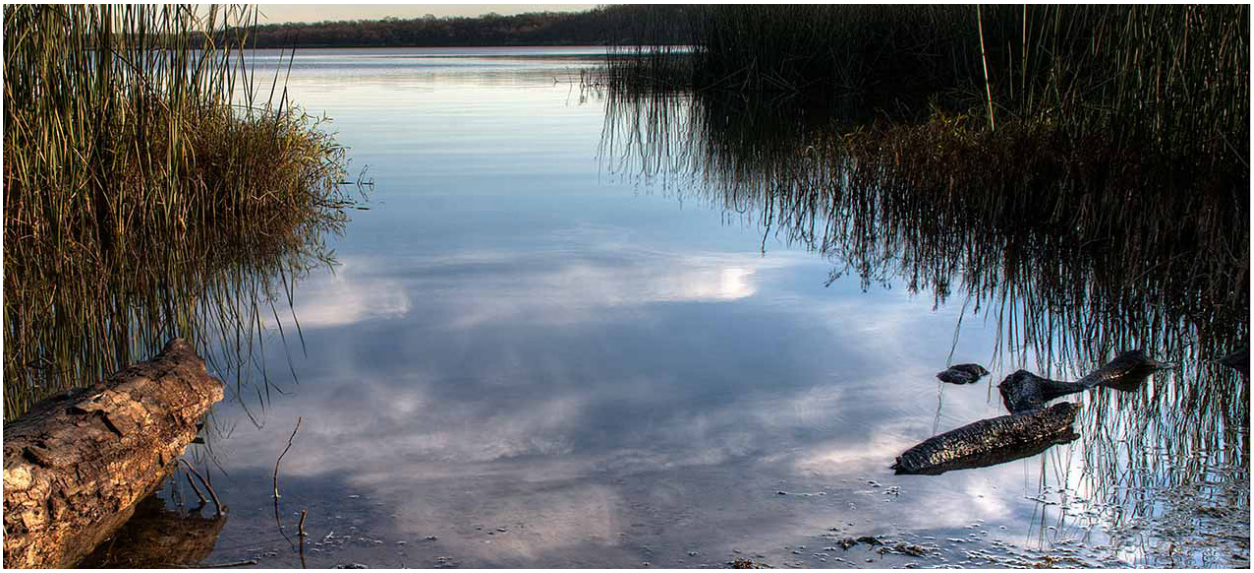
Geographic Area: *Joining Forces* region

Fort Wolters and Communities Actions

Fort Wolters enjoys a strong collaborative relationship with the City of Mineral Wells, and the surrounding community has expressed a strong interest in accommodating increased operations at the installation. However, there are no formal, standing channels of communication and coordination between the installation and surrounding communities. Interaction with the Counties of Palo Pinto and Parker is absent. Much of the area surrounding the installation is in unincorporated Parker County, creating an implementation challenge due to a lack of land use control authority. The focus of the *Joining Forces* study for this area is on building the basic structure for continued communication and coordination between military and civilian stakeholders and in addressing current gaps in the ability to shape compatible land use patterns in the future.

The Fort Wolters and Communities compatibility menu identifies 33 strategies (see **Technical Appendix B**). Eleven of these strategies are high priority and short-term actions with a primary emphasis on developing strong communication mechanisms:

- Identify specific off-installation areas vulnerable to security and safety threats from unauthorized UAS activity for purposes of designating drone "no fly zones";
- Continue briefings with regional partners to build support and strengthen engagement in ongoing *Joining Forces* compatibility implementation activities, particularly at the county level;
- Create formal, ongoing channels of communication and coordination between Fort Wolters and local communities to exchange information on major community actions and military operations that have potential compatibility impacts;
- Develop outreach materials to include information on mission, economic impact, and clear points of contact at Fort Wolters, as well as a map highlighting general operational impacts, such as noise in surrounding communities;
- Establish a formal coordination process with the entities that manage Lake Mineral Wells State Park to ensure that ongoing operations, management actions, and plans consider environmental and security impacts on Fort Wolters operations;
- Support implementation of HB 890 (85th Texas Legislature, Regular Session) by ensuring the ready availability of compatibility-related studies, such as the *Joining Forces* JLUS;
- Explore use of State of Texas authority to establish a JAZ Board to prevent aviation-related hazards around the Fort Wolters airfield;
- Coordinate on the siting of energy infrastructure to reduce safety threats to aviation activity, including updated mapping of the location of energy infrastructure;



Lake Mineral Wells State Park
Source: Texas Parks and Wildlife

- Collaborate with local communities to reinforce existing safety and reporting guidelines in the event of discovery of UXO on off-installation land;
- Coordinate with Lake Mineral Wells State Park on security issues and enhance outreach to recreational users on the safety risks associated with trespass onto Fort Wolters; and
- Identify strategic investments, such as improvements in infrastructure to support a potential increase in installation capabilities at Fort Wolters and/or compatible re-use of the Fort Wolters Industrial Park.

Of the 10 strategies, stakeholders identified two critical actions related to establishing an ongoing military-civilian communication structure and pursuing a JAZ Board. **Table 9** expands on these key compatibility actions.

Table 9. High Priority Fort Wolters and Communities Implementation Plan

Action – Communication/Coordination Structure: Create formal, ongoing channels of communication and coordination between Fort Wolters, local jurisdictions, and Lake Mineral Wells State Park to facilitate consistent dialogue on major community actions, park plans, and military operations that have potential compatibility impacts.

Purpose: The absence of standing channels of coordination between the installation and surrounding communities, particularly at the county level may lead to gaps in communication that result in incompatibilities. The adjacency of Lake Mineral Wells State Park also introduces another jurisdictional authority whose actions can affect Fort Wolters operations. Establishing consistent processes through structured meetings, clear points of contact, and defined expectations for information sharing will strengthen dialogue and ongoing compatibility efforts.

Milestone Implementation Actions:

- Collaborate with NCTCOG, as necessary, on the organizational structure of the coordination body and potential technical support
- Conduct outreach to county officials to build support for participation in compatibility efforts
- Identify participating representatives of the coordination body to include a representative from Lake Mineral Wells State Park
- Define basic organizational roles and responsibilities, and areas of focus through bylaws and operating procedures
- Convene at least a yearly session of the coordinating body and develop an email database for more frequent, informal communication

Lead Partners: Fort Wolters, City of Mineral Wells

Supporting Partners: NCTCOG, Texas Military Department, Parker County, Palo Pinto County, Texas Parks & Wildlife Department

Geographic Area: Palo Pinto and Parker Counties and Municipalities

Table 9. High Priority Fort Wolters and Communities Implementation Plan (cont.)

Action – Explore JAZ Board: Explore use of State of Texas authority to establish a JAZ Board to prevent aviation-related hazards around the Fort Wolters airfield.

Purpose: Surrounding unincorporated areas limit the ability to shape compatible land use patterns around much of Fort Wolters. State law grants a JAZ board the same power to adopt, administer, and enforce airport hazard area zoning regulations or airport compatible land use zoning regulations as a municipality. These regulations are intended to protect the safety of adjacent lands exposed to noise or safety risks associated with airport operations, including the taking off and landing of aircraft. The code specifically includes airports operated by defense agencies. Permissible land use authority must fall within a rectangular area bounded by lines that are 1.5 miles from the centerline of a runway and 5 miles from each end of the paved surface of a runway.

Milestone Implementation Actions:

- Conduct mapping to determine the area of JAZ Board land use authority around Fort Wolters
- Based on feasibility of a JAZ Board, identify appointees for an airport zoning commission
- Conduct more detailed compatible land use mapping in the area of authority
- Develop airport zoning regulations

Lead Partners: City of Mineral Wells, Palo Pinto County, Parker County

Supporting Partners: Fort Wolters, Texas Military Department, NAS Forth Worth JRB

Geographic Area: Statutorily defined JAZ area around runway surface

Camp Maxey and Communities Actions

Camp Maxey enjoys a supportive relationship with the City of Paris, and the surrounding community has expressed a desire to accommodate increased operations at the installation. However, there are no formal, standing channels of communication and coordination between the installation and surrounding communities. While Paris is to the south, the nearby census-designated community of Powderly and other parts of unincorporated Lamar County surround the installation. The adjacency of county land creates the common challenge of a lack of land use control.

The Camp Maxey and Communities compatibility menu identifies 30 strategies (see **Technical Appendix B**). Ten of these strategies are high priority and short-term actions with a primary emphasis on developing strong communication mechanisms and addressing trespass risks:

- Identify specific off-installation areas vulnerable to security and safety threats from unauthorized UAS activity for purposes of designating drone "no fly zones";
- Work with local airports and conduct outreach to the general aviation community to communicate safety risks to low-flying aircraft during active range operations and prevent unauthorized overflight near Camp Maxey;
- Create formal, ongoing channels of communication and coordination between Camp Maxey and local communities to exchange information on major community actions and military operations that have potential compatibility impacts;
- Establish a formal coordination process with the entities that manage Pat Mayse Lake reservoir and Wildlife Management Area to ensure that ongoing operations, management actions, and plans consider environmental and security impacts on Camp Maxey operations;
- Support implementation of HB 890 (85th Texas Legislature, Regular Session) by ensuring the ready availability of compatibility-related studies, such as the *Joining Forces* JLUS;
- Coordinate on the siting of energy infrastructure to reduce safety threats to aviation activity, including updated mapping of the location of energy infrastructure;
- Coordinate with the State Legislature and Lamar County representatives to establish the legal authority to implement land use controls that promote compatibility on unincorporated lands near critical Camp Maxey operations;
- Coordinate with Pat Mayse Lake reservoir and Wildlife Management Area on security issues, and enhance outreach to recreational users on the safety risks associated with trespass onto Camp Maxey;
- Work with the USACE to explore strategies to reduce the risk of trespass; and

- Coordinate maintenance of easement road on Camp Maxey and regulate use to reduce potential trespass and safety conflicts with training operations.

Of the 10 strategies, stakeholders identified four critical actions related to establishing an ongoing military-civilian communication structure, reducing instances of trespass onto military lands, and a suite of strategies to protect the mission capabilities of Camp Maxey. The Committee supported advocacy for statewide legislation to enable targeted county zoning near military installations. **Section 5.1** addresses this action as a regional strategy. **Table 10** expands on key compatibility actions for Camp Maxey and its environs.

Table 10. High Priority Camp Maxey and Communities Implementation Plan

Action – Communication/Coordination Structure: Create formal, ongoing channels of communication and coordination between Camp Maxey, local jurisdictions, and Pat Mayse Lake reservoir and Wildlife Management Area to facilitate consistent dialogue on major community actions, park use, and military operations that have potential compatibility impacts.

Purpose: The absence of standing channels of coordination between the installation and surrounding communities may lead to gaps in communication that result in incompatibilities. The adjacency of Pat Mayse Lake reservoir and Wildlife Management Area also introduces another jurisdictional authority whose actions can affect Camp Maxey operations. Establishing consistent collaboration processes through structured meetings, clear points of contact, and defined expectations for information sharing will strengthen dialogue and ongoing compatibility planning.

Milestone Implementation Actions:

- Collaborate with Ark-Tex COG on the organizational structure of the coordination body and potential technical support
- Conduct outreach to county officials to build support for participation in compatibility efforts
- Identify participating representatives of the coordination body to include a representative from Pat Mayse Lake reservoir and Wildlife Management Area
- Define basic organizational roles and responsibilities, and areas of focus through bylaws and operating procedures
- Convene at least a yearly session of the coordinating body and develop an email database for more frequent, informal communication

Lead Partners: Camp Maxey, City of Paris, Lamar County

Supporting Partners: Texas Military Department, Red River Veterans Authority, Ark-Tex COG

Geographic Area: Lamar County and Municipalities

Table 10. High Priority Camp Maxey and Communities Implementation Plan (cont.)

Action – Trespass Reduction: Coordinate with the Texas Parks & Wildlife Department and the USACE to reduce the risk of trespass onto military lands

Purpose: The boundary of Camp Maxey does not extend to the shores of the lake, preventing the installation from effectively securing its northern perimeter. Hunters entering from adjacent recreational lands regularly trespass onto Camp Maxey, posing a safety risk for themselves, as well as for soldiers in the training areas. There is also some risk of hunting on adjacent lands creating a firing hazard onto military lands.

Milestone Implementation Actions:

- Explore moving the Camp Maxey boundary north to the lake, thus eliminating hunting at the northern installation boundary and helping to improve anti-trespass enforcement
- Explore banning hunting (and restricting other access) to the area between Camp Maxey and the lake
- Install signage to indicate safety risks associated with unauthorized entry onto training lands
- Jointly develop outreach materials in printed and digital formats to raise safety awareness among recreational users and hunters and deter trespass

Lead Partners: Camp Maxey, Texas Military Department

Supporting Partners: Texas Parks & Wildlife Department, USACE

Geographic Area: Areas of Camp Maxey with adjacency to public lands on the north

Table 10. High Priority Camp Maxey and Communities Implementation Plan (cont.)

Action – Protect Mission Capabilities: Protect Camp Maxey operations and mission capabilities from threats associated with UAS and small aircraft, energy infrastructure siting, and BASH. This action bundles strategies that reduce aviation, vertical intrusion, and mid-air collision risks to installation operations.

Purpose: Small, non-military aircraft periodically fly low over the eastern portion of the installation during range operations, requiring a halt of firing activity due to safety risks for both the pilot and on-the-ground military personnel. Birds and the nearby siting of energy infrastructure can similarly pose a safety risk due to mid-air collision or intrusions into protected airspace. These strategies are designed to protect mission capabilities by maintaining the safe and efficient use of range and airspace assets.

Milestone Implementation Actions:

- Identify specific off-installation areas vulnerable to security and safety threats from unauthorized UAS activity for purposes of designating drone "no fly zones"
- Jointly develop informational materials with local airports, and conduct outreach to the general aviation community to communicate safety risks to low-flying aircraft over Camp Maxey
- Develop a consistent consultation process with Camp Maxey on the potential siting of energy infrastructure and provide any updated mapping of the location of tall structures
- Establish siting and design standards for uses, such as detention ponds, sanitary landfills, and crops in areas subject to low-level flights
- Coordinate on BASH measures with resource management entities, particularly at Pat Mayse Lake

Lead Partners: Camp Maxey, City of Paris, Lamar County

Supporting Partners: Texas Military Department, USACE, Texas Parks & Wildlife Department

Geographic Area: Airfield clearance zones; drop zones; low-level approach and departure paths; and/or specified distance from airfield or installation boundary

RTAHP and Communities Actions

RTAHP faces a series of complex compatibility challenges, including the long-term lease of the training site from the City of Dallas and a physically constrained training environment both in terms of airspace and the surrounding residential land use pattern. To date, military and community stakeholders at RTAHP have not participated in a formal process to coordinate on these compatibility issues. Continued challenges and the risk of more operational constraints, however, have heightened interest in building stronger relationships. The focus of the *Joining Forces* study in this area is to build a solid foundation for further dialogue by leveraging existing communication channels.

The RTAHP and Communities compatibility menu identifies 32 strategies (see **Technical Appendix B**). Eleven of these strategies are high priority and short-term actions with a primary emphasis on developing stronger communication mechanisms and addressing noise issues:

- Identify specific off-installation areas vulnerable to security and safety threats from unauthorized UAS activity for purposes of designating drone "no fly zones";
- Continue briefings with regional partners to build support and strengthen engagement in ongoing *Joining Forces* compatibility implementation activities;
- Enhance RTAHP participation in established channels of communication for major community actions, such as proposed zoning changes, that have potential compatibility impacts;
- Leverage existing relevant public meetings and communication methods to improve coordination;
- Post compatibility-related studies, such as the *Joining Forces* JLUS, on NCTCOG website to comply with HB 890 (85th Texas Legislature, Regular Session);
- Develop outreach materials to include information on mission, economic impact, and clear points of contact at RTAHP, as well as a map highlighting general operational impacts such as noise in surrounding communities;
- Continue to support a framework for on-site maintenance, infrastructure, and tenant activity that promotes compatible community and military uses at RTAHP through the existing lease agreement, as applicable;
- Coordinate on the siting of energy infrastructure to reduce safety threats to aviation activity and ensure updated mapping of the location of energy infrastructure;
- Use aircraft noise attenuation requirements in the existing building code to promote compatible development within noise contours established for the former Hensley Field;

- Consider sound attenuation building standards and/or energy efficiency practices to achieve indoor noise reduction in the construction of sensitive receptors, such as housing, schools, or medical facilities within noise zones; and
- Initiate outreach to neighborhoods experiencing noise impacts from RTAHP operations, including areas in proximity to RTAHP and Dallas Executive Airport.

Of the 11 strategies, stakeholders identified two critical actions related to improving military-civilian communication. **Table 11** expands on key compatibility actions for RTAHP and the surrounding area.

Table 11. High Priority RTAHP and Communities Implementation Plan

Action – Communication/Coordination Structure: Leverage existing City meetings and communication methods to improve military-civilian coordination

Purpose: The absence of ongoing coordination, particularly in light of complex encroachment threats can heighten the risk of incompatibilities at RTAHP. The use of existing meetings and communication networks within the Cities of Dallas and Grand Prairie enables the quick improvement of information sharing and coordination capabilities, while stakeholders consider longer-term opportunities to develop a more formal organizational structure.

Milestone Implementation Actions:

- Establish clear points of contact in departments, such as the City of Dallas Real Estate Division of the Sustainable Development and Construction Department, the City of Dallas Aviation Department, the City of Grand Prairie City Council Development Committee, and Real Property at the Texas Military Department
- Consider inviting *Joining Forces* partners, as relevant, to participate as a stakeholder in major plan updates and amendments, including Comprehensive Plans, and area, neighborhood, or corridor plans, which could affect RTAHP operations

Lead Partners: RTAHP, City of Dallas, City of Grand Prairie

Supporting Partners: NCTCOG, Texas Military Department, Dallas County

Geographic Area: City of Dallas, City of Grand Prairie, Dallas County

Table 11. High Priority RTAHP and Communities Implementation Plan (cont.)

Action – Enhance Coordination: Encourage communication between RTAHP and local governments related to changes in military operations and proposed local ordinances, rules, plans, or structures that could create compatibility issues nearby military operations, with NCTCOG assisting RTAHP to monitor local government actions

Purpose: As a step beyond the leveraging of existing meetings and communication methods, increased communication would bring additional structure, predictability, and clarity in roles to ongoing military-civilian coordination. In addition to RTAHP and local governments, the participation of other stakeholders, including the USACE, Texas Parks & Wildlife Department, and private utility providers would enhance compatibility. In the longer term, a structured process could also facilitate broader interaction on more complex issues, such as on-site maintenance, infrastructure, and future tenant activity.

Milestone Implementation Actions:

- Identify interested parties and develop a contact list for various coordination efforts
- Develop information sharing protocols, including items of interest, notification procedures, and methods of communication
- NCTCOG should identify resources to assist RTAHP in monitoring development and planning activities in surrounding communities

Lead Partners: RTAHP, City of Dallas, City of Grand Prairie, NCTCOG

Supporting Partners: Texas Military Department, Dallas County

Geographic Area: City of Dallas, City of Grand Prairie, Dallas County

Ancillary Site and MOA Actions

The less intensively used facilities of Eagle Mountain Lake and the Colonel Stone Army Reserve Center face compatibility challenges common to the region's rural installations. Surrounding unincorporated land limits the ability of local partners to regulate development and promote compatible land use patterns. Both facilities, however, are in rapidly growing Tarrant County rather than an outlying metropolitan county, making the areas more susceptible to development pressure and the conversion of agricultural or ranch lands. Given their location, the facilities are more vulnerable to incompatibilities associated with energy infrastructure. Strategies for these areas should focus primarily on improving coordination on land use and development and protecting operations from interference by gas wells or other energy structures.

Priority compatibility strategies for Eagle Mountain Lake Facility are:

- Review Eagle Mountain compatibility issues as part of routine communications by the Fort Wolters/Communities coordination body; and
- Continue outreach that engages stakeholders, including Fort Wolters, Eagle Mountain Lake Facility, Texas Military Department, Tarrant County, the unincorporated Pecan Acres community, and Wise County to build an awareness of compatibility issues, understand growth trends in the area, and coordinate on the siting of energy infrastructure or other potential aviation-related hazards near facility operations

Priority compatibility strategies for Colonel Stone Army Reserve Center are:

- Continue outreach that engages stakeholders, including Colonel Stone Army Reserve Center, Tarrant County, and the City of Fort Worth to build an awareness of compatibility issues, understand growth trends in the area, and coordinate on the siting of energy infrastructure or other potential aviation-related hazards near facility operations; and
- Develop an access and circulation plan for the facility entry to address traffic safety concerns

The Brady and Brownwood MOAs cover the far southwestern part of the study area, overlying portions of 13 counties - Brown, Callahan, Coleman, Comanche, Concho, Eastland, Erath, Hamilton, Llano, McCulloch, Mills, Runnels, and San Saba. Training airspace in the MOAs and MTRs is prone to noise, flight obstruction, and energy infrastructure-related encroachment threats. The expansive geographic area and rural development patterns produce significant challenges for outreach and coordinated planning.

Priority compatibility strategies for counties underlying MOAs are:

- Continue to pursue statewide coordination on the mapping and future siting of energy infrastructure to reduce threats associated with radar interference or aviation hazards;
- Coordinate to develop updated mapping of the location of energy infrastructure in areas underlying airspace;
- Draw from technical analysis of airspace and corridor use, and conduct additional targeted outreach with county officials and stakeholder groups to identify specific areas affected by aviation noise, particularly supersonic booms; and
- Develop a set of outreach techniques, including radio, print, County Extension Offices, social media, or events that allow for effective communication with rural communities. Focus on educational outreach that increases community understanding of the purpose, nature, and type of military training conducted in the region.

6

CONCLUSION

JOINING FORCES

Given the size and diversity of the North Texas region, no single stakeholder can take all of the steps necessary to balance community growth with military mission compatibility. This *Joining Forces* process embodies a continuing partnership among residents, communities, agencies, and the military.

Initial follow-up implementation efforts are likely to focus on preparation of more detailed small area plans, such as a study of compatible re-use options for the City of Mineral Wells facilities on Wolters Industrial Park adjacent to Fort Wolters, development of a regional spatial database to support planning and infrastructure siting decisions, outreach to promote weatherization/sound attenuation practices, and the building of local and regional organizational capacity to maintain collaboration among *Joining Forces* partners.

As the JLUS effort transitions from planning to implementation, all stakeholders are encouraged to revisit their applicable compatibility menus and adapt or add tools as appropriate to meet changing conditions, mission needs, and priorities.

The ability to monitor outcomes is a critical component of sustaining momentum beyond the life of the study. Existing coordination bodies, such as the RCC or a newly formed region-wide committee should carefully track the implementation of recommended actions. In addition to noting the number of measures put into place, stakeholders should measure substantive progress by:

- Collaboratively developing a set of compatibility metrics and organizing results into a report on the state of the North Texas region and its defense communities;
- Conducting periodic surveys of local, regional, state, and DoD stakeholders to gauge the level and effectiveness of coordination activity and identify emerging issues; and
- Developing regional mapping products, such as existing land use around installations or the location of energy infrastructure or other aviation hazards, to inform decision-making and serve as a benchmark of compatibility conditions.

All of these steps encourage a more coordinated, comprehensive approach to compatibility planning and contribute to building a stronger, healthier, and more prosperous region.

JOINING FORCES

Aligning Community & Military Missions

Technical Appendices

November 2017

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Resources

Resources:

Department of Defense

Office of Economic Adjustment

DoD Siting Clearinghouse

HUD Noise Abatement and Control

State of Texas

Texas Military Preparedness Commission

Texas Military Department

Texas A&M - Military Land Sustainability Program

North Central Texas Council of Governments

2016-2017 *Joining Forces* Joint Land Use Study

Regional Coordination Committee and Prior Compatibility

RCC Development Review Web Tool

Aviation Planning and Education

integrated Stormwater Management (iSWM™)

Ark-Tex Council of Governments

Ark-Tex Council of Governments

Regional and Local Compatibility Plans and Policies

Agency/Jurisdiction	Plan or Code
City of Benbrook	2008 JLUS
	PLMC
	NAS Overlay District
	Building Code
City of Fort Worth	Comprehensive Plan
	Building Code
	2008 JLUS
	PLMC
	Naval Air Station/JRB Compatible Use Zones Airport Overlay
City of Lake Worth	2008 JLUS
	PLMC
City of River Oaks	2008 JLUS
	PLMC
	State Highway 199 (SH 199) Master Plan
	State Highway 183 (SH 183) Corridor Master Plan
City of Sansom Park	2008 JLUS
	PLMC
City of Westworth Village	2008 JLUS
	PLMC
	Building Regulations
City of White Settlement	2008 JLUS
	PLMC
NCTCOG	2008 JLUS
	PLMC
	SH 199 Corridor Master Plan
	SH 183 Corridor Master Plan

Agency/Jurisdiction	Plan or Code
Tarrant County	2008 JLUS PLMC
City of Dallas	Airport Noise Contours and Airport Height Overlay Hensley Field (Redmond Taylor Army Heliport or RTAHP) Avigation Easement Building Code and One- and Two-family Dwelling Code

Technical Appendix B.

Compatibility Strategy Menus

Compatibility Strategy Menu - Regional

The table describes the recommended strategies and actions for partners in the *Joining Forces* region to enhance compatibility of land uses around military installations, as well as recommendations for continued cooperation on a range of issues. These actions and strategies respond to issues and opportunities (listed below) identified by elected officials, Department of Defense (DoD) staff, and other stakeholders. These strategies typically address compatibility issues that are common across all of the region's installations and their impacts cross jurisdictional boundaries. As a result, these strategies must draw from the support of multiple federal, state, local, and private sector actors.

Issues/Opportunities:

- Declines in regional air quality could trigger air pollution control measures and reduce flexibility to expand aircraft operations due to emissions limits (**Air Quality**)
- Drones/unmanned aircraft systems (UAS) can create physical hazards, such as midair strikes with aircraft; pose security and safety threats to military installations; or interrupt training flights and operations **(Aviation and Airspace Safety**)
- There is no established mechanism for regular communication among all installations and defense communities in North Texas (**Communication and Coordination**)
- Energy-related infrastructure, including utility-scale wind and solar, transmission lines, and gas wells, can create aviation hazards or interfere with air traffic control and onboard aircraft radar systems (**Energy Infrastructure and Statewide Policy/Legislative Actions**)
- The Electric Reliability Council of Texas (ERCOT) has implemented a Planning Guide policy that requires any Interconnecting Entity to certify that it has notified the DoD Siting Clearinghouse of a proposed generation resource and requested an informal or formal review (**Energy Infrastructure and Statewide Policy/Legislative Actions**)
- Less utilized facilities in the region offer opportunities for better coordination and the sharing of military resources across installations (**Military Plans/Operations and Statewide Policy/Legislative Actions**)
- Installations around the region, particularly Naval Air Station (NAS) Fort Worth Joint Reserve Base (JRB), periodically receive complaints about noise that does not originate from their operations (**Noise Management/Avoidance**)

- Counties in the State of Texas lack zoning authority and are thus less able to shape compatible development patterns on unincorporated land near military installations (**Statewide Policy/Legislative Actions**)
- Texas State House and Senate have passed House Bill (HB) 890, which requires notice to purchasers of real property regarding the impact of military installations; cities and counties must provide access to the latest compatibility studies (**Communication and Coordination** and **Statewide Policy/Legislative Actions**)

Summary of High Priority and Short-term Actions – *Joining Forces* Region

Category	Strategy
Airspace	Conduct educational outreach with communities to increase awareness of the security and safety risks associated with UAS operations near airfields and military facilities and offer technical assistance to local law enforcement agencies to identify and prevent unauthorized or unsafe drone use in the community
Communication	Build on existing coordination bodies, such as the NCTCOG's RCC and the TCC to create a region-wide forum for communication and advocacy of the military missions, assets, and installations across North Texas and participate in statewide JLUS coordination: • Convene a yearly forum of *Joining Forces* military and community stakeholders to communicate updates in missions and operational activities, identify common interests and available resources, and jointly pursue legislative and funding opportunities • Participate in statewide JLUS coordination efforts
Energy	Establish guidelines to promote an early notification and consultation process in which local governments provide regular updates on the siting of energy and communications infrastructure near military installations and aviation training areas within their jurisdictions
Energy	Through coordination with installations, the Texas Commanders Council, and Texas Military Preparedness Commission, conduct early outreach with energy developers and regulators during the project planning phase to increase awareness of potential compatibility challenges and offer technical guidance and resources to develop appropriate mitigation and alternate siting strategies that reduce the impacts of energy infrastructure on military operations
Statewide Policy/Legislative	Actively pursue state legislation that enables local governments to implement targeted land use controls on unincorporated land in specified proximity to military installations and training areas: • Meet with administrative staff of area legislators and discuss the sponsorship and drafting of proposed legislation to mitigate the impact of incompatible development and practices on military operations • Prepare to provide expert testimony during Legislative Session

Regional Compatibility Strategies – *Joining Forces* Region

Strategy	Partners	Area	Priority	Time Frame
Air Quality				
Track future air emissions associated with military aircraft operations in the region as part of compliance with National Ambient Air Quality Standards (NAAQS)	**Lead**: NCTCOG, NAS Fort Worth JRB **Supporting**: Federal, state, and local regulatory agencies	Designated NAAQS non-attainment area	Medium	Short to Mid
Aviation and Airspace Safety				
Increase awareness of the multiple uses of regional airspace and establish an outreach and educational process to reduce unintentional encroachment by private general aviation airspace users • Conduct specific outreach to general aviation pilots	**Lead**: NCTCOG, NAS Fort Worth JRB **Supporting**: FAA, TxDOT, Aviation Division	Airspace in the 16-county region of North Central Texas	High	Short
Track trends in regional airspace use associated with military mission change and/or new aircraft, such as the F-35: • Identify any areas of increasing air traffic volume or conflict, and collaborate with airports and aviation authorities to develop management actions to deconflict congested areas and maximize airspace safety and capacity • Update the North Central Texas General Aviation and Heliport System Plan with any additional mitigation strategies identified	**Lead**: NAS Fort Worth JRB, Dallas-Fort Worth International Airport, Dallas Love Field, Dallas Executive Airport**,** NCTCOG **Supporting**: FAA, TxDOT, Aviation Division	Airspace in the 16-county region of North Central Texas	High	Short to Mid

Strategy	Partners	Area	Priority	Time Frame
Conduct educational outreach with communities to increase awareness of the security and safety risks associated with UAS operations near airfields and military facilities, and offer technical assistance to local law enforcement agencies to identify and prevent unauthorized or unsafe drone use in the community • Develop educational materials for distribution during the ongoing outreach and implementation phase	**Lead**: NCTCOG, Military Installations **Supporting**: Regional Airports, City and County Governments	Airfield clearance zones; drop zones; low-level approach and departure paths; and/or specified distance from airfield and range training areas	High	Short
Develop model UAS guidance and an ordinance for use by local governments to govern the operation of small UAS: • Coordinate with the Federal Aviation Administration (FAA) to ensure that policies are consistent with FAA regulation of national airspace and align with existing pilot and operating rules for small unmanned aircraft • Explore provisions related to restrictions on flying UAS near airports and over specified sensitive uses, such as military installations and training activities • Work with local jurisdictions to promote the implementation of model UAS ordinance provisions and guidelines	**Lead**: NCTCOG, Military Installations **Supporting**: FAA, Regional Airports, City and County Governments	Airfield clearance zones; drop zones; low-level approach and departure paths; and/or specified distance from airfield and range training areas	Medium	Short

Strategy	Partners	Area	Priority	Time Frame
Communication and Coordination				
Build on existing coordination bodies, such as NCTCOG's RCC and the state TCC to create a region-wide forum for communication and advocacy of the military missions, installations, and training assets across North Texas and participate in statewide JLUS coordination: • Convene a yearly forum of *Joining Forces* military and community stakeholders to communicate updates in missions and operational activities, identify common interests and available resources, and jointly pursue legislative and funding opportunities • Participate in statewide JLUS coordination efforts • Address the security and safety risks associated with increasing hobbyist UAS activity near airfields or other secure facilities; • Create a region-wide forum for communication and advocacy for compatible development in communities surrounding military installations; • Promote an early notification and consultation process regarding siting of tall structures (e.g. energy and communications infrastructure); • Promote early outreach with energy developers and regulators during the project planning phase to shape compatible siting decisions; and • Actively pursue state legislation that enables local governments to implement targeted land use controls on unincorporated land.	**Lead**: NCTCOG **Supporting**: Military Installations, City and County Governments, Texas Military Department, Texas Military Preparedness Commission	*Joining Forces* region	High	Short

Strategy	Partners	Area	Priority	Time Frame
Coordinate on the use of UAS by local governments for law enforcement purposes or UAS-related business development to ensure safe public and commercial operations near aviation and military training activities: • Collaborate with military installations to identify any specific training and operational areas that are vulnerable to safety and security threats from unauthorized UAS activity	**Lead**: NCTCOG **Supporting**: Military Installations, FAA, Regional Airports, City and County Governments	Airfield clearance zones; drop zones; low-level approach and departure paths; and/or specified distance from airfield and range training areas	Medium	Short
Energy Infrastructure				
Establish guidelines to promote an early notification and consultation process in which local governments provide regular updates on the siting of energy and communications infrastructure near military installations and aviation training areas within their jurisdictions • Promote compliance with ERCOT Declaration of Department of Defense Notification for proposed generating sources	**Lead**: NCTCOG, City and County Governments **Supporting**: Military Installations, ERCOT, TMPC, Texas A&M	SUAs, MOAs, MTRs, airfield clearance zones; drop zones; low-level approach and departure paths	High	Short
Through coordination with installations, the Texas Commanders Council, and Texas Military Preparedness Commission, conduct early outreach with energy developers and regulators during the project planning phase to increase awareness of potential compatibility challenges, and offer technical guidance and resources to develop appropriate mitigation and alternate siting strategies that reduce the impacts of energy infrastructure on military operations	**Lead**: City and County Governments **Supporting**: NCTCOG, Military Installations, Texas Military Department, TCC, TMPC, Public Utility Commission of Texas, ERCOT	SUAs, MOAs, MTRs, airfield clearance zones; drop zones; low-level approach and departure paths	High	Short

Strategy	Partners	Area	Priority	Time Frame
Create and maintain an accessible regional spatial database to track major physical obstructions and flight hazards, including utility-scale wind and solar infrastructure, transmission lines, gas wells, and communication towers: • Produce maps to highlight the overlap of major infrastructure with key military aviation training areas • Use available spatial data to assist in identifying areas where the siting of infrastructure is at risk of contributing to radar interference, aviation hazards, or other incompatibilities with military operations	**Lead**: NCTCOG **Supporting**: Military Installations, City and County Governments, FAA	SUAs, MOAs, MTRs, airfield clearance zones; drop zones; low-level approach and departure paths	Medium	Mid
Strengthen the existing DoD Siting Clearinghouse process and advocate for additional federal guidance to assist in developing compatible energy projects: • Encourage energy generation and transmission developers to obtain a Military Impact Statement from the installation or Site Clearinghouse on proposed energy, and/or transmission projects, that are near installations, military flight paths, or may interfere with air traffic control and onboard aircraft radar systems and low-level flights • Encourage the DoD to send proposed energy projects to major military commands and the local installations for early review and that project evaluation integrates existing local government planning processes	**Lead**: Military Installations **Supporting**: City and County Governments, Texas Military Department	SUAs, MOAs, MTRs, airfield clearance zones; drop zones; low-level approach and departure paths	Medium	Mid
Land Use				
Develop a toolbox of land use, development, and infrastructure regulatory options available under current State of Texas law to assist county governments in maximizing their ability to shape compatible development patterns in unincorporated areas near military operations	**Lead**: NCTCOG **Supporting**: County Governments	SUAs, MOAs, MTRs, airfield clearance zones; drop zones; low-level approach and departure paths	Medium	Mid

Strategy	Partners	Area	Priority	Time Frame
Noise Management/Avoidance				
Create an internally coordinated noise complaint management process across DoD services in the *Joining Forces* region to field and document noise complaints: • Share analysis of complaints received with local governments to highlight patterns of noise exposure and areas of sensitivity, and identify opportunities to enhance public outreach and develop appropriate noise mitigation strategies	**Lead**: NAS Fort Worth JRB **Supporting**: Fort Wolters, Camp Maxey, RTAHP, City and County Governments	*Joining Forces* region	Medium	Mid
Statewide Policy/Legislative Actions				
Actively pursue state legislation that enables local governments to implement targeted land use controls on unincorporated land in specified proximity to military installations and training areas: • Meet with administrative staff of area legislators and discuss the sponsorship and drafting of proposed legislation to mitigate the impact of incompatible development and practices on military operations • Prepare to provide expert testimony during Legislative Session	**Lead**: Military Installations, TCC, NCTCOG **Supporting**: City and County Governments	*Joining Forces* region	High	Short

Strategy	Partners	Area	Priority	Time Frame
Actively pursue state legislation to establish a formal process of consultation under which communities notify and seek comment from an installation for a proposed ordinance, rule, plan, or structure that could affect an installation or military training activities: • Meet with administrative staff of area legislators and discuss the sponsorship and drafting of proposed legislation to mitigate the impact of incompatible development and practices on military operations • Prepare to provide expert testimony during Legislative Session	**Lead**: Military Installations, TCC, NCTCOG **Supporting**: City and County Governments	*Joining Forces* region	Medium	Mid
Actively pursue state legislation to create an early notification process to coordinate on the siting of major energy infrastructure projects, such as utility-scale wind and solar farms, transmission lines, and gas wells: • Meet with administrative staff of area legislators and discuss the sponsorship and drafting of proposed legislation to mitigate the impact of incompatible development and practices on military operations • Prepare to provide expert testimony during Legislative Session • Monitor proposed legislation that encourages alternative energy development; collect data to coordinate efforts to prevent siting and development of wind energy facilities near military training areas • Build on data gathering and planning activities of the ERCOT to facilitate statewide coordination between energy developers, regulators and military installations	**Lead**: Military Installations, TCC, NCTCOG **Supporting**: City and County Governments, ERCOT	*Joining Forces* region	Medium	Mid

Strategy	Partners	Area	Priority	Time Frame
Actively pursue strategic infrastructure or other physical investments to support increased installation capabilities in the *Joining Forces* region • Explore opportunities to access funding through the Defense Economic Adjustment Assistance Grant Program and the Texas Military Value Revolving Loan Fund	**Lead**: Military Installations, TCC, NCTCOG **Supporting**: City and County Governments, Texas Military Department, TMPC	*Joining Forces* region	Medium	Mid

Abbreviations:

DoD – Department of Defense

ERCOT - Electric Reliability Council of Texas

FAA – Federal Aviation Administration

JRB – Joint Reserve Base

MOAs - Military Operating Areas

MTRs - Military Training Routes

NAAQS - National Ambient Air Quality Standards

NAS – Naval Air Station

NCTCOG – North Central Texas Council of Governments

RCC - Regional Coordination Committee

RTAHP – Redmond Taylor Army Heliport

TCC - Texas Commander's Council

TMPC - Texas Military Preparedness Commission

UAS - Unmanned Aircraft Systems

Time Frame:

Short 1 to 2 years

Mid 3 to 5 years

Long 5+ years

Compatibility Strategy Menu – Fort Wolters and Communities

The table describes the recommended strategies for Fort Wolters and civilian organizations to continue enhancing compatibility of land uses around Fort Wolters, as well as recommendations for strengthening cooperation on a range of issues. These actions respond to issues and opportunities (listed below) identified by elected officials, Department of Defense (DoD) staff, and other community stakeholders. The menus organize strategies with the highest priority and shorter-term actions at the top of each category followed by less critical and longer-term measures. Partners should revisit the menu to adapt strategies in response to local conditions, available resources, and changing needs and priorities.

Issues/Opportunities:

- Drones/unmanned aircraft systems (UAS) can create physical hazards, such as midair strikes with aircraft, or pose security and safety threats to military installations **(Aviation and Airspace Safety**)
- There are no formal channels of communication and coordination between Fort Wolters and surrounding communities and a desire for increased military-civilian outreach and coordination (**Communication and Coordination**)
- State, federal, and local entities manage significant land and water resources near *Joining Forces* installations. Changes in ownership or use of resources potentially could alter known compatibility impacts on military operations (**Communication and Coordination**)
- Less utilized facilities in the region offer opportunities for better coordination and sharing of military resources among installations. Communities around Fort Wolters indicated a desire to accommodate expanded military and defense-related operations and economic activity (**Economic Development**)
- Energy-related infrastructure, including utility-scale wind and solar, transmission lines, and gas wells can create aviation hazards near military airfields and MTRs and interfere with air traffic control and onboard aircraft radar systems (**Energy Infrastructure**)
- The presence of rural lands, working farms, and sensitive environmental resources near Fort Wolters offers opportunities to establish conservation partnerships and create natural buffers around military operations (**Environmental/Cultural Resources**)

- Military training, including the use of vehicles, equipment, and ordnance, can contribute to a higher risk of wildfires and resulting safety threats to life and property (**Fire Management**)
- The presence of parks, lakes, detention ponds, sanitary landfills, or certain crops near airfields can attract birds and increase the risk of bird/aircraft strikes (**Land Use**)
- Local government plans set a policy framework for detailed compatibility actions. Some local government comprehensive or strategic planning studies, particularly older documents, lack specific language on compatibility with military installations (**Local Government Plans**)
- Changes in missions or aircraft operational levels or mix can produce new noise, safety, or other impacts on surrounding areas (**Military Plans/Operations**)
- Installations in the region host significant training activity by visiting military units. A lack of familiarity with nearby areas off the installation may contribute to increased noise or safety exposure during training (**Military Plans/Operations**)
- The presence of scattered, unexploded ordnance in areas around Fort Wolters can create a safety risk in surrounding communities (**Military Plans/Operations**)
- Sound attenuation construction practices and energy efficient design can reduce indoor noise exposure from nearby military training activity (**Noise Management/Avoidance**)
- Military installations in the region currently implement a range of avoidance and mitigation strategies to reduce aircraft noise exposure in surrounding areas (**Noise Management/Avoidance**)
- Light pollution and glare from lighting applications and digital billboards can interfere with pilot vision and the use of night-vision training devices (**Outdoor Lighting/Signs**)
- Adjoining recreational amenities increase the risk of trespass onto military lands (**Physical Security**)
- Deficiencies in condition and/or capacity in the transportation network surrounding installations can affect the movement of military personnel or equipment and increase safety risks for all users (**Transportation**)

Summary of High Priority and Short Term Actions – Fort Wolters and Communities

Category	Strategy
Airspace	Identify specific off-installation aviation and range training areas vulnerable to security and safety threats from UAS activity
Communication and Coordination	Continue briefings with regional partners to build support and strengthen engagement in ongoing *Joining Forces* compatibility activities
Communication and Coordination	Create formal, ongoing channels of communication and coordination between Fort Wolters and local communities to exchange information on major community actions and military operations that have potential compatibility impacts
Communication and Coordination	Develop outreach materials to include information on mission, economic impact, and clear points of contact at Fort Wolters, as well as a map highlighting general operational impacts such as noise in surrounding communities
Communication and Coordination	Establish a formal coordination process with the entities that manage Lake Mineral Wells State Park to ensure that ongoing operations, management actions, and plans consider environmental and security impacts on Fort Wolters operations
Communication and Coordination	Support implementation of Texas House Bill (HB) 890 by ensuring the ready availability of compatibility-related studies, such as the most recent AICUZ and/or Joint Land Use Study (JLUS)[1]
Economic Development	Identify strategic investments, such as improvements in infrastructure to support a potential increase in installation capabilities at Fort Wolters and/or compatible re-use of the Fort Wolters Industrial Park:
Energy	Coordinate on the siting of energy infrastructure to reduce safety threats to aviation activity • Coordinate to ensure that Fort Wolters and Naval Air Station (NAS) Fort Worth Joint Reserve Base (JRB) receive updated mapping of the location of energy infrastructure
Land Use	Explore use of State of Texas authority to establish a Joint Airport Zone (JAZ) Board to prevent aviation related hazards around Fort Wolters
Military Plans	Collaborate with local communities to reinforce existing safety and reporting guidelines in the event of discovery of unexploded ordnance on off-installation land
Physical Security	Coordinate with Lake Mineral Wells State Park on security issues, and enhance outreach to recreational users on the safety risks associated with trespass onto Fort Wolters

[1] Effective 9/1/17, Texas State House and Senate have passed HB 890, which requires notice to purchasers of real property regarding the impact of military installations; cities and counties must provide access to the latest Air Installation Compatible Use Zone (AICUZ) or JLUS

Compatibility Strategies – Fort Wolters and Communities

Strategy	Partners	Area	Priority	Time Frame
Aviation and Airspace Safety				
Identify specific aviation and range training areas vulnerable to security and safety threats from UAS activity	**Lead**: Fort Wolters, NAS Fort Worth JRB **Supporting**: City of Mineral Wells, Palo Pinto County, Parker County, Local Airports	Airfield clearance zones; drop zones; low-level approach and departure paths; and/or specified distance from airfield and range training areas	High	Short
Communication and Coordination				
Continue briefings with regional partners to build support and strengthen engagement in ongoing *Joining Forces* compatibility implementation activities	**Lead**: NCTCOG **Supporting**: City and County Governments	Palo Pinto and Parker Counties and Municipalities	High	Short
Create formal, ongoing channels of communication and coordination between Fort Wolters and local communities to exchange information on major community actions and military operations that have potential compatibility impacts	**Lead**: Fort Wolters, City of Mineral Wells **Supporting**: NCTCOG, Texas Military Department, Parker County, Palo Pinto County	Palo Pinto and Parker Counties and Municipalities	High	Short
Develop outreach materials to include information on mission, economic impact, and clear points of contact at Fort Wolters, as well as map of general operational impacts such as noise in surrounding communities	**Lead**: Fort Wolters, Texas Military Department **Supporting**: NCTCOG, City of Mineral Wells, Palo Pinto County, Parker County	Palo Pinto and Parker Counties and Municipalities	High	Short

Strategy	Partners	Area	Priority	Time Frame
Establish a formal coordination process with the entities that manage Lake Mineral Wells State Park to ensure that ongoing operations, management actions, and plans consider environmental and security impacts on Fort Wolters operations	**Lead**: Fort Wolters, Texas Military Department **Supporting**: USACE, Texas Parks and Wildlife Department	Areas of Fort Wolters with adjacency to Lake Mineral Wells State Park	High	Short
Support implementation of HB 890 by ensuring the ready availability of compatibility-related studies, such as the most recent AICUZ and/or JLUS	**Lead**: City of Mineral Wells, Palo Pinto County, Parker County **Supporting**: Fort Wolters, NCTCOG, Texas Military Department	Palo Pinto and Parker Counties and Municipalities	High	Short
Conduct at least an annual briefing in partner communities to increase awareness of missions, training schedules and special exercises, and any foreseeable operational changes or training workload	**Lead**: Fort Wolters, Texas Military Department	Palo Pinto and Parker Counties and Municipalities	Medium	Mid
Conduct on-installation visits, "field trips," and open houses on an annual basis to increase awareness of the military mission among the public, key stakeholders, and representatives of *Joining Forces* partner entities	**Lead**: Fort Wolters, Texas Military Department	Palo Pinto and Parker Counties and Municipalities	Medium	Mid
Invite military representatives to sit as non-voting members of city and county advisory bodies and commissions	**Lead**: City of Mineral Wells, Palo Pinto County, Parker County **Supporting**: Fort Wolters	Palo Pinto and Parker Counties and Municipalities	Low	Mid

Strategy	Partners	Area	Priority	Time Frame
Prepare and distribute a "welcome packet" with information on base background, mission, and operations for incoming residents to promote an understanding of operations and potential impacts	**Lead**: Fort Wolters, Texas Military Department **Supporting**: City of Mineral Wells, Palo Pinto County, Parker County	Areas with adjacency to range and airfield: airfield clearance zones; drop zones; low-level approach and departure paths; Surface Danger Zone; and/or specified distance from installation boundary	Low	Long
Economic Development				
Identify strategic investments, such as improvements in infrastructure to support a potential increase in installation capabilities at Fort Wolters and/or compatible re-use of the Fort Wolters Industrial Park: • Encourage partnerships between military representatives and local economic development organizations, such as the Chamber of Commerce, to identify complementary defense-related spin-off private sector industries that can be recruited to the community • Conduct a follow up study to determine the feasible and compatible use of Fort Wolters Industrial Park facilities • Capitalize on resources at Mineral Wells Airport as an asset for military aviation training	**Lead**: City of Mineral Wells **Supporting**: Fort Wolters, Texas Military Department, Mineral Wells Area Chamber of Commerce, NAS Fort Worth JRB	City of Mineral Wells	High	Mid

Strategy	Partners	Area	Priority	Time Frame
Energy Infrastructure				
Coordinate on the siting of energy infrastructure to reduce safety threats to aviation activity • Coordinate to ensure that Fort Wolters and NAS Fort Worth JRB receive updated mapping of the location of energy infrastructure	**Lead**: City of Mineral Wells, Palo Pinto County, Parker County **Supporting**: Fort Wolters, Texas Military Department, NAS Forth Worth JRB	Airfield clearance zones; drop zones; low-level approach and departure paths; and/or specified distance from airfield and range training areas	High	Short
Establish a formal local permitting/siting process for proposed energy projects that explicitly considers vertical intrusion, radar interference, visual distraction, or other potential impacts on military training and operations	**Lead**: City of Mineral Wells, Palo Pinto County, Parker County **Supporting**: NCTCOG, Fort Wolters, Texas Military Department, NAS Forth Worth JRB	Airfield clearance zones; drop zones; low-level approach and departure paths; and/or specified distance from airfield and range training areas	Medium	Mid

Strategy	Partners	Area	Priority	Time Frame
Environmental/Cultural Resources				
Collaborate with conservation partners, non-profit groups, and research entities to identify areas with an overlap of military impact (e.g. noise or safety risk) and natural/working lands/cultural value that thus may be candidates for easement or fee-simple purchases through the Readiness and Environmental Protection Initiative (REPI)/Army Compatible Use Buffer (ACUB), and the Sentinel Landscapes Partnership • Establish a regional partnership or partner with land trusts or research entities to conduct analyses of landscapes and working lands and identify appropriate management strategies, including potential management partnerships with willing landowners • Increase landowner awareness of available programs, such as easements, tax incentives, beginning farmer and rancher grant and loan programs, and local food systems, that support the economic viability and continued operation of existing farms and ranches	**Lead**: Fort Wolters, Texas Military Department **Supporting**: Natural Resources Conservation Service, Texas A&M University, Texas A&M AgriLife Extension Service; U.S. Fish & Wildlife Service, DoD	Conservation lands as identified near Fort Wolters	Medium	Mid
Fire Management				
Build on ongoing partnerships to coordinate fire prevention and suppression strategies, including the implementation of fire breaks near training lands to reduce the risk of the spread of wildfires onto or off of the installation	**Lead**: Fort Wolters **Supporting**: Texas Forest Service, Natural Resources Conservation Service; U.S. Fish & Wildlife Service	Areas with adjacency to Fort Wolters range training operations	Medium	Mid

Strategy	Partners	Area	Priority	Time Frame
Land Use				
Explore use of State of Texas authority to establish a JAZ Board to prevent aviation-related hazards around Fort Wolters	**Lead**: City of Mineral Wells, Palo Pinto County, Parker County **Supporting**: Fort Wolters, Texas Military Department, NAS Forth Worth JRB	Airfield clearance zones; drop zones; low-level approach and departure paths; and/or specified distance from airfield	High	Short
Work with Fort Wolters to develop a voluntary memorandum of agreement that establishes an area of joint consultation related to changes in military operations and proposed local ordinances, rules, plans, or structures that could create compatibility issues	**Lead**: City of Mineral Wells, Palo Pinto County, Parker County, Fort Wolters **Supporting**: Texas Military Department, NCTCOG	Airfield clearance zones; drop zones; low-level approach and departure paths; and/or specified distance from airfield	Medium	Mid
Reduce bird attraction by 1) establishing siting and design standards for uses, such as detention ponds, sanitary landfills, and crops in areas subject to low-level flights, and 2) coordinating on Bird/Animal Aircraft Strike Hazard (BASH) measures with resource management entities	**Lead**: City of Mineral Wells, Palo Pinto County, Parker County **Supporting**: Fort Wolters, Texas Military Department, NAS Forth Worth JRB, Texas Parks and Wildlife Department	Airfield clearance zones; drop zones; low-level approach and departure paths; and/or specified distance from airfield	Medium	Mid

Strategy	Partners	Area	Priority	Time Frame
Use capital improvement planning and infrastructure system requirements to shape growth patterns and promote less dense, compatible development in areas exposed to military operational impacts, such as noise and safety risks	**Lead**: City of Mineral Wells **Supporting**: Palo Pinto County, Parker County	Areas with adjacency to range and airfield: airfield clearance zones; drop zones; low-level approach and departure paths; Surface Danger Zone; and/or specified distance from installation boundary	Low	Long
Local Government Plans				
Invite military and other *Joining Forces* partners to participate in local planning and development advisory bodies and major plan updates and amendments, including Comprehensive Plans; neighborhood or corridor plans in areas of sensitivity; and transportation, infrastructure, and natural resource plans	**Lead**: City of Mineral Wells, Palo Pinto County, Parker County **Supporting**: Fort Wolters, Texas Military Department	Palo Pinto and Parker Counties and Municipalities	Medium	Mid
Incorporate compatibility in future Comprehensive Plans; sector, neighborhood and corridor plans; and other policy documents, including references to compatibility with Fort Wolters operations, maps, and recommendations identified in the JLUS	**Lead**: City of Mineral Wells, Palo Pinto County, Parker County **Supporting**: Fort Wolters, Texas Military Department	Palo Pinto and Parker Counties and Municipalities	Low	Long

Strategy	Partners	Area	Priority	Time Frame
Military Plans/Operations				
Collaborate with local communities to reinforce existing safety and reporting guidelines in the event of discovery of unexploded ordnance on off-installation land	**Lead**: Fort Wolters, Texas Military Department **Supporting**: City of Mineral Wells, Palo Pinto County, Parker County	Areas that are the site of former training operations and demonstrate risk of unexploded ordnance based on USACE survey	High	Short
Conduct briefings of visiting military units to increase an understanding of training impacts, such as noise or military vehicle convoys on surrounding areas and promote compliance with existing mitigation procedures	**Lead**: Fort Wolters **Supporting**: Texas Military Department	Areas with adjacency to Fort Wolters range training and aviation operations	Medium	Short
Conduct additional analysis as necessary to reflect potentially significant changes in noise, safety, or other operational impacts associated with new military missions or aircraft	**Lead**: Fort Wolters, Texas Military Department, NAS Forth Worth JRB **Supporting**: City of Mineral Wells, Palo Pinto County, Parker County	Affected environment as determined by analysis	Low	Long

Strategy	Partners	Area	Priority	Time Frame
Noise Management/Avoidance				
Continue managing off-installation aviation noise impacts through feasible operational or timing adjustments that will not negatively affect training or readiness to reduce noise exposure on local communities and sensitive locations	**Lead**: Fort Wolters, NAS Fort Worth JRB **Supporting:** Texas Military Department	Areas exposed to operational noise, including areas in proximity to the airfield, range and drop zones	Medium	Mid
Adopt sound attenuation building standards and/or energy efficiency practices to achieve indoor noise reduction in the construction of sensitive receptors, such as housing, schools, or medical facilities within noise zones associated with range and airfield operations	**Lead**: City of Mineral Wells, Palo Pinto County, Parker County **Supporting:** NCTCOG	Areas exposed to operational noise, including areas near the airfield, range and drop zones	Low	Long
Connect homeowners and other noise sensitive receptors to available resources, such as weatherization and energy efficiency programs that offer guidance and incentives for the energy efficient retrofitting of structures	**Lead**: City of Mineral Wells, Palo Pinto County, Parker County **Supporting**: NCTCOG, Texas State Energy Conservation Office	Areas exposed to operational noise, including areas in proximity to the airfield, range and drop zones	Low	Long

Strategy	Partners	Area	Priority	Time Frame
Outdoor Lighting/Signs				
Explore dark-sky provisions that require or promote the use of fully shielded, cut-off outdoor lighting applications for major new developments (e.g. commercial, industrial uses, airports and airfields, outdoor sports stadiums) near military airfields	**Lead**: City of Mineral Wells, Palo Pinto County, Parker County **Supporting**: Fort Wolters, Texas Military Department, NAS Fort Worth JRB	Airfield clearance zones; drop zones; low-level approach and departure path	Medium	Mid
Coordinate with Fort Wolters on the siting and design of digital billboards in airfield flight paths to reduce visual distraction of pilots	**Lead**: City of Mineral Wells, Palo Pinto County, Parker County **Supporting**: Fort Wolters, Texas Military Department, NAS Fort Worth JRB	Airfield clearance zones; drop zones; low-level approach and departure path	Low	Short
Encourage the retrofitting of older, large-scale unshielded lighting applications (e.g. big-box commercial, major industrial uses, airports and airfields, outdoor sports stadiums) through an outreach campaign and use of energy efficiency incentives	**Lead**: City of Mineral Wells, Palo Pinto County, Parker County **Supporting**: Fort Wolters, Texas Military Department, NAS Fort Worth JRB	Airfield clearance zones; drop zones; low-level approach and departure path	Low	Long
Physical Security				
Coordinate with Lake Mineral Wells State Park on security issues, and enhance outreach to recreational users on the safety risks associated with trespass onto Fort Wolters	**Lead**: Fort Wolters, Texas Military Department **Supporting**: Texas Parks and Wildlife Department	Areas of Fort Wolters with adjacency to public lands	High	Short

Strategy	Partners	Area	Priority	Time Frame
Explore opportunities to enhance installation perimeter security and entry control points at Fort Wolters • Conduct community outreach on the safety and security risks associated with trespass onto Fort Wolters	**Lead**: Fort Wolters, Texas Military Department **Supporting**: City of Mineral Wells, Palo Pinto County, Parker County	Areas of Fort Wolters with adjacency to public lands or public access points	Medium	Mid
Transportation				
Identify any strategic upgrades or improved maintenance necessary to ensure the safety and adequacy of the supporting road network surrounding Fort Wolters	**Lead**: NCTCOG, TxDOT **Supporting**: Fort Wolters, City of Mineral Wells, Palo Pinto County, Parker County	Areas of Fort Wolters with adjacency to public lands or public access points	Low	Long

Abbreviations:

ACUB - Army Compatible Use Buffer
AICUZ – Air Installation Compatible Use Zone
BASH - Bird/Animal Aircraft Strike Hazard
DoD – Department of Defense
FAA – Federal Aviation Administration
FCC – Federal Communications Commission
HB – House Bill
JAZ - Joint Airport Zone
JLUS – Joint Land Use Study
JRB – Joint Reserve Base
MOAs - Military Operating Areas
MTRs - Military Training Routes
NAS – Naval Air Station
NCTCOG – North Central Texas Council of Governments
RCC - Regional Coordination Committee
REPI - Readiness and Environmental Protection Initiative
TCC - Texas Commander's Council
TxDOT - Texas Department of Transportation
UAS - Unmanned Aircraft Systems
USACE – U.S. Army Corps of Engineers

Time Frame:

Short 1 to 2 years
Mid 3 to 5 years
Long 5+ years

Compatibility Strategy Menu – Camp Maxey and Communities

The table describes the recommended strategies for Camp Maxey and civilian organizations to continue enhancing compatibility of land uses around Camp Maxey, as well as recommendations for strengthening cooperation on a range of issues. These actions respond to issues and opportunities (listed below) identified by elected officials, Department of Defense (DoD) staff, and other community stakeholders. The menus organize strategies with the highest priority and shorter-term actions at the top of each category followed by less critical and longer-term measures. Partners should revisit the menu to adapt strategies in response to local conditions, available resources, and changing needs and priorities.

Issues/Opportunities:

- Drones/unmanned aircraft systems (UAS) can create physical hazards, such as midair strikes with aircraft, or pose security and safety threats to military installations **(Aviation and Airspace Safety**)
- Civilian aircraft regularly fly over the eastern portion of the installation, creating potential conflicts with firing range activities **(Aviation and Airspace Safety)**
- There are no formal channels of communication and coordination between Camp Maxey and surrounding communities, and there is a desire for increased military-civilian outreach and coordination (**Communication and Coordination**)
- State, federal, and local entities manage significant land and water resources near *Joining Forces* installations. Changes in ownership or use of resources could potentially alter known compatibility impacts on military operations (**Communication and Coordination**)
- Less utilized facilities in the region offer opportunities for better coordination and sharing of military resources across installation boundaries. Communities around Camp Maxey indicated a desire to accommodate expanded military and defense-related operations and economic activity (**Economic Development**)
- Energy-related infrastructure, including utility-scale wind and solar, transmission lines, and gas wells, can create aviation hazards near military airfields and Military Training Routes (MTRs) and interfere with air traffic control and onboard aircraft radar systems (**Energy Infrastructure**)
- The presence of rural lands, working farms, and sensitive environmental resources near Camp Maxey offers opportunities to establish conservation partnerships and create natural buffers around military operations (**Environmental/Cultural Resources**)

- Military training, including the use of vehicles, equipment, and ordnance, can contribute to a higher risk of wildfires and resulting safety threats to life and property (**Fire Management**)
- The presence of parks, lakes, detention ponds, sanitary landfills, or certain crops near airfields can attract birds and increase the risk of bird/aircraft strikes (**Land Use**)
- Local government plans set a policy framework for detailed compatibility actions. Some local government comprehensive or strategic planning studies, particularly older documents, lack specific language on compatibility with military installations (**Local Government Plans**)
- Changes in missions or aircraft operational levels or mix can produce new noise, safety, or other impacts on surrounding areas (**Military Plans/Operations**)
- Installations in the region host significant training activity by visiting military units. A lack of familiarity with nearby areas off the installation may contribute to increased noise or safety exposure during training (**Military Plans/Operations**)
- Sound attenuation construction practices and energy efficient design can reduce indoor noise exposure from nearby military training activity (**Noise Management/Avoidance**)
- Military installations in the region currently implement a range of avoidance and mitigation strategies to reduce aircraft noise exposure in surrounding areas (**Noise Management/Avoidance**)
- Light pollution and glare from lighting applications and digital billboards can interfere with pilot vision and the use of night-vision training devices (**Outdoor Lighting/Signs)**
- Hunters entering from adjacent recreational lands regularly trespass onto Camp Maxey lands, presenting a danger to themselves, as well as Soldiers in the training areas (**Physical Security**)
- Multiple entities use an on-base road built for the City of Paris' use, creating potential conflicts with training activities **(Physical Security)**
- Deficiencies in condition and/or capacity in the transportation network surrounding installations can affect the movement of military personnel or equipment and increase safety risks for all users (**Transportation**)
- Lack of signs can make the installation difficult to locate for visiting Guard members; in addition, better signs would alert the general public to the existence of Camp Maxey (**Transportation)**
- Traffic associated with the mulch plant near Camp Maxey's main gate has increased substantially, creating conflicts with gate traffic **(Transportation)**

Summary of High Priority and Short Term Actions – Camp Maxey and Communities

Category	Strategy
Airspace	Identify specific aviation and range training areas vulnerable to security and safety threats from unauthorized UAS activity
Airspace	Work with local airports, and conduct outreach to the general aviation community to communicate safety risks to low-flying aircraft during active range operations and prevent unauthorized overflight near Camp Maxey
Communication and Coordination	Create formal, ongoing channels of communication and coordination between Camp Maxey and local communities to exchange information on major community actions and military operations that have potential compatibility impacts
Communication and Coordination	Develop outreach materials to include information and a map highlighting mission, economic impact, potential operational or safety issues in surrounding communities, and clear points of contact at Camp Maxey
Communication and Coordination	Establish a formal coordination process with the entities that manage Pat Mayse Lake reservoir and Wildlife Management Area to ensure that ongoing operations, management actions, and plans consider environmental and security impacts on Camp Maxey operations
Communication and Coordination	Support implementation of Texas House Bill (HB) 890 by ensuring the ready availability of compatibility-related studies, such as the most recent Air Installation Compatible Use Zone (AICUZ) and/or Joint Land Use Study (JLUS)[1]
Energy	Coordinate on the siting of energy infrastructure to reduce safety threats to aviation activity • Coordinate to ensure that Camp Maxey receives updated mapping of the location of energy infrastructure
Land Use	Coordinate with the State Legislature and Lamar County representatives to establish the legal authority to implement land use controls that promote compatibility on unincorporated lands near critical Camp Maxey operations
Physical Security	Coordinate with Pat Mayse Lake reservoir and Wildlife Management Area on security issues and enhance outreach to recreational users on the safety risks associated with trespass onto Camp Maxey

[1] Effective 9/1/17, Texas State House and Senate have passed HB 890, requires notice to purchasers of real property regarding the impact of military installations; cities and counties must provide access to the latest AICUZ or JLUS

Category	Strategy
Physical Security	Work with the USACE to explore strategies to reduce the risk of trespass by: • Moving the Camp Maxey boundary north to the lake, thus eliminating hunting at the northern installation boundary and helping to improve anti-trespass enforcement; OR • Banning hunting (and restricting other access) to the area between Camp Maxey and the lake
Physical Security	Coordinate maintenance of city road on Camp Maxey and regulate use to reduce potential trespass and safety conflicts with training operations

Revised Compatibility Strategies – Camp Maxey and Communities

Strategy	Partners	Area	Priority	Timeframe
Aviation and Airspace Safety				
Identify specific aviation and range training areas vulnerable to security and safety threats from unauthorized UAS activity	**Lead**: Camp Maxey **Supporting**: City of Paris, Lamar County, Local Airports	Airfield clearance zones; drop zones; low-level approach and departure paths; and/or specified distance from airfield and range training areas	High	Short
Work with local airports and conduct outreach to the general aviation community to communicate safety risks to low-flying aircraft during active range operations and prevent unauthorized overflight near Camp Maxey	**Lead**: Camp Maxey **Supporting**: City of Paris, Lamar County, FAA, NCTCOG, Local Airports, General Aviation Organizations	Lamar County and Municipalities	High	Short
Communication and Coordination				
Create formal, ongoing channels of communication and coordination between Camp Maxey and local communities to exchange information on major community actions and military operations that have potential compatibility impacts	**Lead**: Camp Maxey, City of Paris, Lamar County **Supporting**: Texas Military Department, Red River Veterans Authority, Ark-Tex Council of Governments (COG)	Lamar County and Municipalities	High	Short
Develop outreach materials to include information and a map highlighting mission, economic impact, potential operational or safety issues in surrounding communities, and clear points of contact at Camp Maxey	**Lead**: Camp Maxey **Supporting**: Texas Military Department, Red River Veterans Authority, City of Paris, Lamar County	Lamar County and Municipalities	High	Short

Strategy	Partners	Area	Priority	Timeframe
Establish a formal coordination process with the entities that manage Pat Mayse Lake reservoir and Wildlife Management Area to ensure that ongoing operations, management actions, and plans consider environmental and security impacts on Camp Maxey operations	**Lead**: Camp Maxey, Texas Military Department **Supporting**: USACE, Texas Parks and Wildlife Department	Areas of Camp Maxey with adjacency to Pat Mayse Lake reservoir and Wildlife Management Area	High	Short
Support implementation of Texas HB 890 by ensuring the ready availability of compatibility-related studies, such as the most recent AICUZ and/or JLUS	**Lead**: City of Paris, Lamar County **Supporting**: RTAHP, NCTCOG, Ark-Tex COG	Lamar County and Municipalities	High	Short
Conduct at least an annual briefing in partner communities to increase awareness of missions, training schedules and special exercises, and any foreseeable operational changes or training workload	**Lead**: Camp Maxey **Supporting**: Texas Military Department, Red River Veterans Authority	Lamar County and Municipalities	Medium	Mid
Conduct on-installation visits, "field trips," and open houses on an annual basis to increase awareness of the military mission among the public, key stakeholders, and representatives of *Joining Forces* partner entities	**Lead**: Camp Maxey **Supporting**: Texas Military Department, Red River Veterans Authority	Lamar County and Municipalities	Medium	Mid
Invite military representatives to sit as non-voting members of city and county advisory bodies and commissions	**Lead**: City of Paris, Lamar County **Supporting**: Camp Maxey, Texas Military Department	Lamar County and Municipalities	Medium	Mid

Strategy	Partners	Area	Priority	Timeframe
Prepare and distribute a "welcome packet" with information on base background, mission, and operations for incoming residents to promote an understanding of operations and potential impacts	**Lead**: Camp Maxey, Texas Military Department **Supporting**: City of Paris, Lamar County	Areas with adjacency to range and airfield: airfield clearance zones; drop zones; low-level approach and departure paths; Surface Danger Zone; and/or specified distance from installation boundary	Low	Long
Economic Development				
Identify strategic investments, such as improvements in surrounding infrastructure to support a potential increase in installation capabilities at Camp Maxey: • Encourage partnerships between military representatives and local economic development organizations, such as the Chamber of Commerce, to identify complementary defense-related spin-off private sector industries that can be recruited to the community	**Lead**: City of Paris **Supporting**: Camp Maxey, Texas Military Department, Paris Chamber of Commerce and other nearby Chambers; Paris Economic Development Corporation	City of Paris	Medium	Mid

Strategy	Partners	Area	Priority	Time Frame
Energy Infrastructure				
Coordinate on the siting of energy infrastructure to reduce safety threats to aviation activity • Coordinate to ensure that Camp Maxey receives updated mapping of the location of energy infrastructure	**Lead**: City of Paris, Lamar County **Supporting**: Camp Maxey, Texas Military Department, Cox Field	Airfield clearance zones; drop zones; low-level approach and departure paths; and/or specified distance from airfield and range training areas	High	Short
Establish a formal local permitting/siting process for proposed energy projects that explicitly considers vertical intrusion, radar interference, visual distraction, or other potential impacts on military training and operations	**Lead**: Lamar County **Supporting**: Camp Maxey, Texas Military Department	Airfield clearance zones; drop zones; low-level approach and departure paths; and/or specified distance from airfield and range training areas	Medium	Mid

Strategy	Partners	Area	Priority	Time Frame
Environmental/Cultural Resources				
Drawing from City of Paris' Evaluation of all Natural and Man-Made Resources, collaborate with conservation partners, non-profit groups, and research entities to identify areas with an overlap of military impact (e.g. noise or safety risk) and natural/working /cultural value that thus may be candidates for easement or fee-simple purchases through the Readiness and Environmental Protection Initiative (REPI)/Army Compatible Use Buffer (ACUB), and Sentinel Landscapes Partnership • Establish a regional partnership or partner with land trusts or research entities to conduct analysis of landscapes and working lands and identify appropriate management strategies, including potential management partnerships with willing landowners • Increase landowner awareness of available programs, such as easements, tax incentives, beginning farmer and rancher grant and loan programs, local food systems, that support the economic viability and continued operation of existing farms and ranches	**Lead**: Camp Maxey, Texas Military Department **Supporting**: Natural Resources Conservation Service, Texas A&M University, Texas A&M AgriLife Extension Service; U.S. Fish & Wildlife Service, DoD	Conservation lands as identified near Camp Maxey	Low	Long
Fire Management				
Build on ongoing partnerships to coordinate on fire prevention and suppression strategies, including the implementation of fire breaks near training lands to reduce the risk of the spread of wildfires onto or off of the installation	**Lead**: Camp Maxey **Supporting**: Texas Forest Service, Natural Resources Conservation Service; City of Paris, Lamar County	Areas with adjacency to Camp Maxey range training operations	Medium	Mid

Strategy	Partners	Area	Priority	Time Frame
Land Use				
Coordinate with the State Legislature and Lamar County representatives to establish the legal authority to implement land use controls that promote compatibility on unincorporated lands near critical Camp Maxey operations	**Lead**: City of Paris, Lamar County **Supporting**: Camp Maxey, Texas Military Department, NCTCOG	Areas with adjacency to range and airfield: airfield clearance zones; drop zones; low-level approach and departure paths; Surface Danger Zone; and/or specified distance from installation boundary	High	Low
Work with Camp Maxey to develop a voluntary memorandum of agreement that establishes an area of joint consultation related to changes in military operations and proposed local ordinances, rules, plans, or structures that could create compatibility issues	**Lead**: City of Paris, Lamar County, Camp Maxey **Supporting**: Texas Military Department, NCTCOG	Airfield clearance zones; drop zones; low-level approach and departure paths; and/or specified distance from airfield	High	Mid

Strategy	Partners	Area	Priority	Time Frame
Reduce bird attraction by 1) establishing siting and design standards for uses, such as detention ponds, sanitary landfills, and crops in areas subject to low-level flights and 2) coordinating on Bird/Animal Aircraft Strike Hazard (BASH) measures with resource management entities	**Lead**: City of Paris, Lamar County **Supporting**: Camp Maxey, Texas Military Department, U.S. Army Corps of Engineers, Texas Parks and Wildlife Department	Airfield clearance zones; drop zones; low-level approach and departure paths; and/or specified distance from airfield	High	Mid
Explore use State of Texas authority to establish a Joint Airport Zone (JAZ) Board to prevent aviation-related hazards around Camp Maxey	**Lead**: City of Paris, Lamar County **Supporting**: Camp Maxey, Texas Military Department	Airfield clearance zones; drop zones; low-level approach and departure paths; and/or specified distance from airfield	High	Mid

Strategy	Partners	Area	Priority	Time Frame
Use capital improvement planning and infrastructure system requirements to shape growth patterns and promote less dense, compatible development in areas exposed to military operational impacts, such as noise and safety risks	**Lead**: City of Paris **Supporting**: Lamar County	Areas with adjacency to range and airfield: airfield clearance zones; drop zones; low-level approach and departure paths; Surface Danger Zone; and/or specified distance from installation boundary	Medium	Long
Local Government Plans				
Coordinate with Pat Mayse Lake reservoir and Wildlife Management Area on security issues and enhance outreach to recreational users on the safety risks associated with trespass onto Camp Maxey	**Lead**: Camp Maxey, Texas Military Department **Supporting**: Texas Parks and Wildlife Department	Areas of Camp Maxey with adjacency to public lands	High	Short

Strategy	Partners	Area	Priority	Time Frame
Invite military and other *Joining Forces* partners to participate in local planning and development advisory bodies and major plan updates and amendments, including Comprehensive Plans, neighborhood or corridor plans in areas of sensitivity, and transportation, infrastructure, and natural resource plans	**Lead**: City of Paris, Lamar County **Supporting**: Camp Maxey, Texas Military Department	Lamar County and Municipalities	Medium	Mid
Incorporate compatibility in a future Comprehensive Plan, sector, neighborhood and corridor plans, and other policy documents, including references to compatibility with Camp Maxey operations, maps, and recommendations identified in the JLUS	**Lead**: City of Paris, Lamar County **Supporting**: Camp Maxey, Texas Military Department	Lamar County and Municipalities	Low	Long
Military Plans/Operations				
Conduct briefings of visiting military units to increase the understanding of training impacts, such as noise or military vehicle convoys, on surrounding areas and promote compliance with existing mitigation procedures	**Lead**: Camp Maxey **Supporting**: Texas Military Department	Areas with adjacency to Camp Maxey range training and aviation operations	Medium	Short

Strategy	Partners	Area	Priority	Time Frame
Explore opportunities to enhance installation perimeter security and entry control points at Camp Maxey • Conduct community outreach on the safety and security risks associated with trespass onto Camp Maxey	**Lead**: Camp Maxey, Texas Military Department **Supporting**: City of Paris, Lamar County	Areas of Camp Maxey with adjacency to public lands or public access points	Medium	Mid
Conduct additional environmental analysis as necessary to reflect potentially significant changes in noise, safety, or other operational impacts associated with new military missions or aircraft • Use Geographic Information System (GIS) department within the Change Center of Command to provide analysis of any environmental impact that is due to military operations	**Lead**: Camp Maxey, Texas Military Department **Supporting**: City of Paris, Lamar County	Affected environment as determined by analysis	Low	Long
Physical Security				
Coordinate maintenance of easement road on Camp Maxey and regulate use to reduce trespass and safety conflicts with training operations	**Lead**: Camp Maxey, City of Paris **Supporting**: Texas Military Department	Camp Maxey	High	Short
Work with the USACE to explore strategies to reduce the risk of trespass by: • Moving the Camp Maxey boundary north to the lake, thus eliminating hunting at the northern installation boundary and helping to improve anti-trespass enforcement; OR • Banning hunting (and restricting other access) to the area between Camp Maxey and the lake	**Lead**: Camp Maxey, Texas Military Department **Supporting**: USACE	Areas of Camp Maxey with adjacency to public lands	High	Short

Strategy	Partners	Area	Priority	Time Frame
Explore opportunities to enhance installation perimeter security and entry control points at Camp Maxey • Conduct community outreach on the safety and security risks associated with trespass onto Camp Maxey	**Lead**: Camp Maxey, Texas Military Department **Supporting**: City of Paris, Lamar County	Areas of Camp Maxey with adjacency to public lands or public access points	Medium	Mid
Transportation				
Add directional signs and "Military Entrance Ahead" signs to increase awareness of Camp Maxey, facilitate access, and reduce safety risks and conflicts during military convoys	**Lead**: TxDOT, Lamar County **Supporting**: Camp Maxey, Texas Military Department	Areas of Camp Maxey with adjacency to public access points	Medium	Short
Develop an access plan for Camp Maxey, including intersection improvements to manage commercial and installation traffic	**Lead**: TxDOT, Lamar County **Supporting**: Camp Maxey, Texas Military Department	Areas of Camp Maxey with adjacency to public access points	Medium	Mid
Identify any strategic upgrades or improved maintenance necessary to ensure the safety and adequacy of the supporting road network surrounding Camp Maxey	**Lead**: Ark-Tex Council of Governments, TxDOT **Supporting**: Camp Maxey, City of Paris, Lamar County	Areas of Camp Maxey with adjacency to public access points	Low	Long

Abbreviations:

ACUB - Army Compatible Use Buffer

AICUZ - Air Installation Compatible Use Zone

COG - Council of Governments

DoD – Department of Defense

FAA – Federal Aviation Administration

FCC – Federal Communications Commission

GIS - Geographic Information System

HB – House Bill

JAZ - Joint Airport Zone

JLUS – Joint Land Use Study

MOAs - Military Operating Areas

MTRs - Military Training Routes

NCTCOG – North Central Texas Council of Governments

REPI - Readiness and Environmental Protection Initiative

RCC - Regional Coordination Committee

RTAHP – Redmond Taylor Army Heliport

TCC - Texas Commander's Council

TxDOT - Texas Department of Transportation

UAS - Unmanned Aircraft Systems

USACE - U.S. Army Corps of Engineers

Time Frame:

Short 1 to 2 years

Mid 3 to 5 years

Long 5+ years

Compatibility Strategy Menu – Naval Air Station Forth Worth Joint Reserve Base and Communities

The table describes the recommended strategies for Naval Air Station (NAS) Forth Worth Joint Reserve Base (JRB) and civilian organizations to continue enhancing compatibility of land uses around the base, as well as recommendations for strengthening cooperation on a range of issues. These actions respond to issues and opportunities (listed below) identified by elected officials, Department of Defense (DoD) staff, and other community stakeholders. The menus organize strategies with the highest priority and shorter-term actions at the top of each category followed by less critical and longer-term measures. Partners should revisit the menu to adapt strategies in response to local conditions, available resources, and changing needs and priorities.

Issues/Opportunities:

- High levels of commercial and general aviation activity from the Dallas-Fort Worth International Airport, Dallas Love Field, and other regional airports can create areas of aircraft congestion, increasing safety risks and constraining available airspace capacity (**Aviation and Airspace Safety)**
- Drones/unmanned aircraft systems (UAS) can create physical hazards, such as midair strikes with aircraft, pose security and safety threats to military installations, or interrupt training flights and operations **(Aviation and Airspace Safety and Communication and Coordination**)
- Actions implemented since the 2008 Joint Land Use Study (JLUS)[1] and 2013 Planning for Livable Military Communities create a knowledge base to promote ongoing compatibility efforts across the region (**Communication and Coordination**)
- Consistent, active use of the existing Regional Coordination Committee (RCC) Development Review Web Tool among stakeholders would assist in promoting compatibility for proposed projects and broader long-term planning actions around NAS Fort Worth JRB (**Communication and Coordination**)

[1] Effective 9/1/17, Texas State House and Senate have passed HB 890 requires notice to purchasers of real property regarding the impact of military installations; cities and counties must provide access to the latest AICUZ or JLUS

- Residential turnover, and infill and redevelopment opportunities in communities around NAS Fort Worth JRB could bring new residents unfamiliar with military operations close to active training. Lack of familiarity can contribute to an increased perception of nuisance during flight operations (**Communication and Coordination**)
- Texas State House and Senate have passed House Bill (HB) 890, which requires notice to purchasers of real property regarding the impact of military installations; cities and counties must provide access to the latest compatibility studies (**Communication and Coordination** and **Statewide Policy/Legislative Actions**)
- State, federal, and local entities manage significant land and water resources near *Joining Forces* installations. Changes in ownership or use of resources could potentially alter known compatibility impacts on military operations (**Communication and Coordination**)
- Energy-related infrastructure, including utility-scale wind and solar, transmission lines, and gas wells can create aviation hazards near military airfields and Military Training Routes (MTRs), and interfere with air traffic control and onboard aircraft radar systems (**Energy Infrastructure**)
- The Electric Reliability Council of Texas (ERCOT) has implemented a Planning Guide policy that requires any Interconnecting Entity to certify that it has notified the DoD Siting Clearinghouse of a proposed generation resource and requested an informal or formal review (**Energy Infrastructure**)
- Increasing competition for frequency spectrum reduces the availability of bandwidth for military use (**Frequency and Spectrum Management**)
- Areas of higher aircraft accident risk and high average levels of aircraft noise extend from NAS Forth Worth JRB into surrounding communities. A lack of aviation-specific regulatory overlays in some areas may leave land vulnerable to future development or redevelopment that is potentially incompatible with safety risks and noise issues (**Land Use**)
- The presence of nature reserves, detention ponds, or sanitary landfills near airfields can attract birds and increase the risk of bird/aircraft strikes (**Land Use**)
- Local government plans set a policy framework for detailed compatibility actions. Some local government comprehensive planning studies, particularly older documents, lack specific language on compatibility with military installations (**Local Government Plans**)

- Changes in missions or aircraft operational levels or mix can produce new noise, safety, or other impacts on surrounding areas (**Military Plans/Operations)**
- Sound attenuation construction practices and energy efficient design can reduce indoor noise exposure from nearby military training activity (**Noise Management/Avoidance**)
- Military installations in the region currently implement a range of avoidance and mitigation strategies to reduce aircraft noise in surrounding areas (**Noise Management/Avoidance**)
- Lockheed Martin conducts flight testing, which can generate noise impacts on surrounding areas, particularly during aircraft hovering (**Noise Management/Avoidance**)
- NAS Fort Worth JRB aircraft generate noise impacts, including supersonic booms, that can affect communities underlying the Brady and Brownwood Military Operation Areas (MOAs) (**Noise Management/Avoidance**)
- Light pollution and glare from lighting applications and digital billboards can interfere with pilot vision and the use of night-vision training devices (**Outdoor Lighting/Signs)**
- Adjoining recreational amenities increase the risk of trespass onto military lands (**Physical Security**)
- North Central Texas Council of Governments (NCTCOG) and local communities have undertaken numerous studies and projects to enhance transportation access to NAS Fort Worth JRB and improve the function of area roadways (**Transportation**)

Summary of High Priority and Short Term Actions – NAS Forth Worth JRB and Communities

Category	Strategy
Airspace	Identify specific aviation areas vulnerable to security and safety threats from unauthorized UAS activity
Communication and Coordination	Incorporate stakeholder feedback to identify improvements to the RCC Development Review Web Tool to ensure continuity in use and enhance its effectiveness as a coordination and communication platform
Communication and Coordination	Support implementation of HB 890 by ensuring the ready availability of compatibility-related studies, such as the most recent AICUZ and/or JLUS
Communication and Coordination	Prepare and distribute a "welcome packet" with information on base background, mission, and operations for incoming residents to promote an understanding of operations and potential impacts
Communication and Coordination	Create a Technical Subcommittee of the RCC to share best practices and assist in the implementation of changes to the RCC Development Review Tool
Energy	Coordinate on the siting of energy infrastructure, complementary to state policy and legislation, to reduce safety threats to aviation activity • Coordinate to ensure that NAS Fort Worth JRB receives updated mapping of the location of energy infrastructure • Promote use of the RCC tool to facilitate coordination in the siting of energy infrastructure
Land Use	Explore adoption of a land use/development regulatory overlay to promote compatibility within clearly defined planning zones, including noise contours and airfield Accident Potential Zones
Local Government Plans	Continue to support area development/infill plans and designs that are consistent with the U.S. Navy's AICUZ land use compatibility guidelines, and maintain safety with aircraft operations along the extended centerline of the assault landing strip on NAS Fort Worth JRB
Noise Management	Adopt sound attenuation building standards and/or energy efficiency practices to achieve indoor noise reduction in the construction of sensitive receptors, such as housing, schools, or medical facilities within noise zones associated with range and airfield operations
Physical Security	Coordinate with RCC members to reduce the risk of trespass onto NAS Fort Worth JRB from Lake Worth or other areas around the installation's perimeter

Category	Strategy
Stormwater	Strengthen awareness and promote the implementation of *integrated* stormwater management (iSWM) strategies and Low Impact Development (LID) techniques to reduce flooding risks across the watershed • Conduct community outreach on the effects of additional impervious areas on stormwater quality and quantity • Connect communities and private sector developers with informational resources on iSWM and LID techniques • Develop an outline for a Stormwater Master Plan using iSWM and LID components for use by city and county governments • Highlight regional best practice examples of iSWM/LID techniques • Encourage creation of stream buffers, the preservation of open space, and limitations on clearing and grading to enhance natural drainage functions • Build on the efforts of the Countywide Watershed Management Roundtable to facilitate continued regional dialogue on stormwater issues and strategies
Stormwater	Enforce National Flood Insurance Program (NFIP) Regulations for the Farmers Branch Watershed to establish freeboard requirements above Federal Emergency Management Agency (FEMA) Base Flood Elevation (BFE) • Require developments to file a Letter of Map Revision (LOMR) if a project effects the established FEMA BFE
Stormwater	Increase the capacity and function of existing stormwater infrastructure through the re-grading of ditches and cleaning out culverts along highway corridors and the implementation of engineering improvements in storm drain inlets and upstream and on-system capture areas • Clearly define ongoing operation and maintenance responsibilities
Transportation	Continue implementing priority transportation and mobility projects to enhance access around NAS Fort Worth JRB and surrounding communities, including planned improvements to Meandering Road and the State Highway (SH) 183 and SH 199 corridors

Compatibility Strategies - NAS Fort Worth JRB and Communities

Strategy	Partners	Area	Priority	Time Frame
Aviation and Airspace Safety				
Identify specific aviation areas vulnerable to security and safety threats from unauthorized UAS activity, and coordinate with regional and local government efforts to create appropriate UAS ordinance adhering to relevant federal and state regulations	**Lead**: NAS Fort Worth JRB **Supporting**: City and County Governments	Airfield clearance zones; low-level approach and departure paths; and/or specified distance from airfield	High	Short
Communication and Coordination				
Incorporate stakeholder feedback to identify improvements to the RCC Development Review Web Tool to ensure continuity in use and enhance its effectiveness as a coordination and communication platform	**Lead**: NCTCOG **Supporting**: NAS Fort Worth JRB, Muncipalities, Tarrant County	Tarrant County and Municipalities	High	Short
Support implementation of HB 890 by ensuring the ready availability of compatibility-related studies, such as the most recent AICUZ and/or JLUS • Pursue legislation with TCC and Texas Military Preparedness Commission (TMPC) for adding new development and commercial development as part of the military disclosure process created by HB 890	**Lead**: Municipalities, Tarrant County **Supporting**: Greater Fort Worth Association of REALTORS®, NCTCOG, TCC, TMPC, Military Installations	Tarrant County and Municipalities	High	Short
Prepare and distribute a “welcome packet” with information on base background, mission, and operations for incoming residents to promote an understanding of operations and potential impacts	**Lead**: Muncipalities, NAS Fort Worth JRB **Supporting**: NCTCOG, Tarrant County	Areas inside AICUZ; and/or specified distance from installation boundary	High	Short

Create a Technical Subcommittee of the RCC to share best practices and assist in the implementation of changes to the RCC Development Review Tool	**Lead**: Muncipalities, NAS Fort Worth JRB **Supporting**: NCTCOG, Tarrant County	Areas inside AICUZ; and/or specified distance from installation boundary	High	Short
Update existing community outreach materials on compatibility to identify emerging issues, such as UAS operations and energy development	**Lead**: NAS Fort Worth JRB, NCTCOG **Supporting**: Municipalities, Tarrant County	Tarrant County and Municipalities	Medium	Short
Tailor communication and outreach to concentrations of vulnerable population groups, such as senior citizens, lower-income households, or households with limited English proficiency, based on spatial analysis of noise and safety impacts and population demographics	**Lead**: NCTCOG **Supporting**: Municipalities, Tarrant County, NAS Fort Worth JRB	Tarrant County and Municipalities	Medium	Short
Maintain an ongoing inventory of military-civilian compatibility actions implemented within the region to demonstrate best practices for knowledge sharing within the region • Develop and report on metrics to track progress in promoting compatible growth	**Lead**: NCTCOG **Supporting**: Municipalities, Tarrant County, NAS Fort Worth JRB	Tarrant County and Municipalities	Medium	Short
Establish a formal coordination process with the entities that manage the Lake Worth reservoir to ensure that ongoing operations, management actions, and plans consider environmental and security impacts on NAS Fort Worth JRB operations • Incorporate Lake Worth Watershed Greenprint findings and recommendations to maintain buffers around the installation • Explore Readiness and Environmental Protection Integration (REPI)-based opportunities to create buffers around the base and Lake Worth	**Lead**: NAS Fort Worth JRB, City of Lake Worth, City of Fort Worth **Supporting**: NCTCOG	Areas of NAS Fort Worth with adjacency to public access points	Medium	Mid

Strategy	Partners	Area	Priority	Time Frame
Energy Infrastructure				
Coordinate on the siting of energy infrastructure, complementary to state policy and legislation, to reduce safety threats to aviation activity • Coordinate to ensure that NAS Fort Worth JRB receives updated mapping of the location of energy infrastructure • Promote use of the RCC tool to facilitate coordination in the siting of energy infrastructure	**Lead**: Muncipalities, Tarrant County **Supporting**: NAS Fort Worth JRB, NCTCOG	SUAs; MOAs; MTRs; Areas inside AICUZ; and/or specified distance from installation	High	Short
Establish a formal local permitting/siting process for proposed energy projects that explicitly considers vertical intrusion, radar interference, visual distraction, or other potential impacts on military training and operations	**Lead**: Muncipalities **Supporting**: NAS Fort Worth JRB, NCTCOG, Tarrant County	SUAs; MOAs; MTRs; Areas inside AICUZ; and/or specified distance from installation	Medium	Mid
Environmental/Cultural Resources				
Explore REPI Program projects within areas around the main base or/and near off-base training areas: • Identify potential areas for land preservation and conservation programs through partnerships with installation and land conservation organizations, and land trust agencies to initiate land acquisition and military buffering • Align possible REPI areas with regional and local conservation priorities or opportunities for the voluntary acquisition of land in airfield Clear Zones, Accident Potential Zones, AICUZ, and other training areas • Meet with stakeholders to introduce conservation objectives, partnerships, and benefits to the community and base	**Lead**: NAS Fort Worth JRB **Supporting**: Natural Resources Conservation Service, Texas A&M University, Texas A&M AgriLife Extension Service; U.S. Fish & Wildlife Service, DoD, City and County Governments	Conservation lands as identified near NAS Fort Worth JRB or off base training areas	Medium	Short

Strategy	Partners	Area	Priority	Time Frame
Frequency and Spectrum Management				
Identify "Exclusion Zones" for military Navigational Aid (NAVAID) protection to assist local governments in siting decisions: • Provide guidelines and maps of exclusion zones and notification areas to city and county governments and relevant state agencies • Pursue implementation of guidelines and exclusion zones in local zoning code • Pursue state legislation to support notification areas	**Lead**: NAS Fort Worth JRB **Supporting:** Muncipalities, Tarrant County, NCTCOG	Designated Exclusions Zones as identified	High	Mid
Land Use				
Explore adoption of a land use/development regulatory overlay to promote compatibility within clearly defined planning zones, including noise contours, and airfield Accident Potential Zones	**Lead**: Muncipalities **Supporting:** NCTCOG, Tarrant County	Areas inside AICUZ	High	Short to Mid
Reduce bird attraction by 1) establishing siting and design standards for uses, such as detention ponds, sanitary landfills, and crops in areas subject to low-level flights, 2) planting of vegetation and habitats compatible with missions at base, and 3) coordinating on Bird/Animal Aircraft Strike Hazard (BASH) measures with resource management entities • Coordinate with dredging operators in the Lake Worth area to ensure that any future dredging activities are scheduled and planned to minimize BASH occurrences; e.g., avoid dredging during winter • Continue approved/appropriate maintenance and trimming of vegetation and trees within and around property boundary • Coordinate with business owners adjacent to the installation to ensure debris and trash are properly covered	**Lead**: Muncipalities **Supporting**: NAS Fort Worth JRB, Tarrant County, NCTCOG	Areas inside AICUZ; low-level approach and departure paths; and/or specified distance from airfield	Medium	Mid

Strategy	Partners	Area	Priority	Time Frame
Use capital improvement planning and infrastructure system requirements to shape growth patterns and promote less dense, compatible development or infill redevelopment in areas exposed to military operational impacts, such as noise and safety risks	**Lead**: Muncipalities **Supporting:** Tarrant County, NCTCOG, NAS Fort Worth JRB	Tarrant County and Municipalities	Medium	Long
Explore feasibility of the voluntary acquisition of land in airfield Clear Zones and Accident Potential Zones	**Lead**: Muncipalities **Supporting**: NAS Fort Worth JRB, Tarrant County, NCTCOG	Airfield Clear Zones and Accident Potential Zones	Low	Long
Local Government Plans				
Continue to support area development/infill plans and designs that are consistent with the U.S. Navy's Air Installation Compatible Use Zone (AICUZ) land use compatibility guidelines, and maintain safety with aircraft operations along the extended centerline of the assault landing strip on NAS Fort Worth JRB	**Lead**: City of Fort Worth **Supporting:** NCTCOG, NAS Fort Worth JRB	City of Fort Worth	High	Short
Continue to implement the recommendations in the Planning for Livable Military Communities (PLMC) document	**Lead**: Muncipalities, Tarrant County **Supporting:** NCTCOG, NAS Fort Worth JRB	Tarrant County and Municipalities	Medium	Mid
Incorporate compatibility in updates of Comprehensive Plans; sector, neighborhood, and corridor plans; and other policy documents, including references to compatibility with NAS Fort Worth JRB, maps, and recommendations identified in the JLUS or other plans, such as PLMC	**Lead**: Muncipalities, Tarrant County **Supporting:** NCTCOG, NAS Fort Worth JRB	Tarrant County and Municipalities	Medium	Mid
Military Plans/Operations				
Conduct additional analysis as necessary to reflect potentially significant changes in noise, safety, or other operational impacts associated with new military missions or aircraft	**Lead**: NAS Fort Worth JRB **Supporting**: Muncipalities, Tarrant County	Affected environment as determined by analysis	Medium	Long

Strategy	Partners	Area	Priority	Time Frame
Noise Management/Avoidance				
Adopt sound attenuation building standards and/or energy efficiency practices to achieve indoor noise reduction in the construction of sensitive receptors, such as housing, schools, or medical facilities within noise zones associated with range and airfield operations	**Lead**: Muncipalities, Tarrant County **Supporting:** NCTCOG	Areas inside AICUZ	High	Short to Mid
Continue managing off-installation aviation noise impacts through feasible operational or timing adjustments that will not negatively affect training or readiness to reduce noise exposure on local communities and sensitive locations	**Lead**: NAS Fort Worth JRB	SUAs; MOAs; MTRs; Areas inside AICUZ	Medium	Short
Conduct additional outreach on noise impacts in affected communities underlying MOAs and MTRs	**Lead**: NAS Fort Worth JRB **Supporting:** Municipalities and Counties	Brady and Brownwood MOAs	Medium	Mid
Explore development of an incentive program, in partnership with the business community, to offer assistance (either grants or low-interest loans) to low- and moderate-income homeowners and other noise sensitive receptors to retrofit structures to provide sound attenuation	**Lead**: NCTCOG **Supporting:** Municipalities, Tarrant County, HUD, private sector	Areas inside AICUZ	Medium	Mid
Establish a sound mitigation certification program and certification program for homebuilders to promote implementation of noise attenuation construction practices	**Lead**: NCTCOG **Supporting:** Municipalities, Tarrant County, private sector	Areas inside AICUZ	Medium	Mid
Connect homeowners and other noise sensitive receptors to available resources, such as weatherization and energy efficiency programs, that offer guidance and incentives for the energy efficient retrofitting of structures	**Lead**: Muncipalities, Tarrant County **Supporting**: NCTCOG, Texas State Energy Conservation Office	Areas inside AICUZ	Low	Mid

Strategy	Partners	Area	Priority	Time Frame
Outdoor Lighting/Signs				
Explore dark-sky provisions that require or promote the use of fully shielded, cut-off outdoor lighting applications for major new developments (e.g. commercial, industrial uses, airports and airfields, outdoor sports stadiums) near military airfields	**Lead**: Muncipalities, Tarrant County **Supporting**: NAS Fort Worth JRB	Areas inside AICUZ; low-level approach and departure path	High	Medium
Coordinate with military installations on the siting and design of digital billboards and light-emitting diode (LED) lighting in airfield flight paths to reduce visual distraction of pilots	**Lead**: Muncipalities, Tarrant County **Supporting**: NAS Fort Worth JRB	Areas inside AICUZ; low-level approach and departure paths	Medium	Short
Encourage the retrofitting of older, large-scale unshielded lighting applications (e.g. big-box commercial, major industrial uses, airports and airfields, outdoor sports stadiums) through an outreach campaign and use of energy efficiency incentives	**Lead**: Muncipalities, Tarrant County **Supporting**: NAS Fort Worth JRB	Areas inside AICUZ; low-level approach and departure paths	Low	Long
Physical Security				
Explore opportunities to enhance installation perimeter security and entry control points at NAS Fort Worth JRB • Coordinate with RCC members to reduce the risk of trespass onto NAS Fort Worth JRB from Lake Worth or other areas around the installation's perimeter • Conduct community outreach on the safety and security risks associated with trespass on NAS Fort Worth JRB, including the prohibition of photography or any other recording of imagery of base property	**Lead**: Muncipalities, Tarrant County **Supporting**: NAS Fort Worth JRB	Areas of NAS Fort Worth, JRB with adjacency to public lands or public access points	Medium	Mid

Strategy	Partners	Area	Priority	Time Frame
Stormwater/Drainage				
Strengthen awareness and promote the implementation of iSWM strategies and LID techniques to reduce flooding risks across the watershed • Conduct community outreach on the effects of additional impervious areas on stormwater quality and quantity • Connect communities and private sector developers with informational resources on iSWM and LID techniques • Develop an outline for a Stormwater Master Plan using iSWM and LID components for use by city and county governments • Highlight regional best practice examples of iSWM/LID techniques • Encourage creation of stream buffers, the preservation of open space, and limitations on clearing and grading to enhance natural drainage functions • Build on the efforts of the Countywide Watershed Management Roundtable to facilitate continued regional dialogue on stormwater issues and strategies	**Lead**: NCTCOG **Supporting**: Muncipalities, Tarrant County	Watershed	High	Short
Increase the capacity and function of existing stormwater infrastructure through the re-grading of ditches and cleaning out culverts along highway corridors and the implementation of engineering improvements in storm drain inlets and upstream and on-system capture areas • Clearly define ongoing operation and maintenance responsibilities	**Lead**: TxDOT, City of White Settlement, City of Fort Worth **Supporting**: Tarrant County	Watershed NAS Fort Worth JRB	High	Short to Mid

Strategy	Partners	Area	Priority	Time Frame
Enhance erosion control to assist in maintaining the function and capacity of stormwater infrastructure through the use of measures, including: • Drop structures • Baffle blocks • Rock riprap downstream of culverts and bridge abutments • Concrete line ditches	**Lead**: TxDOT, City of White Settlement, City of Fort Worth **Supporting**: Tarrant County, NAS Fort Worth JRB	Watershed NAS Fort Worth JRB	High	Short to Mid
Conduct a detailed hydrology and hydraulic study for the Farmers Branch Watershed and NAS Fort Worth JRB by updating the 2005 Section 205 hydrology and hydraulics: • Incorporate best available information from LIDAR and new survey for channels and bridge, culverts and storm drains, overtopping elevations, gutters, flowlines, and pipe inverts • Use the analysis to set higher design standards for state and city facilities, including providing freeboard at roadway crossings	**Lead**: TxDOT, City of White Settlement, City of Fort Worth **Supporting**: FEMA, USACE, NCTCOG, Tarrant County, NAS Fort Worth JRB, private sector	Watershed NAS Fort Worth JRB	High	Mid to Long
Maintain pre-development site runoff levels through the use of strategies, including: • Detention ponds or underground storage • Vegetated swales • Rain gardens • Re-routing of storm drain systems • Maintenance of green space • Buyout of properties in floodplains	**Lead**: FEMA **Supporting**: Muncipalities, Tarrant County, NCTCOG, USACE, private sector	Watershed	Medium	Mid to Long

Strategy	Partners	Area	Priority	Time Frame
Transportation				
Continue implementing priority transportation and mobility projects to enhance access into and around NAS Fort Worth JRB and surrounding communities, including planned improvements to Meandering Road and the SH 183 and 199 corridors	**Lead**: Muncipalities, Tarrant County, NCTCOG, TxDOT **Supporting**: NAS Fort Worth JRB	Areas of NAS Fort Worth JRB with adjacency to public access points	High	Short to Mid
Alleviate traffic congestion issues on base and in the surrounding communities through measures such as: • Continuing joint coordination of drill weekend schedules • Promoting alternative transportation and flexible work hours • Promoting shuttles to and from the base during drill weekends • Seeking public transportation options to/from Dallas/Fort Worth International Airport • Organizing and promoting incentive programs and transportation alternatives • Promoting awareness of existing federal incentive alternative transportation programs and NCTCOG regional transportation programs	**Lead**: NAS Fort Worth JRB **Supporting**: Muncipalities, Tarrant County, NCTCOG, TxDOT, private sector	Areas of NAS Fort Worth JRB with adjacency to public access points	Medium	Short to Mid

Abbreviations:

AICUZ - Air Installation Compatible Use Zones

BASH - Bird/Animal Aircraft Strike Hazard

BFE - Base Flood Elevation

DoD – Department of Defense

ERCOT - Electric Reliability Council of Texas

FAA – Federal Aviation Administration

FCC – Federal Communications Commission

FEMA - Federal Emergency Management Agency

HB – House Bill

HUD – Department of Housing and Urban Development

JRB - Joint Reserve Base

iSWM - *integrated* Stormwater Management

LED - light-emitting diode (

LID - Low Impact Development

LOMR - Letter of Map Revision

MOAs - Military Operating Areas

MTRs - Military Training Routes

NAS - Naval Air Station

NAVAID - Navigational Aid

NCTCOG – North Central Texas Council of Governments

NFIP - National Flood Insurance Program

PLMC - Planning for Livable Military Communities

RCC - Regional Coordination Committee

SH – State Highway

SUA – Special Use Airspace

TCC - Texas Commander's Council

TMPC - Texas Military Preparedness Commission

TxDOT - Texas Department of Transportation

UAS - Unmanned Aircraft Systems

USACE - U.S. Army Corps of Engineers

Time Frame:

Short 1 to 2 years

Mid 3 to 5 years

Long 5+ years

Compatibility Strategy Menu – Redmond Taylor Army Heliport and Communities

The table describes the recommended strategies for Redmond Taylor Army Heliport (RTAHP) and civilian organizations to continue enhancing compatibility of land uses around RTAHP, as well as recommendations for strengthening cooperation on a range of issues. These actions respond to issues and opportunities (listed below) identified by elected officials, Department of Defense (DoD) staff, and other community stakeholders. The menus organize strategies with the highest priority and shorter-term actions at the top of each category followed by less critical and longer-term measures. Partners should revisit the menu to adapt strategies in response to local conditions, available resources, and changing needs and priorities.

Issues/Opportunities:

- High levels of commercial and general aviation activity from the Dallas-Fort Worth International Airport, Dallas Love Field, and other regional airports can create areas of aircraft congestion, increasing safety risks and constraining available airspace capacity. Aviation congestion restricts the use of airspace for RTAHP training operations. (**Aviation and Airspace Safety)**
- Drones/unmanned aircraft systems (UAS) can create physical hazards, such as midair strikes with aircraft, or pose security and safety threats to military installations **(Aviation and Airspace Safety**)
- There is an absence of formal channels of communication and coordination between RTAHP and surrounding communities and a desire for increased military-civilian outreach and coordination (**Communication and Coordination**)
- The City of Dallas has explored re-use opportunities for the Hensley Field site. RTAHP is the "long term" tenant for this portion of Hensley Field with expectation of tenancy to continue until the 2037-39 period (**Communication and Coordination**)
- There is an existing settlement agreement between the City of Dallas and the U.S. Navy that requires the Navy to complete a full soil and water cleanup to residential standards by 2017
- Residential turnover and infill and redevelopment opportunities in communities could bring new residents unfamiliar with military operations close to active training. Lack of familiarity can contribute to an increased perception of nuisance during flight operations (**Communication and Coordination**)

- Texas State House and Senate have passed House Bill (HB) 890, which requires notice to purchasers of real property regarding the impact of military installations; cities and counties must provide access to the latest compatibility studies (**Communication and Coordination** and **Statewide Policy/Legislative Actions**)
- State, federal, and local entities manage significant land and water resources near *Joining Forces* installations. Changes in ownership or use of resources could potentially alter known compatibility impacts on military operations (**Communication and Coordination**)
- Energy-related infrastructure, including utility-scale wind and solar, transmission lines, and gas wells, can create aviation hazards near military airfields and Military Training Routes (MTRs) and interfere with air traffic control and onboard aircraft radar systems (**Energy Infrastructure**)
- Areas of higher aircraft accident risk and high average levels of aircraft noise extend from RTAHP into surrounding communities. The City of Dallas has identified noise contours (indicating areas of higher noise exposure) over Hensley Field, and an avigation easement is in place. (**Land Use**)
- The presence of parks, lakes, detention ponds, or sanitary landfills near airfields can attract birds and increase the risk of bird/aircraft strikes (**Land Use**)
- Local government plans set a policy framework for detailed compatibility actions. Some local government comprehensive planning studies, particularly older documents, lack specific language on compatibility with military installations (**Local Government Plans**)
- Changes in missions or aircraft operational levels or mix can produce new noise, safety, or other impacts on surrounding areas (**Military Plans/Operations**)
- Installations in the region host significant training activity by visiting military units. A lack of familiarity with nearby areas off the installation may contribute to increased noise or safety exposure during training (**Military Plans/Operations**)
- RTAHP helicopter operations generate noise impacts that affect residents in the Redbird community of Dallas and near Dallas Executive Airport (**Noise Management/Avoidance**)
- Sound attenuation construction practices and energy efficient design can reduce indoor noise exposure from nearby military training activity (**Noise Management/Avoidance**)
- RTAHP currently implements a range of avoidance and mitigation strategies to reduce aircraft noise exposure in surrounding areas (**Noise Management/Avoidance**)
- Light pollution and glare from lighting applications and digital billboards can interfere with pilot vision and the use of night-vision training devices (**Outdoor Lighting/Signs)**

- Adjoining recreational amenities and nearby residential areas increase the potential for trespass onto military lands and expose people to safety risks (**Physical Security**)
- Deficiencies in condition and/or capacity in the transportation network surrounding RTAHP can affect the movement of military personnel or equipment and increase safety risks for all users (**Transportation**)
- The need for military personnel to move heavy equipment through the adjacent residential area can be disruptive to residents and harmful to residential streets (**Transportation**)
- The bridge inside the installation gate is aging and may need repair **(Transportation)**

Summary of High Priority and Short Term Actions – RTAHP and Communities

Category	Strategy
Airspace	Identify specific aviation areas vulnerable to security and safety threats from unauthorized UAS activity
Communication and Coordination	Continue briefings with regional partners to build support and strengthen engagement in ongoing *Joining Forces* compatibility implementation activities
Communication and Coordination	RTAHP to enhance its participation in established channels of communication for major community actions, such as proposed zoning changes, that have potential compatibility impacts: • Leverage relevant existing meetings and communication methods in departments, such as the City of Dallas Real Estate Division of the Sustainable Development and Construction Department and the City of Dallas Aviation Department
Communication and Coordination	Support implementation of HB 890 by ensuring the ready availability of compatibility-related studies, such as the most recent Air Installation Compatible Use Zone (AICUZ) and/or Joint Land Use Study (JLUS) [1]
Communication and Coordination	Develop outreach materials to include information on mission, economic impact, and clear points of contact at RTAHP, as well as a map highlighting general operational impacts such as noise in surrounding communities
Communication and Coordination	Support implementation of HB 890 by ensuring the ready availability of compatibility-related studies, such as the most recent AICUZ and/or JLUS
Communication and Coordination	Collaboratively develop a framework for on-site maintenance, infrastructure, and tenant activity that promotes compatible community and military uses at RTAHP
Energy	Coordinate on the siting of energy infrastructure to reduce safety threats to aviation activity • Coordinate to ensure that RTAHP receives updated mapping of the location of energy infrastructure
Noise Management	Use aircraft noise attenuation requirements in the existing building code to promote compatible development within noise contours established for Hensley Field
Noise Management	Consider sound attenuation building standards and/or energy efficiency practices to achieve indoor noise reduction in the construction of sensitive receptors, such as housing, schools, or medical facilities within noise zones
Noise Management	Initiate outreach to neighborhoods experiencing noise impacts from RTAHP operations, including areas in proximity to RTAHP and Dallas Executive Airport

[1] Effective 9/1/17, Texas State House and Senate have passed HB 890, which requires notice to purchasers of real property regarding the impact of military installations; cities and counties must provide access to the latest AICUZ or JLUS

Revised Compatibility Strategies – RTAHP and Communities

Strategy	Partners	Area	Priority	Timeframe
Aviation and Airspace Safety				
Identify specific aviation areas vulnerable to security and safety threats from unauthorized UAS activity	**Lead**: RTAHP **Supporting**: City of Dallas, City of Grand Prairie, Dallas County	Airfield clearance zones; low-level approach and departure paths; and/or specified distance from airfield	High	Short
Communication and Coordination				
Continue briefings with regional partners to build support and strengthen engagement in ongoing *Joining Forces* compatibility implementation activities	**Lead**: NCTCOG **Supporting**: City and County Governments	City of Dallas, City of Grand Prairie, Dallas County	High	Short
RTAHP to enhance its participation in established channels of communication regarding major community actions, such as proposed zoning changes, that have potential compatibility impacts: • Leverage relevant existing meetings, communication methods, and points of contact in departments, such as the City of Dallas Real Estate Division of the Sustainable Development and Construction Department, the City of Dallas Aviation Department, the City of Grand Prairie City Council Development Committee, and Real Property at the Texas Military Department	**Lead**: RTAHP, City of Dallas, City of Grand Prairie **Supporting**: NCTCOG, Real Property - Texas Military Department, Dallas County	City of Dallas, City of Grand Prairie, Dallas County	High	Short

Strategy	Partners	Area	Priority	Timeframe
Post compatibility-related studies, such as the most recent AICUZ and/or JLUS, on local government websites to comply with HB 890	**Lead**: NCTCOG **Supporting**: City of Dallas, City of Grand Prairie, Dallas County, RTAHP, MetroTex Association of REALTORS	City of Dallas, City of Grand Prairie, Dallas County	High	Short
Develop outreach materials to include information on mission, economic impact, and clear points of contact at RTAHP, as well as a map highlighting general operational impacts such as noise in surrounding communities	**Lead**: RTAHP **Supporting**: Texas Military Department, NCTCOG, City of Dallas, City of Grand Prairie, Dallas County	City of Dallas, City of Grand Prairie, Dallas County	High	Short
RTAHP to continue communications through contact established in its lease agreement	**Lead**: RTAHP, City of Dallas, City of Grand Prairie, Dallas County **Supporting**: NCTCOG, Texas Military Department	RTAP	High	Short to Mid
Work with RTAHP to develop a voluntary memorandum of agreement that establishes joint consultation and communication procedures for changes in military operations and proposed local ordinances, rules, plans or structures that could create compatibility issues	**Lead**:, City of Grand Prairie, Dallas County **Supporting**: RTAHP, Texas Military Department, NCTCOG	Areas inside low-level approach and departure paths; and/or specified distance from airfield	Medium	Mid
Conduct at least an annual briefing in partner communities to increase awareness of missions, training schedules and special exercises, and any foreseeable operational changes or training workload	**Lead**: RTAHP **Supporting**: Texas Military Department	City of Dallas, City of Grand Prairie, Dallas County	Medium	Mid

Strategy	Partners	Area	Priority	Timeframe
Continue to conduct on-installation visits, "field trips," and open houses on an annual basis to increase awareness of the military mission among the public, key stakeholders, and representatives of *Joining Forces* partner entities • Build on existing efforts such as coordination with aviation program at Grand Prairie ISD	**Lead**: RTAHP **Supporting**: Texas Military Department	City of Dallas, City of Grand Prairie, Dallas County	Medium	Mid
Prepare and distribute a "welcome packet" with information on base background, mission, and operations for incoming residents to promote an understanding of operations and potential impacts	**Lead**: RTAHP, Texas Military Department **Supporting**: City of Dallas, City of Grand Prairie, Dallas County	Areas with adjacency to base and airfield: airfield clearance zones; low-level approach and departure paths; and/or specified distance from installation boundary	Medium	Mid
Establish a formal coordination process with the entities that manage Mountain Creek Lake to ensure that ongoing operations, management actions, and plans consider environmental and security impacts on RTAHP operations	**Lead**: RTAHP, Texas Military Department, U.S. Army Corps of Engineers, Texas Parks and Wildlife Department, Excelon Energy Company **Supporting**: City of Dallas, City of Grand Prairie, Dallas County	Areas of RTAHP with adjacency to public lands	Medium	Mid

Strategy	Partners	Area	Priority	Timeframe
Energy Infrastructure				
Coordinate on the siting of energy infrastructure to reduce safety threats to aviation activity • Coordinate to ensure that RTAHP receives updated mapping of the location of energy infrastructure	**Lead**: City of Grand Prairie, Dallas County **Supporting**: RTAHP, NCTCOG	Airfield clearance zones; low-level approach and departure paths; and/or specified distance from installation boundary	High	Short
RTAHP to monitor and comment, as appropriate the permitting and the siting process for proposed energy projects to consider vertical intrusion, radar interference, visual distraction or other potential compatibility impacts on military training and operations.	**Lead**: RTAHP, NCTCOG **Supporting**: City of Grand Prairie, Dallas County	Airfield clearance zones; low-level approach and departure paths; and/or specified distance from installation boundary	Medium	Mid
Land Use				
Explore adoption of a land use/development regulatory overlay to promote compatible development within clearly defined planning zones around RTAHP, including noise contours and airfield Accident Potential Zones	**Lead**: City of Grand Prairie **Supporting:** RTAHP, NCTCOG	Areas inside noise contours	Medium	Mid
Use existing siting and design standards in the City of Dallas, as well as North Central Texas Council of Governments' (NCTCOG's) General Aviation and Heliport System Plan to reduce bird attraction associated with uses, such as detention ponds, sanitary landfills, and crops in low-level flight areas: Coordinate on Bird/Animal Aircraft Strike Hazard (BASH) measures with resource management entities	**Lead**: City of Dallas, City of Grand Prairie **Supporting**: RTAHP, NCTCOG, Dallas County	Areas inside low-level approach and departure paths; and/or specified distance from airfield	Medium	Mid
Consider capital improvement planning and infrastructure system requirements that promote compatible development or redevelopment in areas exposed to military operational impacts, such as noise and safety risks	**Lead**: City of Dallas, City of Grand Prairie, Dallas County **Supporting**: NCTCOG	City of Dallas, City of Grand Prairie, Dallas County	Medium	Mid

Strategy	Partners	Area	Priority	Timeframe
Local Government Plans				
Consider Inviting *Joining Forces* partners, as relevant, to participate as a stakeholder in major plan updates and amendments, including Comprehensive Plans, and area, neighborhood, or corridor plans, which could affect RTAHP operations	**Lead**: City of Dallas, City of Grand Prairie, Dallas County **Supporting**: RTAHP, Texas Military Department	City of Dallas, City of Grand Prairie, Dallas County	High	Short
Consider compatibility in updates of Comprehensive Plans; and area, neighborhood, or corridor plans, which could affect RTAHP operations	**Lead**: City of Dallas, City of Grand Prairie, Dallas County **Supporting**: RTAHP, Texas Military Department	City of Dallas, City of Grand Prairie, Dallas County	High	Ongoing
Military Plans/Operations				
Conduct briefings of visiting military units and U.S. training detachments to increase an understanding of training impacts, such as noise or military vehicle convoys on surrounding areas and promote compliance with existing mitigation procedures	**Lead**: RTAHP **Supporting**: Texas Military Department	Areas with adjacency to RTAHP training and aviation operations	Medium	Short
Conduct additional analysis as necessary to provide local governments with information on potentially significant changes in noise, safety, or other operational impacts associated with new military missions or aircraft	**Lead**: RTAHP, Texas Military Department **Supporting**: City of Dallas, City of Grand Prairie, Dallas County	Affected environment as determined by analysis	Low	Long
Conduct additional analysis as necessary to determine the feasibility of the relocation of the RTAHP military mission to other regional facilities	**Lead**: RTAHP, Texas Military Department **Supporting**: City of Dallas, City of Grand Prairie, Dallas County	Affected environment as determined by analysis	Low	Long

Strategy	Partners	Area	Priority	Timeframe
Noise Management/Avoidance				
Use aircraft noise attenuation requirements in the existing building code to promote compatible development within noise contours established for Hensley Field	**Lead**: City of Dallas **Supporting:** RTAHP	Areas inside noise contours	High	Short
Consider sound attenuation building standards and/or energy efficiency practices to achieve indoor noise reduction in the construction of sensitive receptors, such as housing, schools, or medical facilities within noise zones	**Lead**: City of Grand Prairie **Supporting:** RTAHP	Areas inside noise contours	High	Short to Mid
Initiate outreach to neighborhoods experiencing noise impacts from RTAHP operations, including areas in proximity to RTAHP, Dallas Executive Airport, and Midway Regional Airport	**Lead**: RTAHP, Texas Military Department **Supporting:** City of Dallas, City of Grand Prairie, Dallas County, NCTCOG	Noise contours or other noise exposed training areas	High	Short to Mid
Manage and reduce off-installation aviation noise impacts through feasible operational or timing adjustments that will not negatively affect training or readiness	**Lead**: RTAHP, Texas Military Department	Noise contours or other noise exposed training areas	Medium	Short
Connect homeowners and other noise sensitive receptors to available resources, such as weatherization and energy efficiency programs, that offer guidance and incentives for the energy efficient retrofitting of structures	**Lead**: City of Dallas, City of Grand Prairie, Dallas County **Supporting**: NCTCOG, Texas State Energy Conservation Office	Noise contours or other noise exposed training areas	Low	Mid

Strategy	Partners	Area	Priority	Timeframe
Outdoor Lighting/Signs				
Explore dark-sky provisions that require or promote the use of fully shielded, cut-off outdoor lighting applications for major new developments (e.g. commercial, industrial uses, airports and airfields, outdoor sports stadiums) near military airfields	**Lead**: City of Dallas, City of Grand Prairie, Dallas County **Supporting**: RTAHP	Airfield clearance zones; low-level approach and departure paths; and/or specified distance from installation boundary	Medium	Mid
Use existing approval processes to coordinate with military installations on the siting and design of digital billboards in airfield flight paths to reduce visual distraction of pilots	**Lead**: City of Dallas, City of Grand Prairie, Dallas County **Supporting**: RTAHP	Airfield clearance zones; low-level approach and departure paths; and/or specified distance from installation boundary	Medium	Short
Encourage the retrofitting of older, large-scale unshielded lighting applications (e.g. big-box commercial, major industrial uses, airports and airfields, outdoor sports stadiums)	**Lead**: City of Dallas, City of Grand Prairie, Dallas County **Supporting**: RTAHP	Airfield clearance zones; low-level approach and departure paths; and/or specified distance from installation boundary	Low	Long
Physical Security				
Explore opportunities to enhance installation perimeter security and entry control points at RTAHP • Conduct community outreach on the safety and security risks associated with trespass on RTAHP	**Lead**: RTAHP, Texas Military Department **Supporting**: City of Dallas, City of Grand Prairie, Dallas County	Areas of RTAHP with adjacency to public lands or public access points	Medium	Mid

Coordinate with Mountain Creek Lake management entities on security issues, and enhance outreach to recreational users on the safety risks associated with trespass onto RTAHP	**Lead**: RTAHP, Texas Military Department, U.S. Army Corps of Engineers, Texas Parks and Wildlife Department, Excelon Energy Company **Supporting**: City of Dallas, City of Grand Prairie	Areas of RTAHP with adjacency to public lands or public access points	Medium	Mid
Transportation				
Identify any strategic upgrades or improved maintenance necessary to ensure the safety and adequacy of the supporting road network surrounding RTAHP	**Lead**: NCTCOG, TxDOT, RTAHP, Texas Military Department **Supporting**: City of Dallas, City of Grand Prairie, Dallas County	Areas of RTAHP with adjacency to public access points	Medium	Mid
Explore the possibility of moving the entrance gate to the northeast side of RTAHP to enhance safety and reduce conflicts with the surrounding residential neighborhood	**Lead**: RTAHP, Texas Military Department **Supporting**: NCTCOG, City of Dallas, City of Grand Prairie	Entry point of RTAHP	Medium	Long

Abbreviations:

AICUZ - Air Installation Compatible Use Zone
BASH - Bird/Animal Aircraft Strike Hazard
DoD – Department of Defense
FAA – Federal Aviation Administration
FCC – Federal Communications Commission
MOAs - Military Operating Areas
MTRs - Military Training Routes
NCTCOG – North Central Texas Council of Governments
RCC - Regional Coordination Committee
TCC - Texas Commander's Council
TxDOT - Texas Department of Transportation
UAS - Unmanned Aircraft Systems

Timeframe:

Short 1 to 2 years
Mid 3 to 5 years
Long 5+ years

Technical Appendix C.

Existing Conditions Report

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Executive Summary

The *Joining Forces* Joint Land Use Study (JLUS) is a collaborative process among local, state, and regional jurisdictions; the public; federal, state, and regional agencies; and military installations within the North Texas region. The JLUS will present recommendations for consideration by local and state governments to promote compatible development that protects public health, safety, and welfare, and the ability of the military to accomplish its vital training and operational missions. The study is designed to create dialogue around complex issues such as land use, economic development, infrastructure, environmental sustainability, and the operational demands and mission changes of military entities. The intent of the study is to highlight common interests such as economic growth, more efficient infrastructure, healthier and safer environments, improved quality of life, and the protection of Department of Defense (DoD) and civilian investments.

The Final JLUS Report will provide a series of recommendations to guide future decisions and policy actions by public agencies, military installations, and other *Joining Forces* partners. The purpose of the Existing Conditions Report is to describe the regional military installations and surrounding communities, and identify preliminarily existing compatibility issues within the study area.

The *Joining Forces* study area consists of the major military training facilities and related airspace in the North Texas region and surrounding communities (See **Table 1** and **Figure 1**). Military installations included in the study are Naval Air Station Fort Worth, Joint Reserve Base (NAS Fort Worth, JRB); Redmond Taylor Army Heliport (RTAHP); Fort Wolters Training Center; Camp Maxey Training Center; Eagle Mountain Training Center; Brownwood and Brady Military Operating Areas (MOAs); and Colonel Stone Army Reserve Center. The area surrounding these

facilities encompasses 24,200 square miles, including portions of 18 counties and more than 60 cities or census-designated communities in proximity to military operations. The final JLUS document will produce a tailored set of compatibility recommendations to reflect the diversity of the region and its stakeholders.

Members of the planning team have collected information about existing conditions and plans for all military installations, as well as the major adjacent and affected communities. In addition, team members conducted numerous individual interviews with military and community leaders and held four public meetings in various locations around the region.

This initial investigation has identified the following key themes, as well as compatibility issues for further study in the next phase of the *Joining Forces* process.

- Strong support for the military mission in surrounding communities and an understanding of the positive economic impact of the installations and military missions;
- Relatively few complaints related to existing noise or operational impacts with the exception of specific pockets of noise sensitivity, particularly near RTAHP;
- Recognition that even in mature, stable communities with long-standing ties to the military, residential turnover and infill and redevelopment opportunities could bring new residents unfamiliar with military operations close to active training;
- Lack of county regulatory tools, such as zoning, to address even modest growth on unincorporated land in rural areas;
- Strong westward growth trajectory within the region that could bring new development to previously rural areas surrounding installations and to areas underlying MOAs;
- Effectiveness of existing coordination mechanisms, such as the Regional Coordination Committee Development Review Web Tool and ongoing military outreach around NAS Fort Worth, JRB;

- Successful implementation of zoning overlay tools around NAS Fort Worth, JRB in the Cities of Benbrook and Fort Worth and sound attenuation guidelines in other communities;
- Presence of sensitive environmental resources around Fort Wolters and Camp Maxey and resulting training constraints at Camp Maxey;
- Specific encroachment challenges related to noise, land use, and airspace at RTAHP;
- Absence of formal channels of communication and coordination outside of the NAS Fort Worth, JRB portion of the region and a desire for increased military-civilian outreach and coordination in communities surrounding RTAHP, Camp Maxey, and Fort Wolters;
- Risk of trespass onto military lands from adjoining recreational amenities or residential areas;
- Risk of wildfires around Fort Wolters and Camp Maxey;
- Need for strategies to address emerging challenges related to energy infrastructure siting (wind farms) especially in unincorporated areas and UAS operations near airfields; several cities indicated interest in operating drones for law enforcement or other public purposes;
- Opportunities for better coordination and sharing of military resources across installation boundaries; and
- Support for additional compatibility measures previously identified but not yet implemented, such as Notification agreements by defense communities that propose to adopt or amend an ordinance, rule, or plan that would be applicable in a controlled compatible land use area around the installation.

1. Purpose and Background

A Joint Land Use Study (JLUS) is a collaborative process among local governments, military installations, citizens, and other stakeholders to identify and help mitigate and prevent encroachment issues that may affect current and future military missions and nearby communities. Encroachment occurs when conditions outside the military installation limit the ability of the military to perform its mission safely and effectively, or when military operations diminish quality of life in surrounding areas. This JLUS effort for the North Texas region—*Joining Forces*—seeks to facilitate dialogue around common interests and strengthen community-military compatibility through communication, education, and the planning process.

1.1 *Joining Forces* Goals

Joining Forces builds on the momentum of ongoing regional planning initiatives and prior compatibility studies. Reflecting the size, complexity, and economic dynamism of the region, the goals of this study are to:

- Balance the region's strong population growth and development while providing a mission sustainable environment for protection of current and future military operational capabilities;
- Address encroachment issues associated with emerging technologies, such as renewable energy and unmanned aerial systems;
- Maintain the long-term viability and positive economic impact of military facilities in North Texas; and

- Carry forward specific recommendations from the 2008 JLUS for Naval Air Station Fort Worth Joint Reserve Base (NAS Fort Worth, JRB) and foster additional partnerships across installations and communities throughout the region.

1.2 Purpose of Existing Conditions Report

To establish a baseline for the broader planning context, an initial step of the *Joining Forces* effort is to analyze current conditions in the study area. The purpose of this Existing Conditions Report is to summarize compatibility issues, trends, available tools, and priorities. Research for this report focuses on:

- Regional and community growth and land use patterns;
- Current military missions and any foreseeable mission change;
- Current land use policy and regulatory measures and ongoing compatibility initiatives; and
- Stakeholder and public input gathered to date.

Findings will inform development of recommendations in subsequent phases of the study.

1.3 Study Area

The study area consists of the major military training facilities and related airspace in North Texas and surrounding communities (See **Table 1** and **Figure 1**). This area encompasses 24,200 square miles, including six installations, two Military Operating Areas (MOAs), and portions of 18 counties and more than 60 cities or census designated communities near military operations. It also stretches across two regional planning areas. The North Central Texas Council of Governments (NCTCOG) covers 16 counties, including three counties with a

major installation (Dallas, Tarrant, and Parker). The Ark-Tex Council of Governments includes Lamar County, the fourth county that hosts a major installation.

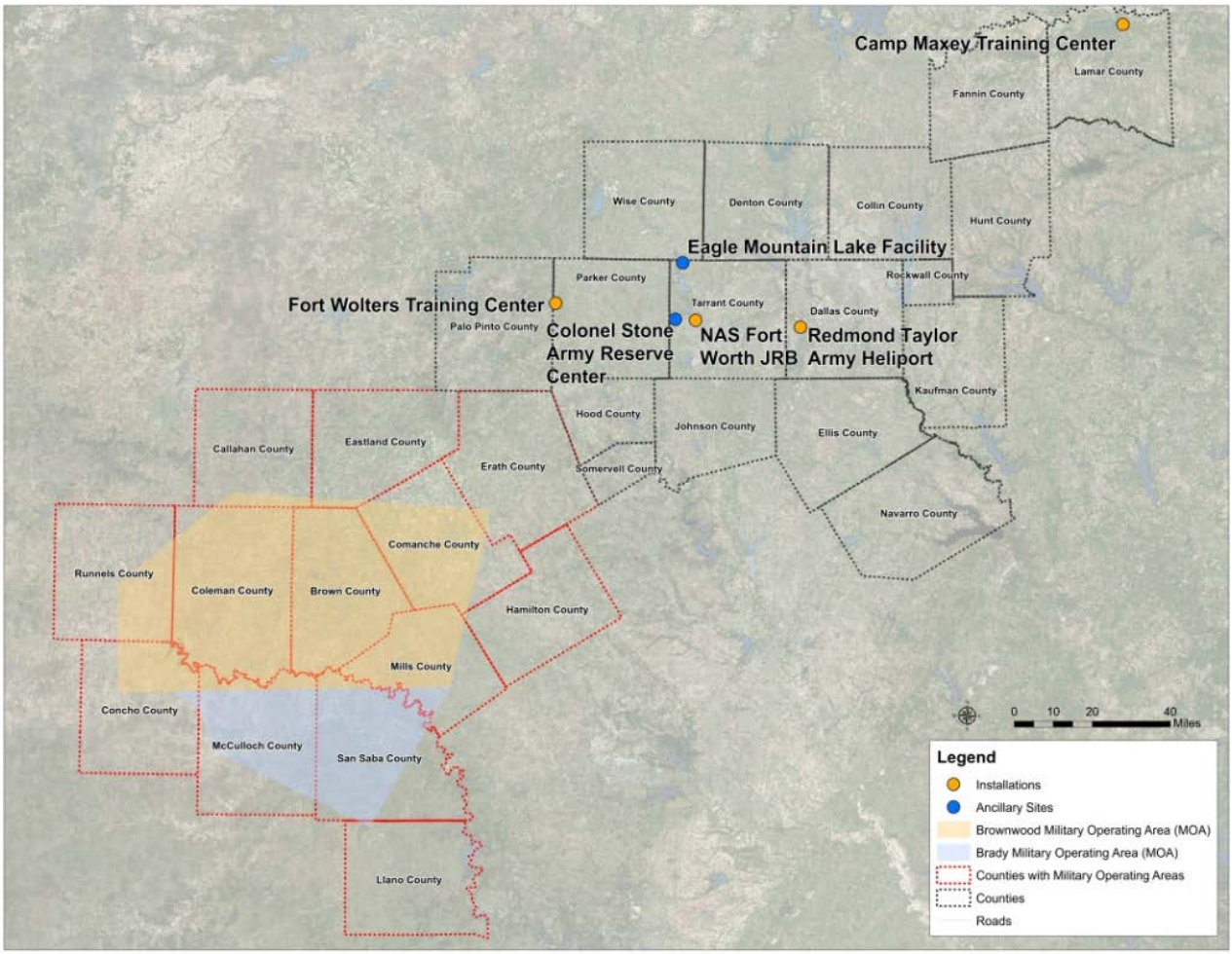
Given the scale of the region, the JLUS process organizes the installations into functional categories based on the intensity of their activities, tenant mix, and operational missions as shown in **Table 1**. The high-intensity installations employ large numbers of full-time active-duty, Reservists, and civilian personnel or serve as active training centers for the Texas Military Forces. The high-intensity installations also manage ancillary sites for training purposes. The remaining facilities (i.e., not high-intensity) include maintenance sites, administrative centers, or training areas with lower impact operations. To focus effort on the most critical areas with the highest risk of encroachment, the study will conduct detailed analyses around high-intensity operations. The public outreach process also emphasizes continued collaboration and the building of partnerships between these active installations and their neighboring communities. Overall, the JLUS document will produce a tailored set of compatibility recommendations to reflect the diversity of the region and its stakeholders.

Table 1. *Joining Forces* Installations and Local Governments

Level of Operations	Installation/MOA	County	Location	Local Governments
High-Intensity Operations	Naval Air Station Fort Worth, Joint Reserve Base	Tarrant	Fort Worth, TX	Cities of Benbrook, Fort Worth, Lake Worth, River Oaks, Sansom Park, Westworth Village, and White Settlement; Tarrant County
	Redmond Taylor Army Heliport	Dallas	Dallas, TX	Cities of Dallas and Grand Prairie
	Fort Wolters Training Center	Palo-Pinto / Parker	Mineral Wells, TX	City of Mineral Wells; Palo Pinto and Parker Counties
	Camp Maxey Training Center	Lamar	Unincorporated Lamar County	City of Paris, Powderly CDP; Lamar County

Level of Operations	Installation/MOA	County	Location	Local Governments
Ancillary Sites	Eagle Mountain Training Center	Tarrant	Pecan Acres Census Designated Place, TX	Pecan Acres Census Designated Place and Tarrant County
	Brownwood and Brady Military Operating Areas	Portions of Brown, Callahan, Coleman, Comanche, Concho, Eastland, Erath, Llano, Hamilton, McCulloch, Mills, Runnels, and San Saba	Brownwood, TX	Portions of Brown, Callahan, Coleman, Comanche, Concho, Eastland, Erath, Llano, Hamilton, McCulloch, Mills, Runnels, and San Saba Counties
Low-Intensity Training/Maintenance Sites	Colonel Stone Army Reserve Center	Tarrant	Fort Worth, TX	City of Fort Worth; Tarrant County

Figure 1. *Joining Forces* Regional Study Area



1.4 Formal Study Partners

NCTCOG received a grant from the Department of Defense (DoD), Office of Economic Adjustment (OEA) to coordinate the efforts of *Joining Forces* participants. To balance multiple community, operational, and mission needs within a large region, NCTCOG formed four Policy Committees, representing interests around each of the high-intensity installations (See **Table 2**). The Committees will guide the study, assisting the planning team in identifying key issues, gathering technical data, evaluating the feasibility of strategies, and developing recommendations. While the Committees will meet regularly to offer strategic direction, *Joining Forces* also seeks to facilitate a collaborative and inclusive process that engages residents, businesses, landowners, community groups, and other stakeholders beyond the list of formal participants.

Table 2. *Joining Forces* Policy Committees

Installation	Stakeholder Representatives
Redmond Taylor Army Heliport	City of Grand Prairie
	City of Dallas
	Redmond Taylor Army Heliport
	Texas Military Department – TX Army National Guard
Fort Wolters Training Center	Palo Pinto County
	City of Mineral Wells
	Fort Wolters
	Mineral Wells/Palo Pinto County Area Growth Council
	Mineral Wells Area Chamber of Commerce
	Natural Resources Conservation Service
	Texas Military Department– TX Army National Guard
	Lake Mineral Wells State Park/Texas Parks & Wildlife

Installation	Stakeholder Representatives
Camp Maxey Training Center	Lamar County
	City of Paris
	Camp Maxey
	Texas Military Department– TX Army National Guard
	Ark-Tex COG
Naval Air Station Fort Worth, Joint Reserve Base	City of Benbrook
	City of Fort Worth
	City of Lake Worth
	City of River Oaks
	City of Sansom Park
	City of Westworth Village
	City of White Settlement
	Tarrant County
	NAS Fort Worth, JRB

2. Regional Profile

2.1 Regional Land Use and Growth Trends

North Texas is a vast mix of urban centers and suburban-style development with smaller, lightly populated communities on the edges of the metropolitan area. The dynamic Dallas-Fort Worth (DFW) core anchors the region, while rural counties define the northern and far western portions of the study area (See **Figure 2**).

While prior growth occurred at the region's center and in proximity to installations such as NAS Fort Worth, JRB and the Redmond Taylor Army Heliport (RTAHP), forecasts indicate a continued expansion of development throughout the NCTCOG counties. According to the Census Bureau, the region was the second fastest-growing metro in the United States from July 2014 to July 2015, trailing only Houston.[1] The region was also second among America's major metros in new housing starts in 2015, behind New York. NCTCOG anticipates that the region will continue its rapid growth, with a population increase of 64 percent over the next two decades. If trends hold, the 12 counties that constitute the NCTCOG Metropolitan Planning Area (Collin, Dallas, Denton, Ellis, Hood, Hunt, Johnson, Kaufman, Parker, Rockwall, Tarrant, and Wise) should add more than 4 million people, bringing the 2040 population to approximately 11 million.

People and development do not spread evenly across the study region (See **Table 3**). The most densely populated is Dallas County with more than four people for each acre of land. In contrast, Palo Pinto County on the western edge of the region has 21 acres of land for every resident. Growth patterns serve as an indicator of future compatibility risk. Growth in core and

[1] The Explosive Northern Growth of Metro Dallas, Forbes, Jul 1, 2016

inner tier counties, especially in suburbs north of the City of Dallas and to the west near Fort Worth, should be robust in the years ahead. Current trends should not significantly alter the predominantly rural character of counties to the far north and southwest. As described more fully in the individual city profiles in **Section 9**, the centrally located communities surrounding NAS Fort Worth, JRB and RTAHP are primarily built out, while land near Fort Wolters and Camp Maxey remains mostly rural. The particularly strong growth in Parker and Tarrant Counties, however, reflects both infill development opportunities and new development that could draw increased activity near military installations. The JLUS framework will help communities evaluate these growth trajectories and implement appropriate land use and communication tools in advance of development.

Figure 2. Urbanized Areas, *Joining Forces* Region

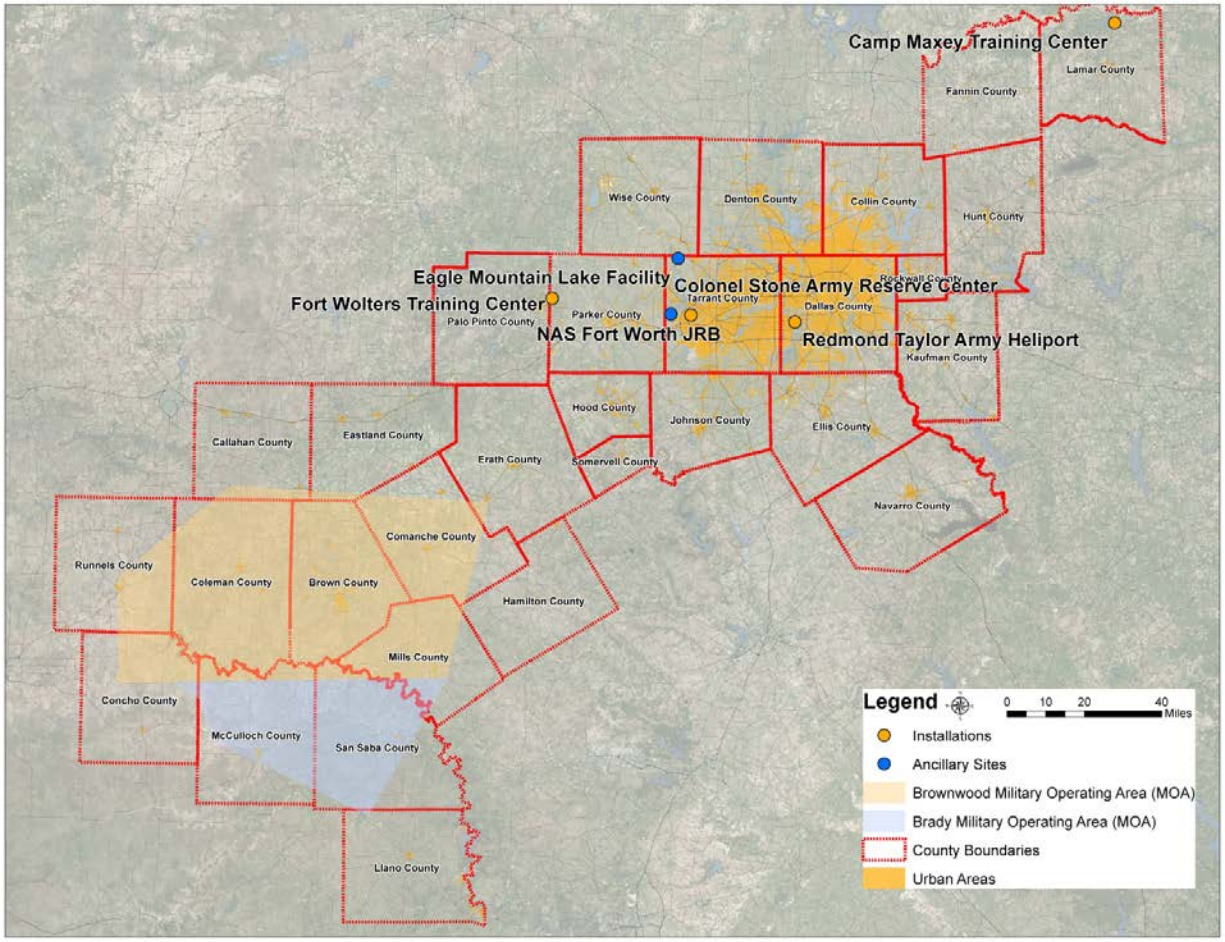


Table 3. Population Trends in the *Joining Forces* Region

County	2010	2040	% Change
Collin*	782,341	1,560,421	99.5%
Dallas*	2,368,139	3,357,469	41.8%
Denton*	662,614	1,241,681	87.4%
Ellis*	149,610	283,898	89.8%
Hood*	51,182	81,578	59.4%
Hunt*	86,129	131,022	52.1%
Johnson*	150,934	252,521	67.3%
Kaufman*	103,350	210,097	103.3%
Parker*	116,927	195,286	67.0%
Rockwall*	78,337	166,357	112.4%
Tarrant*	1,809,034	3,094,649	71.1%
Wise*	59,127	101,865	72.3%
Brown**	38,106	41,184	8.08%
Callahan**	13,544	15,196	12.20%
Coleman**	8,895	9,063	1.89%
Comanche**	13,974	15,640	11.92%
Concho**	4,087	4,322	5.75%
Eastland**	18,583	19,830	6.71%
Erath**	37,890	47,464	25.27%
Fannin**	33,915	39,458	16.34%
Hamilton**	8,517	8,593	0.89%
Lamar **	49,793	56,265	13.00%
Llano**	19,307	18,654	-3.38%
McCulloch**	8,283	8,949	8.04%
Mills**	4,936	5,352	8.43%
Palo Pinto**	28,103	31,209	11.1%

County	2010	2040	% Change
Runnels**	10,501	11,140	6.09%
San Saba**	6,131	6,289	2.58%
TOTAL	**6,722,289**	**11,015,452**	**63.9%**

Source: *2010 data obtained from the U.S. Census Bureau and 2040 forecasts obtained from NCTCOG Mobility 2040; **2010 data obtained from the U.S. Census Bureau and forecasts obtained from the Texas State Demographer, Population Forecasts 2016

2.2 Regional Economic Profile

The DFW region is one of the most diverse and dynamic economies in the nation. Significant industry clusters include aviation/aerospace, finance, healthcare, high technology, logistics, and manufacturing. Military-related facilities are also major contributors to the region's solid economic base. Installations provide direct jobs to enlisted personnel, contractors, civilians, and support staff. Additionally, personnel boost local economies by spending wages on goods and services produced in their communities. Along with active personnel, veterans compose a substantial percentage of the population, making up 6.5 percent of civilians age 18 or older in the 12-county DFW region and 9.8 percent of civilians age 18 or older in Lamar County, home of Camp Maxey. Approximately 210,000 retirees in the region access NAS Fort Worth, JRB for a variety of services.

Regionally, NAS Fort Worth, JRB generates an estimated $6.6 billion in goods and services and $2.7 billion in post-income-tax personal income.[2] The installation supports jobs for 17,466 people, and provides direct and indirect employment to 47,256 workers. The presence of the base and nearby Lockheed Martin has elevated the region to a top aviation and aerospace hub. From 2004 through 2014, employment in Tarrant County attributed to the military increased

[2] Naval Air Station Fort Worth Joint Reserve Base Estimated Contribution to the Texas Economy, 2015

by six percent. Although no comparable economic data is available for Texas Army National Guard facilities, Camp Maxey and Fort Wolters both saw a substantial increase in use of training facilities between 2012 and 2014.

The Texas military footprint is among the largest in the United States. According to the latest analysis from the Texas Comptroller, the state's 15 major DoD installations generate $136 billion in economic activity, support more than 800,000 jobs, and create $48 billion in personal income annually.[3] The impact of Texas military installations ranked ahead of agriculture and just behind energy as the state's biggest economic drivers.

2.3 Regional Energy Infrastructure

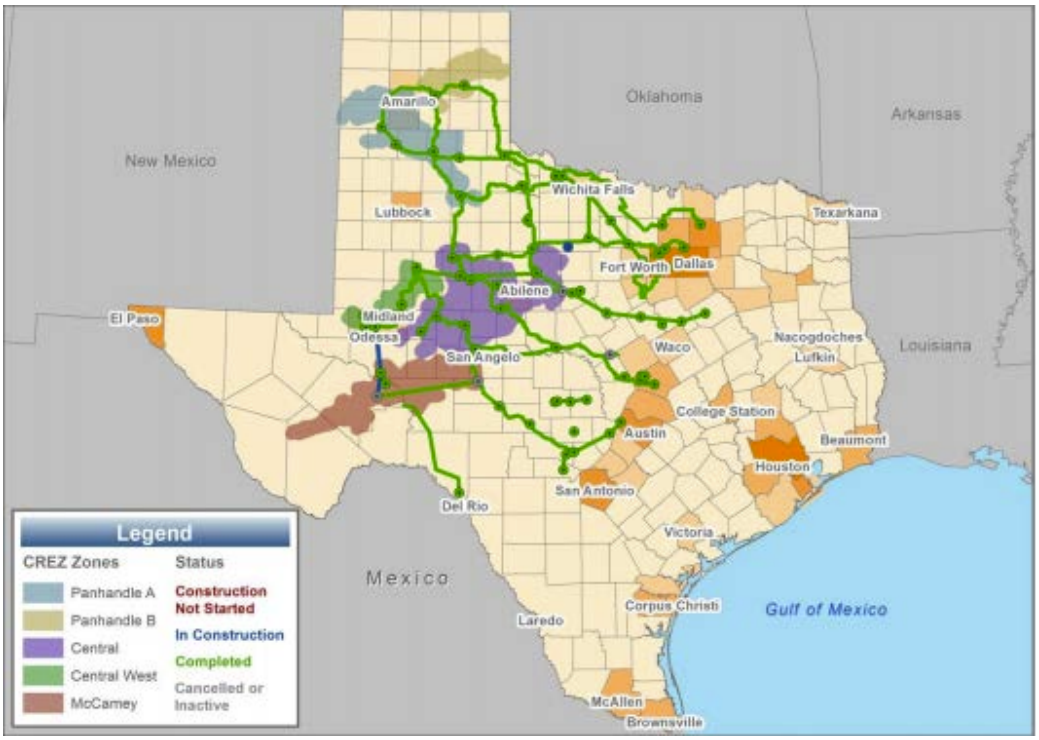
Wind generation claims a rapidly growing share of the Texas energy sector. Texas produced 10 percent of its in-state electricity from wind in 2015 and industry forecasts suggest that this percentage could rise to 37 percent by 2030.[4] Growth in wind-powered electricity is the result of the state's naturally windy conditions combined with incentives and strategic infrastructure investments. In 2005, the Public Utility Commission of Texas established Competitive Renewable Energy Zones to connect remote wind resources in the west to the electric grid. The $7 billion project includes construction of 3,600 miles of transmission lines and network upgrades to substations, switches, and terminals. A 2,500-mile 345-kilovolt grid will bring 18,500 megawatts (MW) of wind energy to consumers in DFW and Austin (See **Figure 3**).

[3] U.S. Military Installations and the Texas Economy, http://texasahead.org/economic-data/military/

[4] Wind energy technology booms, increases role in Texas electricity power

Wind resource potential based on average wind speed is highest along the coast near Corpus Christi, the Panhandle region, and areas west of DFW near Abilene[5]. However, renewable energy infrastructure could begin to spread east with changing technologies and demands. Facebook, for example, is powering its new data center in Fort Worth with energy generated solely by a 200-MW wind farm in Clay County about 90 miles west of the site.

Figure 3. Competitive Renewable Energy Zones



Source: Public Utility Commission of Texas

Energy production and transmission infrastructure, particularly tall structures such as wind turbines and transmission-line towers, can pose a collision hazard to military aircraft

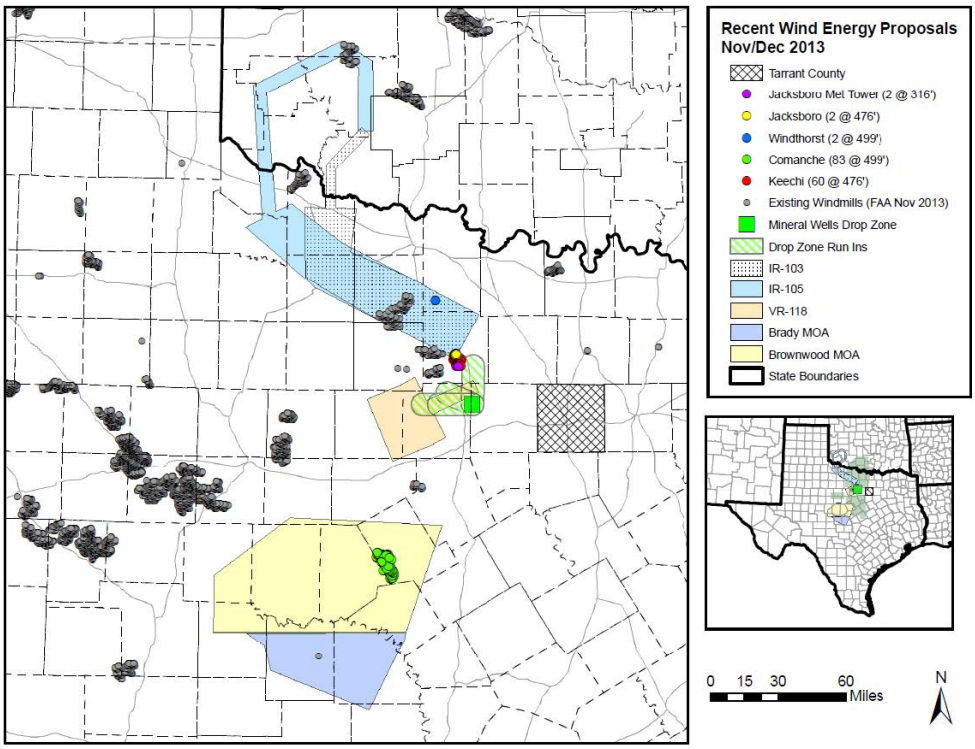
[5] Texas Wind Resource Map and Potential Wind Capacity, http://apps2.eere.energy.gov/wind/windexchange/wind_resource_maps.asp?stateab=tx

operations, especially in designated low-altitude Military Training Routes (MTRs). Wind turbines can also cause "clutter" on sensitive radars used by the DoD and other agencies, such as the Federal Aviation Administration (FAA). The resulting interference can cause radar to lose or misidentify aircraft targets. As described in **Section 4**, the DoD has established a process for evaluating the mission compatibility of proposed energy projects. The presence of renewable energy infrastructure is particularly relevant for NAS Fort Worth, JRB aircraft operating within MTRs and the training airspace defined by the MOAs. **Figure 4** shows the overlap of existing and recently proposed wind energy infrastructure and aviation-related training areas. The Electric Reliability Council of Texas (ERCOT) plays a major role in managing the flow of 90 percent of the state's electric power.

Gas wells are another type of energy-related infrastructure that can create aviation hazards in proximity to military airfields. Personnel at RTAHP have noted the presence of gas wells at the Eagle Mountain Training Area and energy developers have proposed wells near other *Joining Forces* installations. Although offcials denied those proposals, they indicate that the area is suitable for gas wells, and there may be additional proposals in the future.

Military representatives have been engaging ERCOT in exploring notification processes to coordinate infrastructure decisions that could affect aviation safety. As of 2016, the ERCOT *Planning Guide* contains a Declaration of Department of Defense Notification for an Interconnecting Entity (IE). Any IE seeking a study for interconnection to the ERCOT system must submit a declaration certifying that it has notified the DoD Siting Clearinghouse of the proposed generation resource and requested an informal or formal review or demonstrate that the proposed source is not required to provide notice.

Figure 4. Wind Energy in Proximity to Airspace Training, 2013



Source: NAS Fort Worth, JRB

2.4 Regional Environmental Resources

The diverse array of natural, cultural, open space and recreational resources in North Texas forms part of the unique identity and high quality of life that defines the region. These assets also pose challenges and opportunities for nearby active military operations. The presence of sensitive resources, such as threatened and endangered species or cultural and archaeological sites, can require military installations to implement management and protection measures that restrict the use of land for training purposes. As described in detail later in this section, the proximity of lakes and rivers can produce issues such as flooding that directly interfere with operations. Nearby open space, working lands, parks, and critical habitat, however, can also

highlight opportunities for highly effective conservation partnerships to preserve natural buffers around military installations (See **Section 4**).

2.4.1 Conservation Resources

The portion of the *Joining Forces* study area that is west of Dallas falls into the Cross Timbers and Prairies Ecological Region, which spreads 26,000 square miles across North Central Texas. The Nature Conservancy has identified several Priority Conservation Areas where conservation efforts would most effectively protect species and ecological systems in this area, including the Dyksterhuis Woodlands and Prairies, Fort Worth Prairies, Mineral Wells Cross Timbers, and Dogwood Cuesta. The Texas Parks & Wildlife Department has also established a Cross Timbers Wildlife District that encompasses Tarrant, Parker, and Palo Pinto Counties. The purpose of the district is to manage and conserve the natural and cultural resources of the area.

While tall grass prairie once covered the parts of the Cross Timbers and Prairies region, ranching, agriculture, and eventually urban development have degraded wildlife and habitat resources in the area, particularly around Fort Worth. Today, the East Cross Timbers sub-region has few remaining large tracts of undisturbed woodlands, making it one of the most fragmented vegetative regions in Texas. Farther west, the West Cross Timbers sub-region is relatively intact, featuring a hilly terrain, open grasslands, and brushy rangelands. Ranch holdings in Palo Pinto County, for example, are typically 300 to 400 acres in size, supporting livestock and croplands planted for grazing. Much of the sub-region contains habitat that supports populations of white-tailed deer and other wildlife species, creating prime hunting land. Fragmentation of wildlife habitat is increasing in the eastern counties of the West Cross Timbers, such as Parker County, where landowners are selling and subdividing larger land holdings for small home-building sites, farms, and ranchettes.

Source: Audubon Field Guide

North Texas is home to several endangered species, including federally listed bird species such as the black-capped vireo and golden-cheeked warbler. The golden-cheeked warbler is a small, migratory songbird, often known as the goldfinch of Texas. It lives in 33 counties in central and southern Texas, covering an area roughly east of Fort Worth and Austin and west toward Big Bend National Park. The warbler's natural habitat includes tall forests of juniper and hardwood trees. The counties within the Brownwood and the Brady MOAs and Fort Wolters contain warbler habitat.

The black-capped vireo is a small and endangered bird that has a habitat zone west of Fort Worth with proximity to *Joining Forces* military installations. Similar to the golden-cheeked warbler, habitat for the vireos includes hardwoods like oak. However, the birds also can be found in less-dense wooded areas and open grassy areas.

Biologists previously sighted the federally endangered American burying beetle (ABB) in the Camp Maxey area. The presence of this endangered species had placed much of the acreage of the installation under environmental restrictions. However, in 2015, the U.S. Fish & Wildlife Service issued a new Biological Opinion that found no designated critical habitat and declared that TXARNG's military training activities at Camp Maxey and the implementation of its Integrated Natural Resources Management Plan are unlikely to jeopardize the ABB. Because of these findings, the U.S. Fish & Wildlife Service has lifted training and maintenance restrictions on Camp Maxey but calls for continued monitoring of the species in the area.

Numerous open spaces, parks, and major water bodies have adjacency to *Joining Forces* military operations. Mountain Creek Lake sits immediately to the southeast of the RTAHP in the City of Dallas. Similarly, Lake Worth bounds a portion of NAS Fort Worth, JRB on its northern

perimeter. The 640-acre Lake Mineral Wells State Park and Trailway is just south of Fort Wolters. The Pat Mayse Lake reservoir and Wildlife Management Area lie to the north of Camp Maxey in Lamar County. Nearby lakes and open spaces act as natural buffers around installations but can also increase public access to military lands or training areas, attract recreational activity near training, or cause development pressure on nearby privately held lands. Open rangelands are also more prone to wildfires, particularly during drought conditions. In 2011, the Possum Kingdom fire burned 6,500 acres and destroyed 39 homes in Palo Pinto County. Although an investigation determined that military training was not the cause of this blaze, the use of vehicles, equipment, and ordnance, in general, contributes to the higher risk of wildfires.

Various public agencies and non-profit organizations work to protect open space, working lands, habitat, and species in North Texas through conservation easements, technical and financial assistance to landowners, policy initiatives, and the management of land resources. The Texas Parks & Wildlife Department (TPWD), the Natural Resources Conservation Service (NRCS), the Nature Conservancy, the Trust for Public Land and the Compatible Lands Foundation have an active presence in the *Joining Forces* region. The TPWD, NRCS, the Noble Foundation, Texas AgriLife Extension Service, and the Grazing Lands Conservation Initiative in Texas have participated in wildfire post-recovery planning in Palo Pinto County.

Figures 5 through **8** show major environmental features in the *Joining Forces* region. **Table 4** lists the environmental conditions displayed on the maps. The presence of these sensitive resources near installations offers opportunities to explore conservation partnerships to create buffers.

Table 4. Major Environmental Features in *Joining Forces* Region

Factor	Description	Data source
Historic points, sites, districts, or cemeteries	These sites include those with national and/or state historic designations.	Texas Historical Commission
Closed landfills	Permitted and unauthorized sites were identified by Texas State University for the Texas Commission on Environmental Quality.	NCTCOG
Existing landfills	These sites are identified by NCTCOG land use data.	NCTCOG
Streams	These sites include all feature types identified by the medium resolution dataset from the National Hydrography Dataset.	National Hydrography Dataset
Impaired streams and lakes	These sites include Category 5 impaired waterbodies—those that don't meet standards for water quality or at least one of their designated uses is threatened by pollution.	Texas Commission on Environmental Quality
Lakes	These data include major lakes.	NCTCOG and National Hydrography Dataset
Wetlands and wet prairie	Three datasets were combined to provide the most inclusive data possible.	National Wetlands Inventory, National Land Cover Database 2011, and Ecological Mapping Systems of Texas (Texas Parks &

Factor	Description	Data source
		Wildlife Department)
FEMA flood zones	These locations include 100-year flood zones.	Federal Emergency Management Agency
Parks or natural areas	These areas are natural areas or designated local, state, or national parks that are potentially undevelopable.	NCTCOG and National Land Cover Database
TNC Priority Conservation Areas	These areas have been identified by The Nature Conservancy as priority areas to protect and preserve species and ecological systems.	The Nature Conservancy
Watershed Protection Plans	These locations include existing and planned watershed protection plans for non-point source water pollution.	Texas Commission on Environmental Quality
USGS Protected Areas Database	This inventory includes public parks and protected open space. Protected areas that duplicated other layers were not included.	U.S. Geological Survey Gap Analysis Program
Brownfields	Contaminants, hazardous substances, or pollutants may be located at these sites.	Environmental Protection Agency Region 6
TMDL Bacteria Implementation Plan	The Greater Trinity River Bacteria TMDL Implementation Plan seeks to reduce bacteria loading in river segments and tributaries in the plan area.	NCTCOG
Conservation easements	These locations have been voluntarily submitted to the National Conservation Easement Database, which does not include all conservation easements.	National Conservation Easement Database

Factor	Description	Data source
Wildlife Management Areas	These protected areas preserve habitats and wildlife that are typical of ecoregions in Texas.	Texas Parks & Wildlife Department
Significant Stream Segments	These streams segments have been identified as having unique ecological value.	Texas Parks & Wildlife Department
Solid waste sites	Municipal solid waste sites include registered and permitted landfills and associated sites.	Texas Commission on Environmental Quality

Figure 5. Environmental Features around Camp Maxey

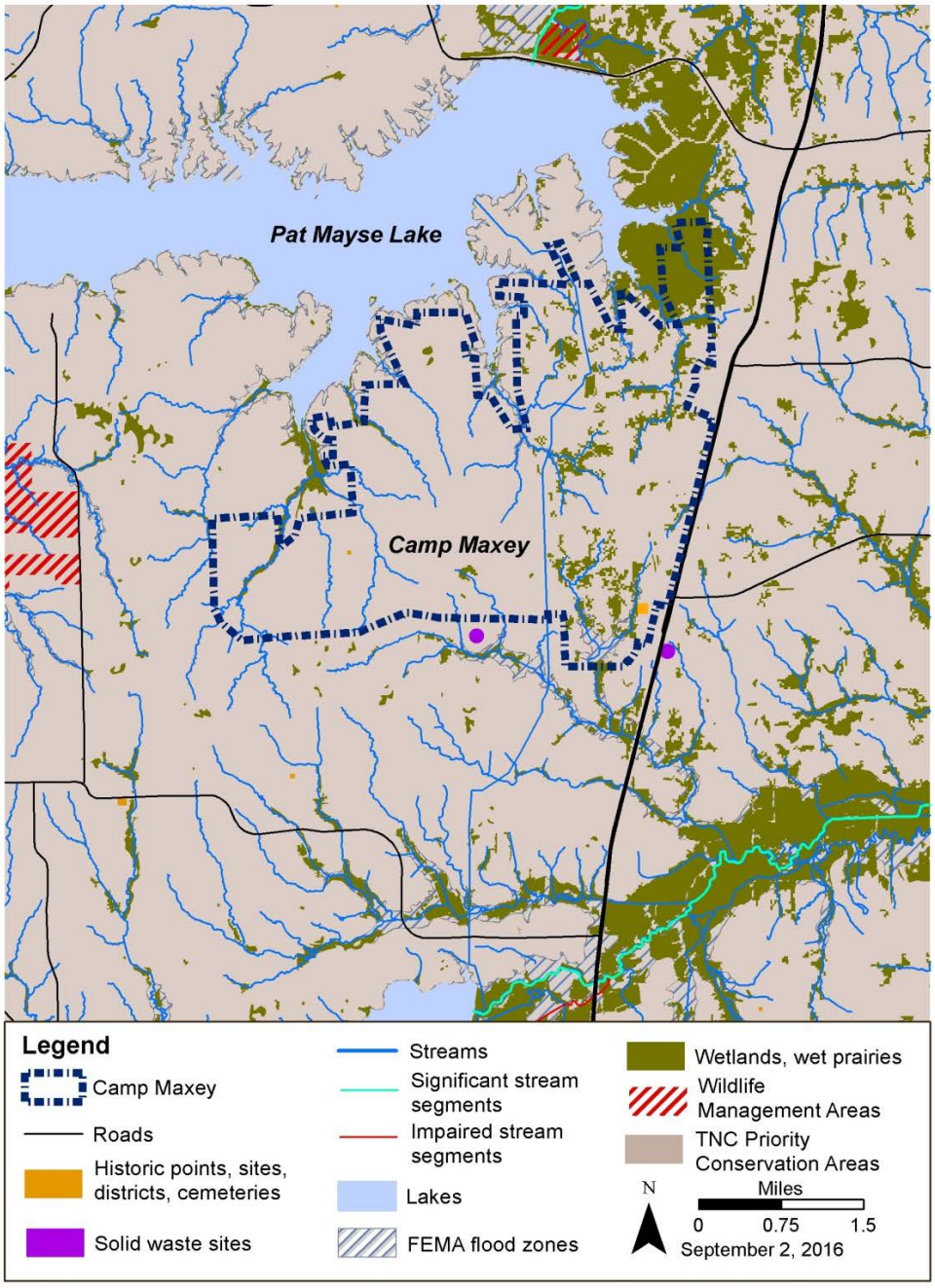


Figure 6. Environmental Features around Fort Wolters

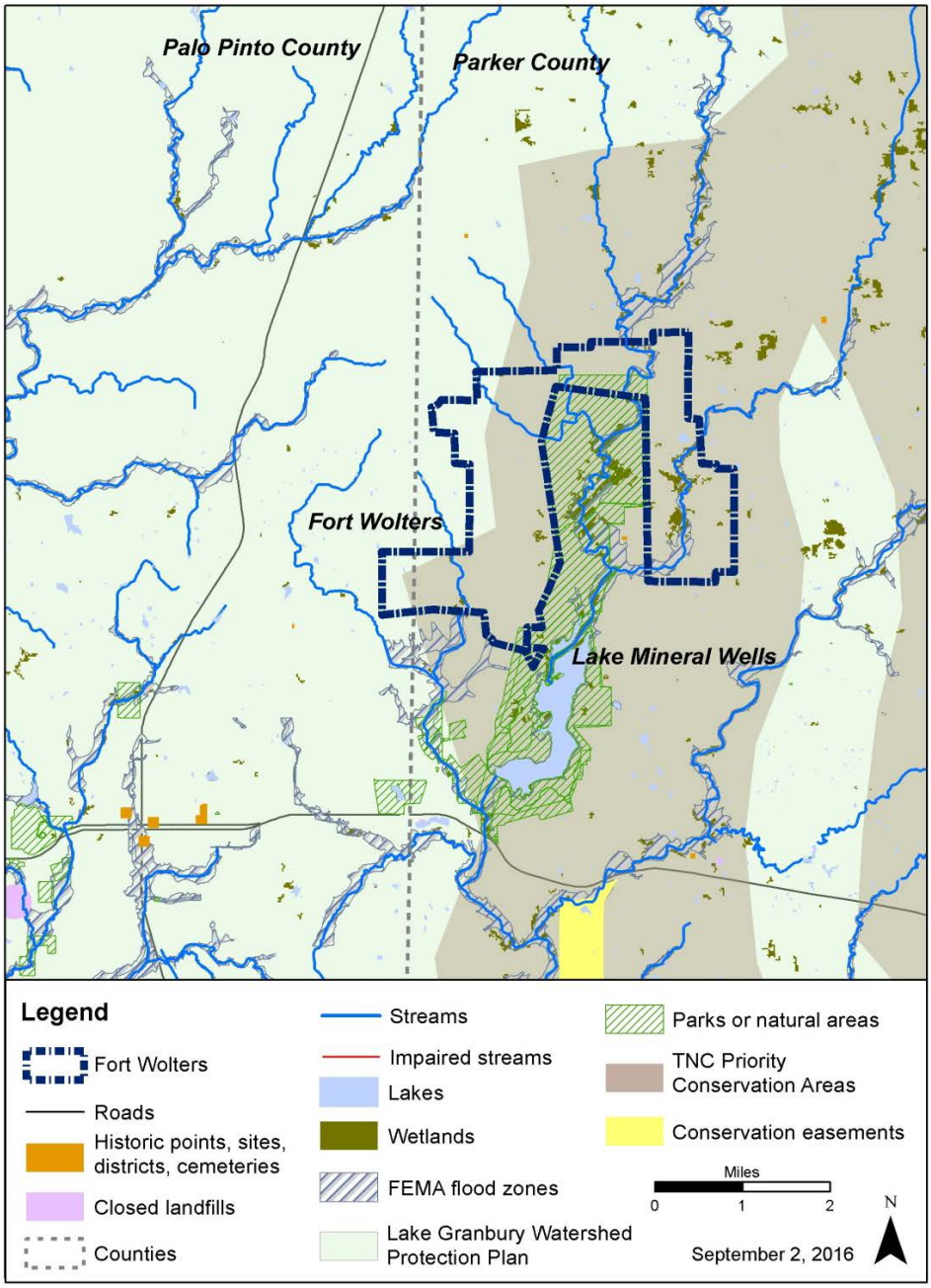


Figure 7. Environmental Features around NAS Fort Worth, JRB

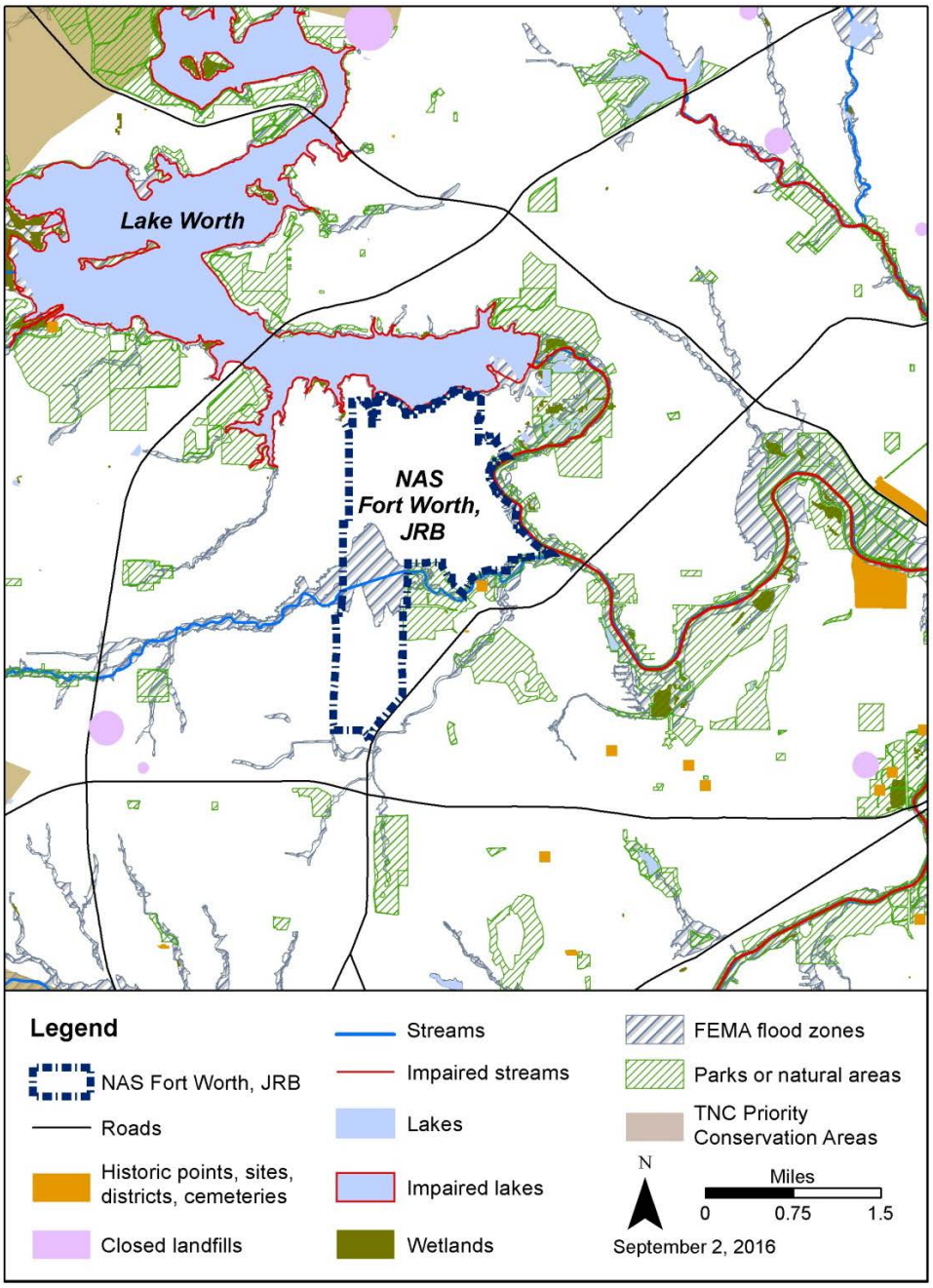
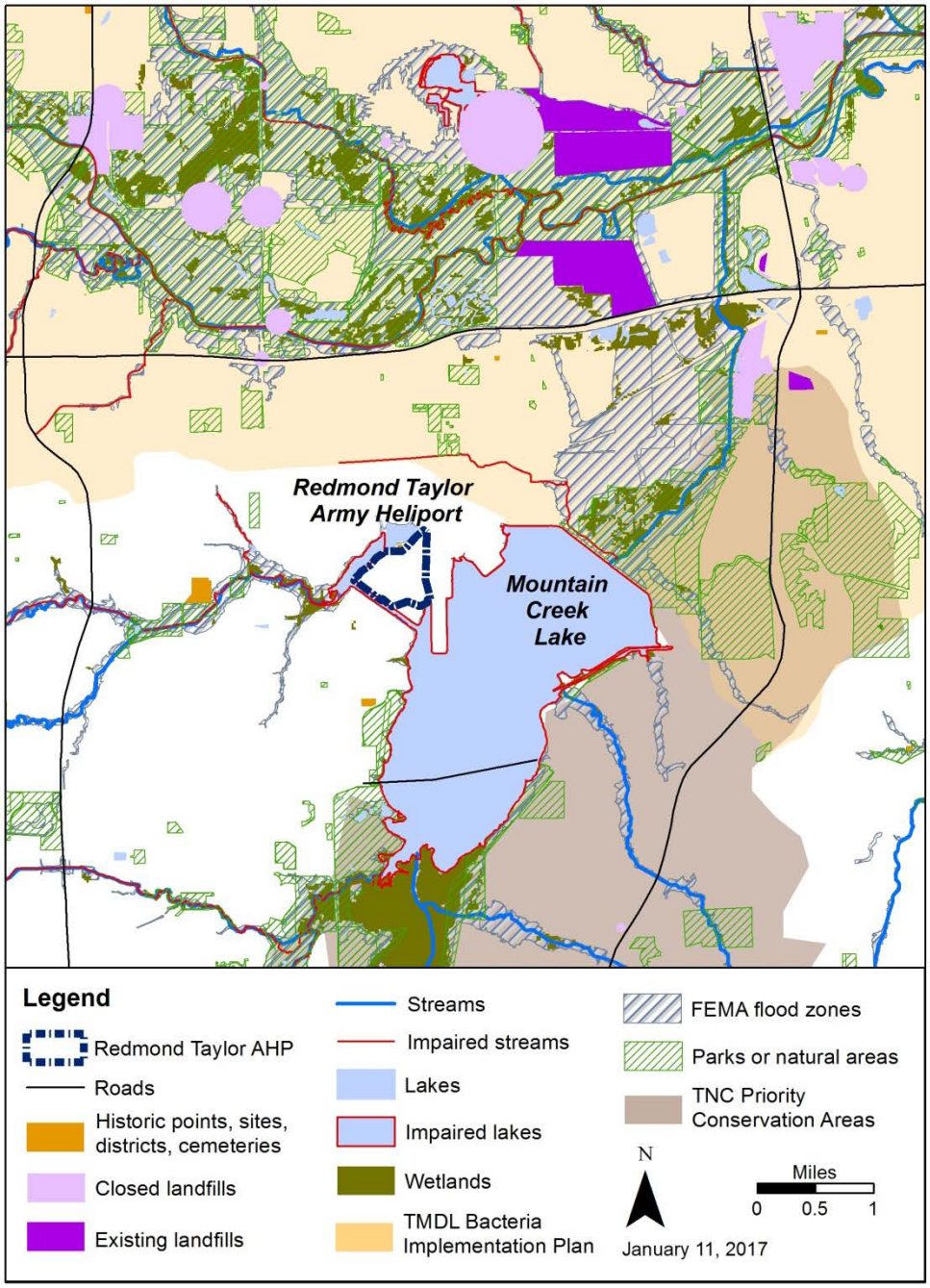


Figure 8. Environmental Features around Redmond Taylor Army Heliport

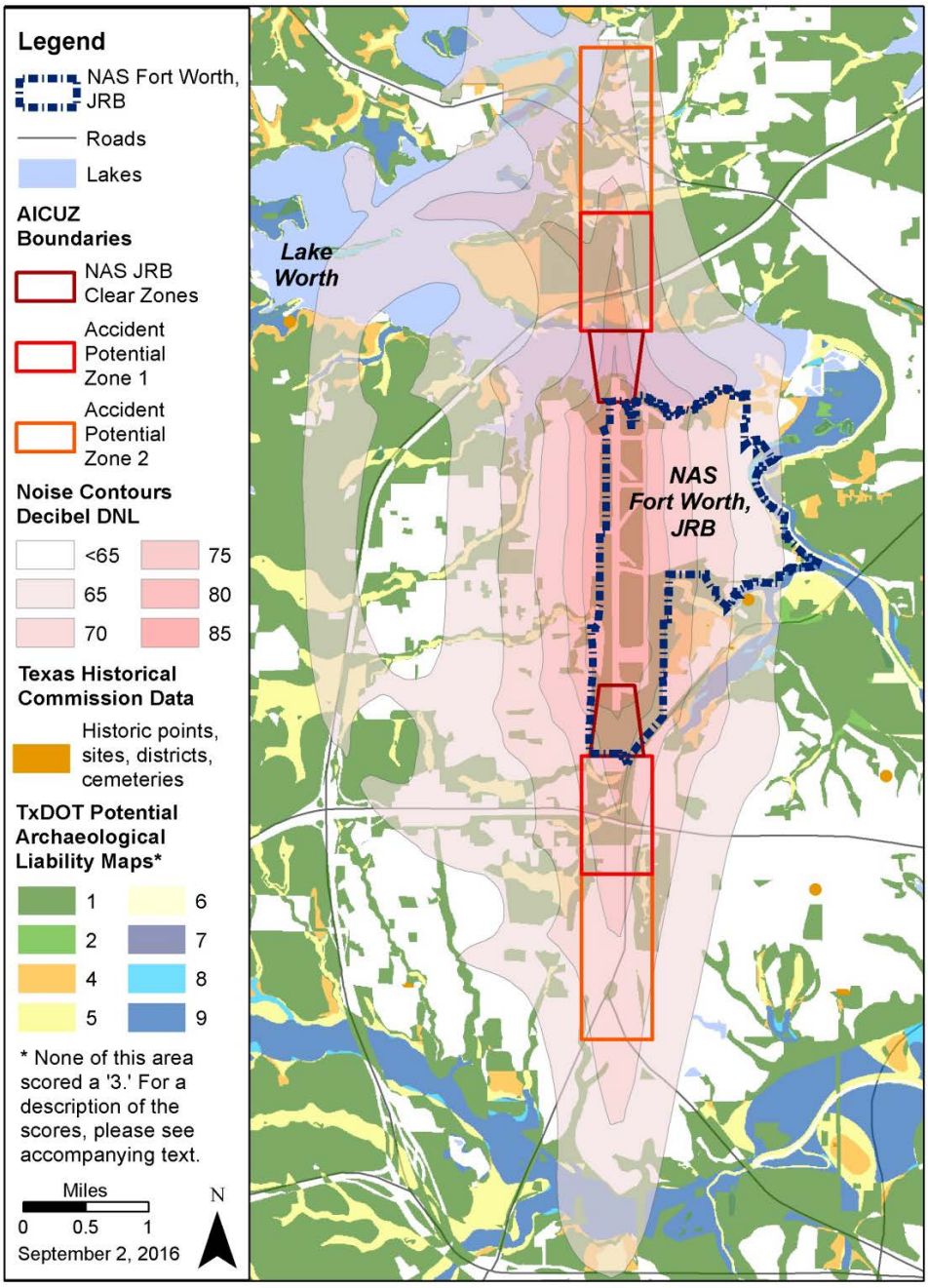


The presence or potential presence of archaeological resources in an area can also limit military and other activities, or place restrictions on them. **Figure 9** shows the results of a study around NAS Fort Worth, JRB to predict the relative likelihood that a location will contain prehistoric sites eligible for the National Register of Historic Places and thus require mitigation measures. Aggregate archaeological liability predictive scores represent the likelihood for surface-level prehistoric sites and deep prehistoric sites. **Table 5** describes the aggregate scores.

Table 5. Potential Archaeological Liability Predictive Scores

Aggregate Score	Relative Likelihood for Surface-Level Prehistoric Sites	Relative Likelihood for Deep Prehistoric Sites
No score	Negligible	Negligible
1	Low	Low
2	Low	Moderate
3	Low	High
4	Moderate	Low
5	Moderate	Moderate
6	Moderate	High
7	High	Low
8	High	Moderate
9	High	High

Figure 9. Potential for Archaeological Resources, NAS Fort Worth, JRB



2.4.2 Watershed Resources

Bodies of water surround NAS Fort Worth, JRB with Lake Worth on the north and the West Fork of the Trinity River on the east. Farmers Branch Creek flows through the installation. Two large circular box culverts connect 7.2 square miles of contributing area, four square miles of which are within the City of White Settlement, which links to the remainder of the overall basin area of 11.4 square miles. Construction of these box culverts is assumed to pre-date the 2009 Federal Emergency Management Agency (FEMA) map (Map Number of 48439C0170K, Revised September 25, 2009). A levee on the east side of the West Fork of the Trinity River protects portions of the River Oaks community from a 100-year flood event.

The communities around NAS Fort Worth, JRB fall within the Lower West Fork Trinity Watershed. This watershed encompasses 55 communities, covering approximately 1,513 square miles and portions of Dallas, Ellis, Hood, Johnson, Parker, Tarrant and Wise Counties. According to FEMA, the Lower West Fork Trinity Watershed has experienced a high number of disaster declarations in the last 60 years. The Farmers Branch Creek sub-Watershed contains the Cities of White Settlement, Fort Worth, River Oaks, and Westover Hills.

A specific focus of *Joining Forces* is to identify best practices to reduce the risk of flooding in areas near NAS Fort Worth JRB. Participants ranked drainage and flooding as the highest priority issue at the initial *Joining Forces* public meeting held in River Oaks in August 2016 (See **Section 11**). Attendees in particular noted flooding issues along the State Highway 183 corridor near Roberts Cut Off Road and along State Highway 199. NAS Fort Worth JRB previously experienced flooding on the runway. Base personnel have taken proactive measures with the community to ensure flooding is not a current issue on the installation.

2.4.3 FEMA Flood Zones

Figure 10 displays FEMA Flood Insurance Risk Zones in the NAS Fort Worth, JRB area. The zones indicate areas of high risk for flooding with Zone A representing an area with a one percent annual chance of flooding and a 26 percent chance of flooding over the life of a 30-year mortgage. Zone AE, which includes a portion of the base, indicates that there has been a prior study of flooding in the area.

Figure 10. FEMA Flood Zones, NAS Fort Worth, JRB

2.4.4 Existing Stormwater Planning Studies

Flooding has been an ongoing challenge for the region, prompting numerous studies and floodplain management activities. NCTCOG is a FEMA Cooperating Technical Partner (CTP), allowing collaboration with FEMA to maintain current flood hazard information. In 2013, FEMA and NCTCOG began the Discovery process for the Lower West Fork Trinity Watershed. The purpose of the effort was to gather information about local flood risk, flood hazards, mitigation plans, mitigation activities, flooding history, development plans, and floodplain management to help communities identify and protect areas of risk. The resulting study rated the Farmers Branch Creek sub-Watershed as high risk for flooding. FEMA will use the prioritization rankings list to determine targeted action items, potential projects, and multi-year flood risk project plans within the Lower West Fork Trinity Watershed. The report also lists flood risk identification as a potential project for Farmers Branch-West Fork Trinity. There are also a number of hazard mitigation plans throughout the Lower West Fork Trinity Watershed, including the City of Benbrook and the City of Fort Worth (the plan covers the communities of Lake Worth, River Oaks, Sansom Park, Westover Hills, Westworth Village, White Settlement, and unincorporated Tarrant County).

Previous NCTCOG corridor master plan efforts, specifically State Highway 183 (River Oaks Boulevard) and State Highway 199 (Jacksboro Highway) have assessed localized flooding issues. The drainage assessment for the SH 199 Corridor Master Plan studied the corridor running NW to SE, just NE of NAS Fort Worth, JRB along the banks of the West Fork of the Trinity River, and then crossing near the Panther Island Bypass Channel, and Clear Fork Trinity River. It identifies surface drainage along the SH 199 corridor as poorly defined with inadequate drainage collection, minimal storm drain inlets, and insufficient upstream and on-system capture areas, which may flood the roads. The study detailed 14 outfalls, which have varying capacity from <2-year frequency to 100-year frequency, and many of which contained

silt. Two creeks were identified: the Menefee Creek (647 acres) – 5-year Capacity and the WF-5 tributary (473 acres) – 2-year capacity. These creeks will see flooding during large events along SH 199 at the confluence of Menefee Creek and Stream WF-5, and where SH 199 crosses the unnamed creek. Three large bridges are along SH 199: West Fork of Trinity River, Panther Island Bypass Channel, and Clear Fork of Trinity River, which all convey the 100-year floods.

Comments collected from public meetings in River Oaks indicate that several locations along SH 183 are also prone to flooding and that there are issues regarding the sizing of stormwater facilities. Currently, the corridor is characterized by wide swaths of impervious cover, consisting of roadway pavement and parking areas, which limit infiltration of stormwater and generate both high volumes of stormwater runoff and high loadings of stormwater pollutants. In addition, in certain locations, box culverts or storm sewers crossing under River Oaks Boulevard may be undersized, limiting the conveyance of water under the roadway and causing elevated water surface elevations on the upstream side of the roadway that may contribute to both roadway and structural flooding during severe rain events. Existing internal drainage along the corridor typically consists of incised roadside or median ditches, connected across intersections and driveways by culverts.

As a result, the SH183 Corridor Master Plan recommended that immediate short-term solutions from the Texas Department of Transportation would be necessary, including re-grading ditches and cleaning out culverts along the highway. Long-term solutions for flooding in River Oaks include a regional drainage and hydrology study and preliminary engineering to improved facilities.

3. Federal, State, and Regional Policy Context for Compatibility

3.1 Federal Initiatives

DoD entities have a variety of planning, financing, and communication mechanisms available to reduce the impacts of operational activities and coordinate planning with surrounding communities. While some of these measures are currently in place within the *Joining Forces* region, gaps in the current implementation of compatibility tools highlight opportunities for JLUS recommendations.

3.1.1 Joint Land Use Study

In 1985, the DoD initiated the JLUS program to create a community-based framework for compatible land use planning around military installations. The DoD's OEA funded *Joining Forces* as part of this program. As of 2015, 120 defense communities across the United States have completed a JLUS. The communities around NAS Fort Worth, JRB conducted a JLUS in 2008, laying the foundation for this current effort (See Section **3.4.3**).

3.1.2 AICUZ and Encroachment Action Plan

The DoD established the Air Installation Compatible Use Zone (AICUZ) program to define areas of high noise and accident potential and recommend compatible land uses. Using accident data from all military airfields, the AICUZ identifies three zones with a higher statistical risk of an aircraft accident: the Clear Zone (CZ), Accident Potential Zone I (APZ I), and Accident Potential Zone II (APZ II). These zones extend from each end of the runway. The probability of an

incident is highest in the CZ and declines with distance from the runway in the APZ I and APZ II.

To depict the noise impacts of aircraft, the AICUZ expresses average decibel levels over a 24-hour period (day-night average sound level or DNL). Generally, average noise exposure of 65 decibels or higher can cause conflicts with noise-sensitive uses, such as housing or schools. **Figure 11** shows air safety zones and noise contours around NAS Fort Worth, JRB. AICUZ land use guidelines promote compatibility by discouraging people-intensive and noise-sensitive development in areas with exposure to higher safety risks or noise. It should be noted that, while the AICUZ identifies zones with a higher likelihood of impact, noise or aircraft incidents could occur in other areas.

The Navy has also developed an Encroachment Action Plan (EAP) process to address encroachment challenges around Navy installations and ranges. The EAP is an internal Navy tool that identifies factors limiting operational capabilities and establishes action steps and partnering strategies to reduce conflicts. NAS Fort Worth, JRB has prepared an EAP.

3.1.3 Readiness and Environmental Protection Integration

The DoD's Readiness and Environmental Protection Integration (REPI) program reduces the risk of encroachment by authorizing the Military Services (Army, Navy, Marine Corps, and Air Force) to enter into agreements with eligible entities, such as local governments, non-governmental organizations, and willing land owners, to secure conservation easements on property with conservation value near a military installation or military airspace. The agreements enable organizations to acquire, on a cost-shared basis, development interests in the properties of voluntary sellers. The property owner typically continues to hold the title for the land, but receives monetary compensation and tax breaks to maintain the encumbered

property in a highly limited use that preserves habitat and other sensitive environmental resources.

All REPI partnerships require an agreement between the military and an eligible entity, such as a state or local government or private conservation organization, cost sharing between the military and a partner to acquire a land interest or easement, voluntary participation by the landowner, and an assurance that the protected land maintains compatible land use or habitat preservation.

The Army implements REPI authority through its Army Compatible Use Buffers (ACUB) program. The Navy develops an Encroachment Partnering program as a key component of its overall Encroachment Management Program. Installations identify mission priorities, submit projects for funding, identify partners and willing sellers, establish and maintain partner agreements, conduct transactions, maintain real property interests, and report accomplishments to the DoD. To date, Fort Bliss, Fort Hood, Joint Base San Antonio (Camp Bullis), and Camp Swift have implemented REPI-related projects in Texas.

In 2013, the U.S. Departments of Agriculture, Defense, and the Interior established the Sentinel Landscapes Partnership initiative. Sentinel Landscapes seek to preserve working or natural lands, such as farms, ranches, and forests, to achieve the complementary goals of strengthening local economies, conserving habitat and natural resources, and protecting the vital missions of nearby military installations. Texas A&M University and the Texas A&M AgriLife Extension Service are leading state efforts to leverage the Sentinel Landscapes program and other conservation efforts to sustain military missions through private land stewardship of working lands. Potential statewide partnerships with the Texas Commander's Council and *Joining Forces* stakeholders include developing a strategic plan for supporting and protecting Texas military missions, exploring opportunities to initiate place-based pilots, and preparing nomination documentation to establish Texas Sentinel Landscapes projects.

3.1.4 Department of Defense Siting Clearinghouse

With the growth of the renewable energy sector, the DoD is increasingly called on to evaluate the compatibility impacts of wind, solar, transmission, and other projects on military activities. Created in 2010, the Siting Clearinghouse establishes a "one-stop-shop" to review energy proposals and explore mitigation strategies. The mission of the Clearinghouse is to protect DoD mission capabilities from incompatible energy development by collaborating with DoD entities and external stakeholders.

The Clearinghouse oversees both a formal and informal project review process. The formal process usually begins with the referral of a project to the DoD through the FAA's Obstruction Evaluation/Airport Airspace Analysis program. The informal process begins when other federal departments and agencies or a state or local government, an Indian tribe, or a landowner elevates a proposed project for review. Informal reviews are only advisory and the DoD does not prepare an authoritative position on the project.

In both the formal and informal review processes, the Clearinghouse provides information about the proposed project to experts in the various Military Services and other DoD entities. After qualitative and quantitative analyses, the Clearinghouse compiles responses into a single DoD position for consideration by the permitting agency.

3.1.5 Unmanned Aircraft System Policies

Unmanned Aircraft Systems (UAS), commonly referred to as drones, are an increasing encroachment risk to military installations. The availability of smaller, affordable drones on the market is spurring rapid growth of commercial applications, as well as hobbyist activity. UAS can create physical hazards, such as midair strikes with aircraft, or pose security and safety threats by flying near military personnel or over sensitive operational areas. Incidents involving unauthorized and unsafe use of small, remote-controlled aircraft have risen dramatically. Pilot reports of interactions with suspected unmanned aircraft across the United States have increased from 238 sightings in all of 2014 to 780 from January to August of 2015.[6]

Like traditional aircraft, the FAA regulates UAS to ensure safety in flight and on the ground. The FAA has issued new pilot and operating rules that took effect August 29, 2016 for unmanned aircraft weighing less than 55 pounds. The rules restrict drone use to visual line-of-sight operation during daylight hours at a maximum altitude of 400 feet above ground level and a maximum speed of 100 miles per hour. Recreational operators must give notice for flights within five miles of an airport to the airport operator and air traffic control tower. Regulations prohibit recreational operations in Class B airspace around most major airports without specific air traffic permission and coordination. Given the relative lack of guidance and the dispersed, small-scale nature of hobbyist operations, local law enforcement has struggled to recognize and limit UAS threats. The FAA has emphasized partnerships with local law enforcement agencies to identify and prevent unauthorized or unsafe drone operations.

States and local jurisdictions are increasingly exploring regulation of UAS through ordinances. Federal rules allow states and local governments to enact specific drone rules and enforcement

[6] State and Local Regulation of Unmanned Aircraft Systems (UAS) Fact Sheet

policies within their jurisdictions. In 2015, for example, the City of Los Angeles amended its municipal code to regulate drones.[7] However, to ensure a consistent federal framework for the regulation of airspace, local ordinances that ban hobbyists from operating small drones within city limits or within certain distances of landmarks should consult with the FAA and align provisions with federal rules.

3.2 State Programs

The State of Texas has also created entities and programs to protect and promote military missions through advocacy, communication, and compatibility planning.

3.2.1 Texas Military Preparedness Commission

Established in 2003, the Texas Military Preparedness Commission (TMPC) seeks to protect, expand, and attract new installations, military missions, and defense-related businesses in the State of Texas. The TMPC administers two financial and technical assistance programs designed to aid defense communities: the Defense Economic Adjustment Assistance Grant Program and the Texas Military Value Revolving Loan Fund. The DoD military installations in the state formed the Texas Commanders Council (TCC), a consortium of the commanding officers of the military installations. The commanding officer of NAS Fort Worth, JRB is a participating member of the group. The TCC coordinates with the TMPC on a variety of issues affecting the state's military installations, including encroachment management.

[7] http://www.inspirepilots.com/threads/los-angeles-uas-ordinance-lamc-sec-56-31.7519/

3.2.2 Texas Military

The Texas Military consists of the Texas Army National Guard (TXARNG), the Texas Air National Guard (TXARNG), the Texas State Guard, Domestic Operations Task Force and the Office of the Executive Director. The Adjutant General of Texas administers all branches under the command of the Governor. The TXARNG serves a dual state and federal mission, supplying personnel in response to domestic events, such as emergencies, as well as support for active-duty Army operations abroad. The state has approximately 19,000 TXARNG soldiers. The TXARNG staffs three of the major installations in the *Joining Forces* study area: Camp Maxey, Fort Wolters, and RTAHP.

3.3 State Regulatory Context

State law determines many of the strategies available to local governments seeking to promote compatibility around installations. Zoning is a common mechanism for reducing conflicts by controlling the intensity or type of development near military operations. The State of Texas, however, does not explicitly grant counties the authority to zone unincorporated land. County planning commissions in Texas can exercise the right to review and approve plats of subdivisions based on a plan for the economic and physical development of the county. With the exception of NAS Fort Worth, JRB and RTAHP, which are within urban settings, much of the rural land surrounding *Joining Forces* installations is unincorporated and therefore not subject to zoning laws.

The inability to zone unincorporated land has generated much debate over the years with critics maintaining that it deprives counties of a basic tool to address rapid growth or specific development impacts. One option for expanding county land use controls is to seek legislation that allows targeted zoning powers over specific unincorporated areas based on location,

population, or physical features. Using this approach, counties could pursue the authority to enact specialized zoning in proximity to military operations.

Beyond zoning, states often play a role in facilitating notification and coordination on real estate, development, and infrastructure decisions that could affect military-civilian compatibility. States, for example, can require owners to disclose the proximity of property to an installation prior to sale.[8] Currently, Texas state law does not require real estate agents to disclose the proximity of installations, though some agents in the region inform prospective buyers of nearby installations.

States can also mandate advisory consultation between installations and local governments on community development proposals or establish a process to coordinate the siting of major infrastructure systems, such as renewable energy. Texas Local Government Code, for example, states that local governments in the San Antonio and Wichita Falls area must seek comments and analysis from base or facility authorities if the community determines that a proposed ordinance, rule, or plan may affect an installation or military exercises or training activities.[9] The code also requires communities to notify a military base or defense facility of a proposed structure in an area within eight miles of the boundary line of the installation.[10] The applicability of these requirements depends on the size of the defense community. As currently written, the code's consultation requirements are not applicable to the *Joining Forces* installations. There are no formal requirements in place to notify installations of wind energy infrastructure, particularly in outlying areas that could impair the safe use of airspace. This

[8] Virginia Residential Property Disclosure Act (Title 55, Chapter 27 of the Code of Virginia

[9] Sec. 397.005. Consultation with or Notification to Military Base or Defense Facility Authorities: Proposed Ordinance, Rule, or Plan.

[10] Sec. 397.006. Consultation with or Notification to Military Base or Defense Facility Authorities: Proposed Structure.

JLUS can explore opportunities to formalize and expand consultation between military and civilian partners.

The TCC has expressed support for legislative actions that would expand and strengthen available compatibility tools, such as formal, enforceable notification processes and the early review of potential structures and developments. The TCC also encourages establishing funding mechanisms to purchase rights or restrictive easements for non-conservation lands near installations.

As described in **Section 9**, zoning remains a viable tool for cities seeking to control land use and development characteristics around installations. Generally, a city's ordinances are valid and enforceable only within its corporate limits. However, extraterritorial jurisdiction (ETJ) provisions grant cities authority to enact some regulations on contiguous unincorporated land. The size of a city's ETJ varies according to its population, ranging from one-half mile for communities with less than 5,000 people, to five miles for cities greater than 100,000 in population.

3.4 Regional Partnerships

Regional entities and their local partners have also been very active in planning for compatibility with military operations in North Texas, particularly around NAS Fort Worth, JRB.

3.4.1 North Central Texas Council of Governments

NCTCOG is a voluntary association of local governments, established to assist communities in planning for common needs, cooperating for mutual benefit, and coordinating for sound regional development. NCTCOG serves a 16-county area centered around Dallas and Fort Worth and has over 230 member governments, including counties, cities, independent school districts, and special districts. NTCOG's programs include community services, emergency

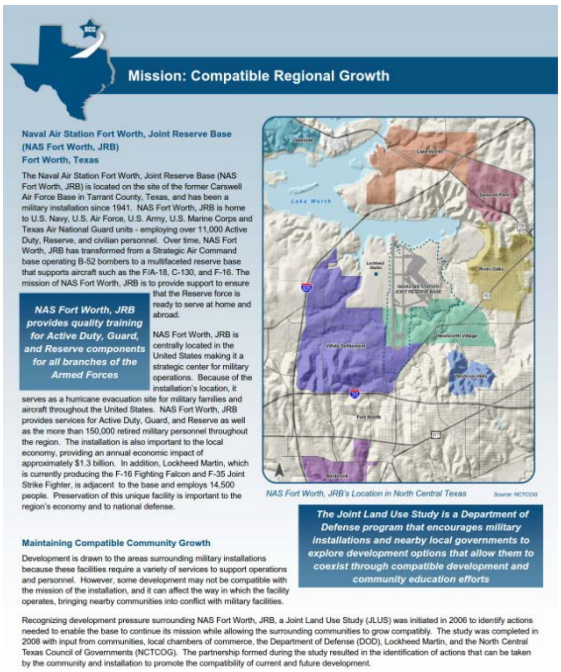
preparedness, environment and development, research and information, workforce development, and transportation. The Transportation Department of NCTCOG coordinates compatibility initiatives around the region's military installations, including the *Joining Forces* study.

3.4.2 2008 Joint Land Use Study

A foundational collaborative effort was the 2008 JLUS, involving the Cities of Benbrook, Fort Worth, Lake Worth, River Oaks, Westworth Village, and White Settlement, as well as Tarrant County. That JLUS recommended a series of strategies to reduce the risk of encroachment around NAS Fort Worth, JRB with an emphasis on the following immediate implementation steps:

- Establish an Oversight Committee to monitor changes and to work closely with the base on land use and encroachment issues;
- Revise and continue to enforce current regulatory requirements such as zoning and building codes to minimize encroachment and noise issues;
- Institute noise level reduction measures and a sound attenuation program for those incompatible structures located in the 65 decibel (dB) DNL (denotes average day/night noise levels) noise contour or higher;
- Establish a real estate advisory service for the noise-affected area; and
- Initiate land protection and/or voluntary acquisition in the CZs and APZs.

3.4.3 Joint Land Use Study Implementation



As an outgrowth of the 2008 JLUS, study partners along with the NCTCOG formed the Regional Coordination Committee (RCC). The RCC serves as a collaborative forum for developing, implementing, and monitoring programs and policies that enable the continued coexistence of the installation and communities. Members of the RCC include local government staff and elected officials; NAS Fort Worth, JRB; Lockheed Martin; and community groups. Since 2008, the RCC has worked to pursue 17 implementation action items resulting from the JLUS process. Among the critical, early implementation items was creation of the RCC Development Review Web Tool. This web-based tracking tool acts as a clearinghouse to discuss various community projects, including parcel-specific zoning changes, height obstructions, site plan applications, and special exceptions. It also provides a forum for reviewing broader long-term actions, such as comprehensive plan updates, zoning ordinance language, and capital improvement plans for public buildings.

In 2012, NCTCOG used a grant from the U.S. Department of Housing and Urban Development to prepare the Planning for Livable Military Communities (PLMC) study for local government partners in proximity to the base. The study developed regional economic development strategies and explored options to improve housing opportunities; enhance area corridors; and expand mobility choices, including bike and pedestrian and public transportation. The plan highlighted additional strategies that communities could implement to promote compatibility

with the base, such as adopting the most recent building codes to provide better sound attenuation; considering a zoning overlay to encourage compatible land uses in areas of high noise and safety concerns; and focusing new development in city cores. Following the PLMC effort, partners formed the West Tarrant Alliance to advance the shared economic interests of the county's western communities.

As a complementary effort to PLMC, NCTCOG also conducted a transportation assessment around NAS Fort Worth, JRB to facilitate safe and efficient access to the base and prevent further disruption of the area's overburdened transportation network.

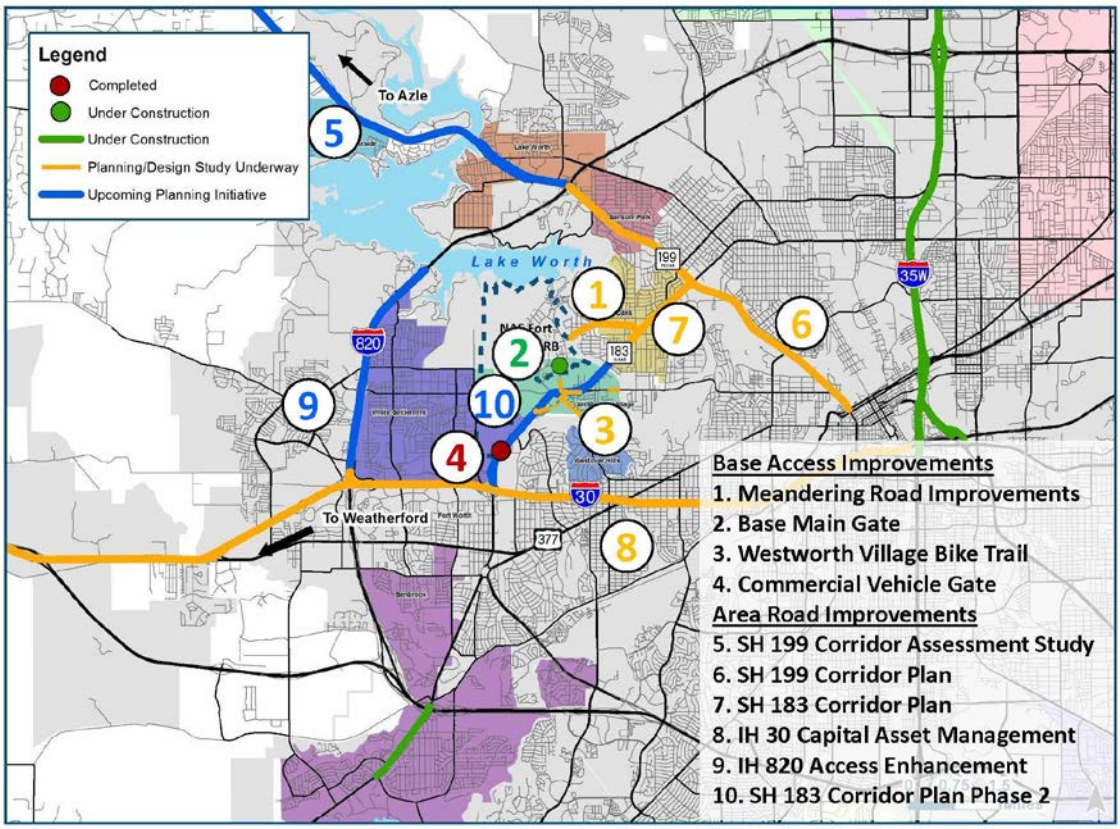
Though much of the prior compatibility effort in the region has focused on NAS Fort Worth, JRB, a specific goal of *Joining Forces* is to expand collaborative partnerships and best practices to other defense communities in North Texas. In building the groundwork for broader, longer-term collaboration across all communities, the RCC has indicated its support for state legislation that promotes compatible developing through the following tools:

- Creating effective methods to initiate dialogue between project developers, military bases, and City, County, and State Officials prior to development for certain proposed activities (e.g. wind turbines, communications towers, sensitive land uses, etc.) that may adversely affect military operations;
- Enhancing communication efforts to inform current and potential residents who may be affected by military operations (similar to HB 1639 84R) and;
- Supporting collaboration between local governments, the state, and the Federal Aviation Administration to advance regulations to ensure safe operations of unmanned aircraft vehicles

NCTCOG, as the Metropolitan Planning Organization responsible for transportation planning in the region, has undertaken numerous projects to enhance access to NAS Fort Worth, JRB and

improve area roadways (See **Figure 10**). DoD monies funded the commercial vehicle gate and main gate improvements.

Figure 10. Transportation Projects, NAS Fort Worth, JRB, October 2016



4. NAS Fort Worth, Joint Reserve Base Profile

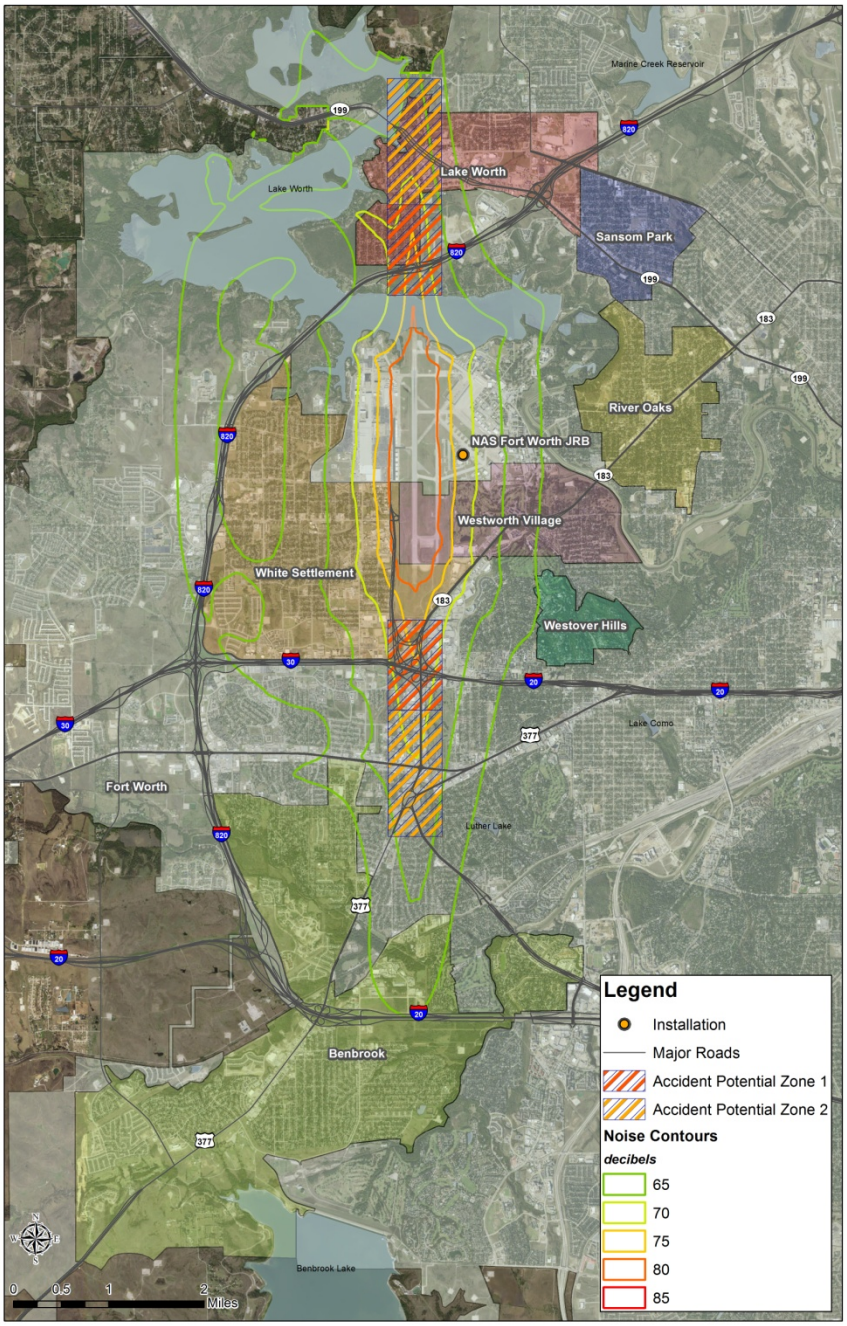
4.1 History

Naval Air Station Fort Worth, Joint Reserve Base began in 1932 as Tarrant Field. In 1941, the U.S. government selected the site adjacent to the field as a Consolidated Aircraft factory for the assembly of B-24 Liberator bombers, beginning a tradition of aircraft production that continues today at Lockheed Martin. After World War II, the newly designated Carswell Air Force Base (AFB) became one of the few Strategic Air Command installations and transitioned through a number of bombers, such as the B-36 Peacemaker, B-52 Stratofortress, and the B-58 Hustler. Over the years, the base contributed resources and trained pilots in support of major conflicts around the globe.

In 1991, the Base Realignment and Closure Commission selected Carswell AFB for closure. The site closed in 1993. A year later, the installation became a Naval Air Station Joint Reserve Base operated under Commander, Navy Installations Command. Numerous Navy Reserve, Marine Corps, Air Force, and Air National Guard resources relocated to the base.

Source:www.cnic.navy.mil/regions/cnrse/installations/nas_jrb_fort_worth.html

Figure 11. NAS Fort Worth, JRB and Surrounding Communities



4.2 Installation Mission and Operations

NAS Fort Worth, JRB's mission is "to provide joint training capabilities to enable War Fighter readiness while sustaining personnel and families' needs, future compatibility and inculcating a culture of safety." The primary responsibility of NAS Fort Worth, JRB is to ensure combat readiness by training and equipping aircrews and aviation ground-support personnel. The base hosts 40 separate commands that represent the U.S. Navy, U.S. Marine Corps, U.S. Army, U.S. Air Force, and TXANG. Approximately 9,900 personnel operate at the 2,300-acre base, including active-duty military personnel, Guardsmen, Reservists, and civilians. These personnel conduct an average of 2,000 air operations each month. Operations take place between 7 a.m. and 11 p.m. **Table 6** shows the squadrons and aircraft at the base. Pilots from NAS Fort Worth, JRB use airspace in the Brady and Brownwood MOAs, which are about 70 miles southwest of the base by air travel (See **Section 8**). The base also hosts a number of transient aircraft. The adjacent Lockheed Martin facility shares the base runway for manufacturing and testing activities.

Table 6. NAS Fort Worth, JRB Squadrons and Aircraft

Fixed Wing	Type	Quantity
VR	C40	3
VMFA	F-18	4
VMGR	KC-130J	5*
Army	C12/UC-35	3/1
Air Force	F-16	24
TXANG	C-130	8

* Possible Transition to 10-15

Source: Source: Community Planning and Liaison Officer, NAS Fort Worth JRB

The U.S. Air Force has identified NAS Fort Worth, JRB as a candidate site for basing of the F-35 aircraft. The Air Force will make a basing decision in 2017. NAS FW JRB is the preferred site for the F-35.

4.3 Initial Compatibility Concerns

NAS Fort Worth, JRB affects and interacts with several cities in Tarrant County: Fort Worth, Benbrook, Lake Worth, River Oaks, Sansom Park, Westover Hills, Westworth Village, and White Settlement (See **Figure 11**). Air safety zones (CZ, APZ I, and APZ II) extend to the north off the base. To the south, APZ I and APZ II cross the installation boundary into the community. High average levels of aircraft noise extend north and south from the runway with lower noise exposure spreading farther into the community.

Several of the surrounding communities have adopted overlays to address air safety and noise impacts (See **Section 9**). In general, community and stakeholder feedback indicates that aircraft noise around NAS Fort Worth, JRB does not significantly affect quality of life. Staff has noted that, in the previous 12 months, the base received 10 noise-related complaints, eight of which did not originate from NAS Fort Worth, JRB operations. Base aircraft, however, may generate noise impacts when conducting training activity in outlying airspace, affecting communities in the far southwestern portion of the study area (See **Section 8)**.

Initial compatibility concerns for NAS Fort Worth, JRB revolve primarily around new development pressures and flight obstructions. Even though current residents are relatively accustomed to existing noise, increasing infill development and redevelopment activity in surrounding communities could place more people in proximity to aircraft noise. Similarly, residential turnover in nearby mature neighborhoods could attract new residents without ties to the base or familiarity with the area's long military history. Mission change could also alter the existing noise environment. As noted earlier, the NAS Fort Worth, JRB is a candidate site

for basing of the F-35. Though noise varies based on operational characteristics, the F-35 aircraft is in general marginally louder than the F-16. In addition, the engines of this 5th generation fighter operate at another frequency that could produce differing perceptions of nuisance in the community. On the air safety side, portions of the APZs within Lake Worth to the north and White Settlement to the south do not have regulatory overlays in place to control development intensity or land use type in areas of higher accident risk.

As described earlier, renewable energy infrastructure, particularly wind turbine developments, can pose a threat to air safety near the base and in MTRs to the southwest. The base has also had sightings of UAS in the area, which create a flight and security hazard.

Overall, NAS Fort Worth, JRB has used various tools to reduce encroachment challenges with its neighbors. The base has conducted encroachment-related planning through the AICUZ, EAP, and JLUS and has maintained an active presence in ongoing coordination activities, such as the RCC. Surrounding communities express strong support for base personnel and operations.

5. Camp Maxey Training Center Profile

5.1 History

The U.S. government activated Camp Maxey in 1942 for training infantry during World War II, including the 102nd Infantry Division and the 99th Infantry Division. During the war, the installation could accommodate almost 45,000 soldiers and held German prisoners of war. However, by the end of 1945, the government had deactivated Camp Maxey and the TXARNG acquired the installation in 1949. The U.S. Army Corps of Engineers flooded a portion of Camp Maxey to create Pat Mayse Lake in the 1960s, thus reducing the installation's size.

Source: Handbook of Texas Online, www.tshaonline.org/handbook; Camp Maxey

5.2 Installation Mission and Operations

The TXARNG staffs Camp Maxey with 18 full-time personnel on site. Camp Maxey provides combat readiness training for up to battalion-sized elements for TXARNG units in the northeastern part of the state, including:

- Military police training;
- Light Infantry Training;
- Small Unit Tactics and Engineer training;

- Several firing ranges, including 9 millimeter (mm) pistol range, 5.56 mm Pop Up Range, 5.56 mm Zero Range, 7.62 or 5.56 mm fixed machine gun range, and a 40 mm Grenade range;
- Land Navigation Course;
- Confidence Course;
- Nuclear Biological Chemical chamber;
- Mobility, counter mobility, survivability and construction operations;
- Mobile Operations and Urban Training (MOUT) site;
- A Unit Training Equipment Site where the motor pool is maintained;
- A buried Ammunition Supply Point; and
- Storage for 8,000 gallons of fuel.

Trainees who visit Camp Maxey include units from the TXARNG, U.S. Army Reserve, U.S. Navy, U.S. Army, and U.S. Marine Corps Reserve, as well as personnel outside of the DoD. The 2nd detachment of Garrison Training Center Command is the main user. Usage tends to be highest on drill weekends from March through October with typically at least one unit participating every weekend. Camp Maxey has experienced a 67 percent increase in use since 2012, with 32,516 personnel training at the site in 2014.

TXARNG Chinooks from RTAHP fly into Camp Maxey once or twice a year; Black Hawks also occasionally use the site. There is an informal Landing Zone (LZ) in the cantonment (developed) area near U.S. 271.

Camp Maxey faces operational constraints due to size and environmental issues. The acreage at the installation is not sufficient to accommodate necessary training, requiring units to travel to other facilities around the state. The TXARNG has expressed interest in securing approval from the U.S. Army Corps of Engineers (USACE) to conduct helicopter water exercises at Pat Mayse Lake and designating formal landing and drop zones. Following a 2015 Biological

Opinion on the status of the ABB from the U.S. Fish & Wildlife Service, Camp Maxey can resume controlled burns and the cutting of grass on previously restricted parts of the installation. (See **Section 2.3**).

5.3 Initial Compatibility Concerns

The 6,650-acre Camp Maxey is less than 10 miles north of the City of Paris, neighboring the unincorporated community of Powderly (See **Figure 12**). Part of the Surface Danger Zone (SDZ), which predicts the area in which a projectile will land by direct fire or ricochet, falls outside of the installation boundary. Camp Maxey has an agreement with the USACE to lease the affected land outside of the boundary. The range fan is five meters too short to accommodate 50 caliber weapons training. Currently, there is minimal residential development surrounding the installation with a very low-density subdivision, Beaver Creek, close to the boundary, and manufactured houses in Powderly near range operations. Personnel are not aware of noise or other complaints from residents. Any northward shift of interest in residential development, however, would place new houses closer to Camp Maxey.

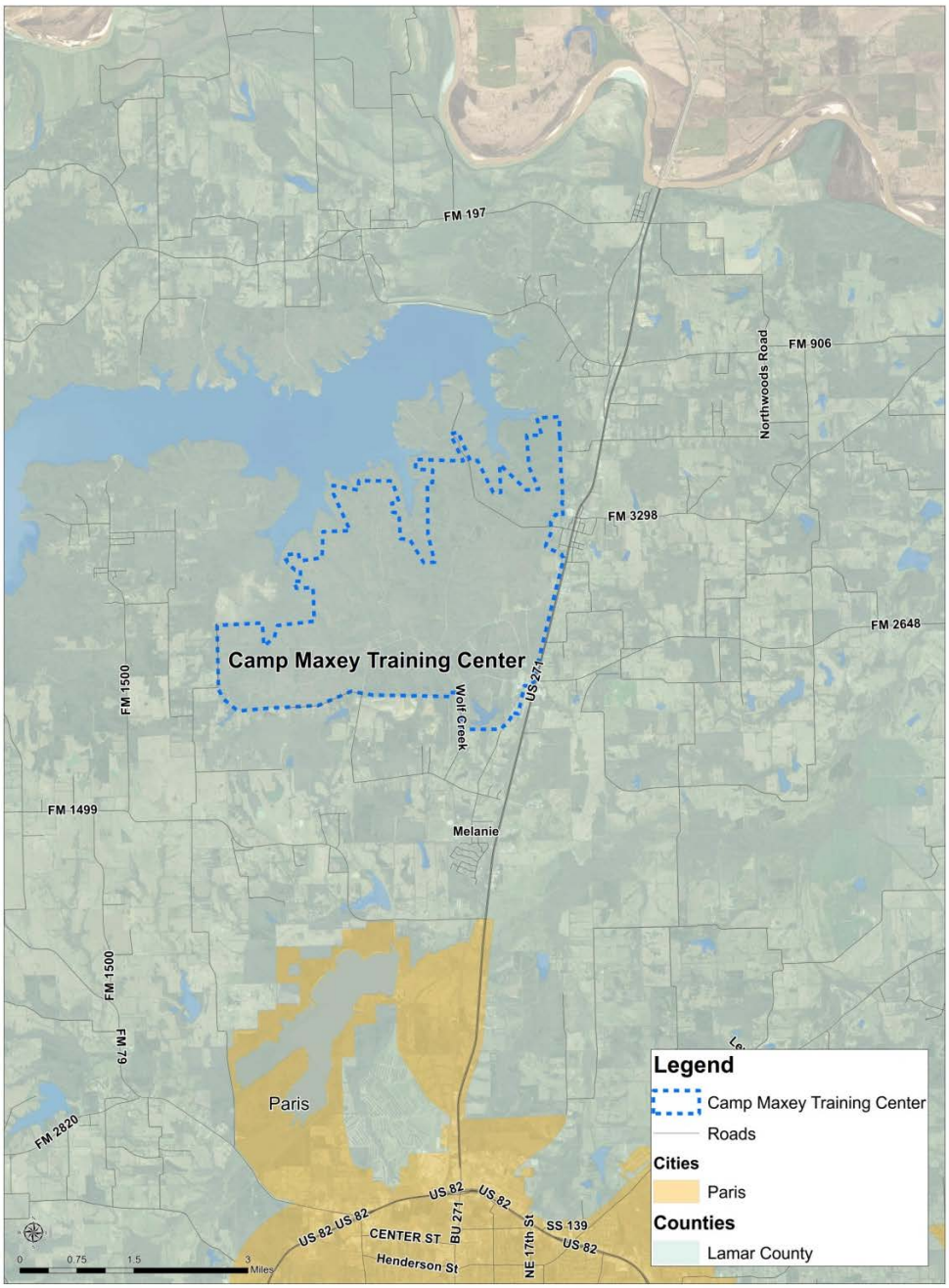
Compatibility issues include:

- The primary land use incompatibility facing Camp Maxey results from adjacency with Pat Mayse Lake. The installation boundary does not extend to the shores of the lake, preventing Camp Maxey from fully securing its northern perimeter. Hunters entering from adjacent recreational lands regularly trespass onto Camp Maxey, posing a safety risk for themselves, as well as soldiers in the training areas. Stakeholders have also noted that deer stands placed on U.S. Army Corps of Engineers property are sometimes oriented toward the installation, creating a firing hazard.
- The City of Paris holds an easement for use of an on-base road; however, many people not associated with the City use the roadway, potentially interfering with operations.

- The lack of firebreaks between Camp Maxey and surrounding areas has meant that fires have spread onto the installation property in the past.
- Stakeholders also cited roadway related compatibility issues. Increasing traffic activity associated with a mulch business near Camp Maxey's main gate also conflicts with gate traffic. The physical condition of the easement road that runs through the installation has deteriorated due to ambiguity over maintenance responsibilities. U.S. 271 is a four lane divided highway with access from I-30 in Texas to I-40 in Oklahoma. The remaining 10.4 miles of divided highway on U.S. 271 should be complete in August 2017, offering adequate capacity for brigade level movements.
- General aviation activity over the eastern portion of the installation exposes low-flying aircraft to firing hazards during range operations. Stakeholders have also noted that a lack of signs and wayfinding makes the installation less identifiable to both visiting units and the public.

Camp Maxey has held open-house events in the past but has not conducted community outreach activities recently. The installation maintains a strong relationship with the USACE Southwestern Division, Fort Worth District and coordinates with the Tulsa District of the Corps, which controls nearby Hugo Lake.

Figure 12. Camp Maxey and Surrounding Communities



6. Redmond Taylor Army Heliport Profile

6.1 History

The RTAHP occupies the area formerly known as Hensley Field and Naval Air Station, Dallas (NAS Dallas). The City of Dallas established Hensley Field in 1929 as a training site for Reserve pilots of the then-U.S. Army Air Corps. The facility became NAS Dallas in 1943, providing primary flight training for aviators in the Navy, Marine Corps, and Coast Guard. In 1946, the United States established a Naval Reserve training program at NAS Dallas. Hensley Field passed from the command of the U.S. Air Force to the U.S. Navy in 1949, but the field continued to host air operations for the Air Force Reserve, the TXARNG, and the USAF Civil Air Patrol. The Base Realignment and Closure Commission selected the installation for closure in 1993. In 1998, NAS Dallas closed, but the site continues to serve as a military installation, with the City of Dallas leasing the site to TXARNG and Army Reserve Complex tenants.

6.2 Installation Mission and Operations

The RTAHP is on the west side of the former Hensley Field (NAS Dallas). The heliport is an approximately 110-acre lease, housing the Dallas Army Aviation Support Facility #3, the 2-149th Aviation Readiness Center, and the Field Maintenance Shop #16. Approximately 200 Soldiers and Singapore Air Force personnel staff the site on a daily basis. Another 250 military personnel train during drill weekends. The Republic of Singapore Peace Prairie Program also operates on the site under a separate lease.

The TXARNG operates eight CH-47 Chinooks on site for cargo and troop transport training. The helicopters fly to Kenneth Copeland Airfield in Tarrant County, Fort Wolters in Mineral Wells, and Camp Bowie in Brownwood. The Royal Singapore Air Force (RSAF) conducts training with

six Chinooks. Combined, the TXARNG and RSAF units fly approximately eight hours per day, typically Monday through Friday but with occasional weekend flights. Frequent nighttime operations occur Monday through Thursday. In addition to their wartime mission, RTAHP personnel fight wildfires with the Texas Forestry Service and assist local and state authorities during natural disasters such as hurricanes and floods.

The Grand Prairie Armed Forces Complex is on the east side of the field, serving as an administrative center for several U.S. Armed Forces branches. Facilities include a headquarters building and a large vehicle maintenance area. The TXARNG also houses its 176th Engineer Brigade at the complex. The east side of the installation does not host any aviation assets.

Aviation units at RTAHP log about 1,100 to 1,200 flight hours per year. Activity may increase slightly in the near future and the site could add up to six UH-60 aircraft, depending on the training needs of the Texas Military Forces.

6.3 Initial Compatibility Concerns

The RTAHP is directly adjacent to residential areas in the Cities of Dallas and Grand Prairie (See **Figure 13**). These close-in neighborhoods pose both noise- and security-related issues and constrict available training space.

Specific compatibility issues include:

- To reduce noise exposure in the community, the aviation units use half of the local traffic pattern, avoiding incompatible areas, including development southwest of the base. Two significant recent routing adjustments in the remaining airspace further limit opportunities for realistic training and more complex air maneuvers.
- City officials have cited some noise complaints related to helicopter operations from residents in the Redbird community of Dallas. Most noise complaints are around

airfields when units practice approaches. A deed restriction in a nearby addition of the Mountain Creek neighborhood requires disclosure of noise exposure.

- The direct adjacency of housing to the installation and the use of private security at the entry have raised ongoing security concerns. In addition, all traffic heading to and from the installation, including heavy vehicles, must travel through a neighborhood of single-family homes, creating a nuisance for residents. The bridge just inside the installation gate is aging and may require repair.
- Officials also noted examples of trespassing with people cutting fencing to gain illegal access to the facility.

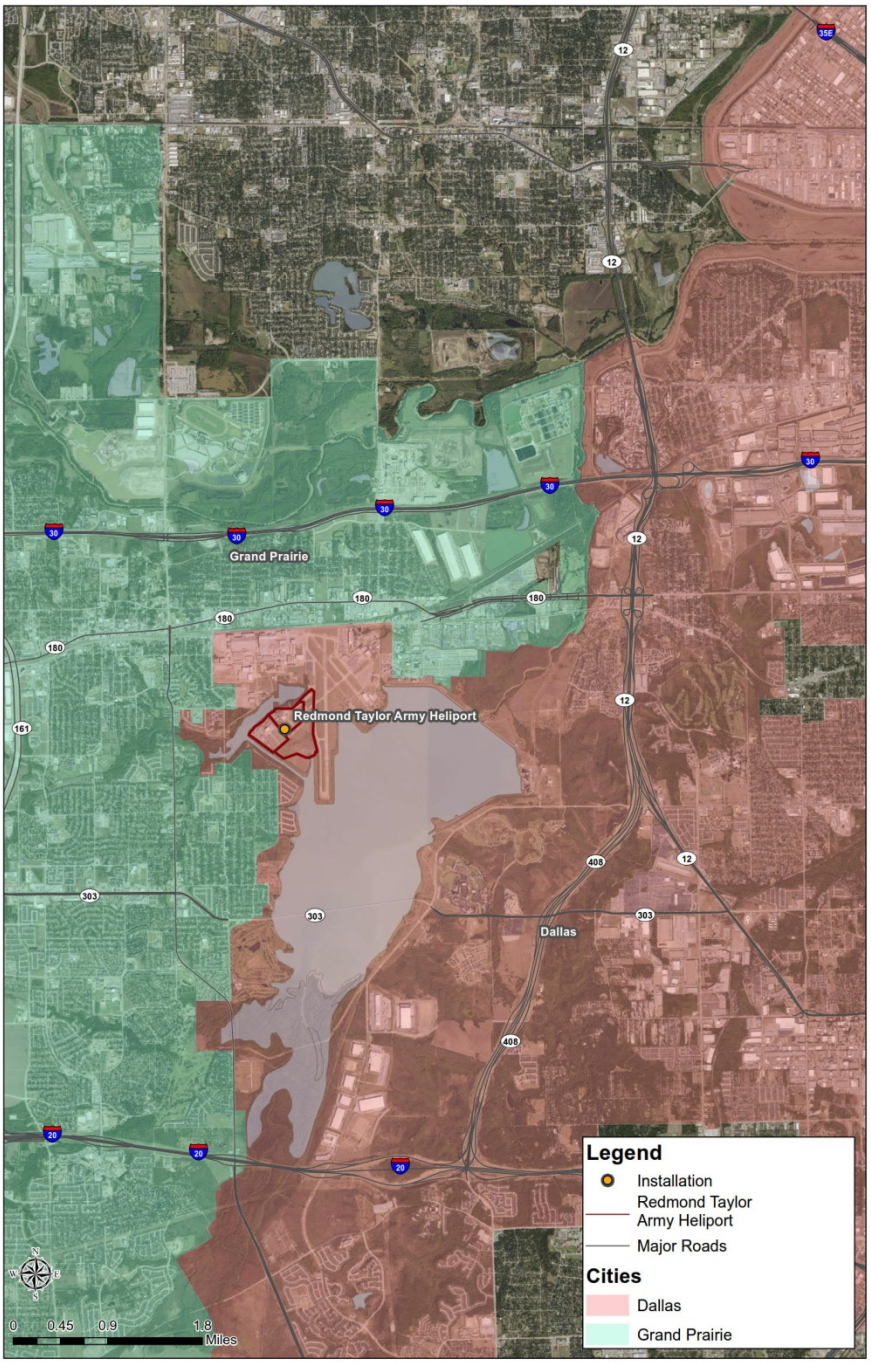
Recent proposals could result in additional land use conflicts. Development pressure in the vicinity includes proposed housing at the former Triumph Aerostructures site just to the north; commercial/potential mixed-use development south of Mountain Creek Lake; the continued growth of residential areas to the north, west, and south of the field; and the potential for the redevelopment of current warehouse uses to the east and south.

Commercial and general aviation, flight obstructions, and UAS activity also create challenges for RTAHP operations. The proximity of the busy Class B airspace of the Dallas-Fort Worth International Airport and Dallas Love Field imposes altitude restrictions on flights and reduces the ability of RTAHP units to vary routes. The City of Dallas recently rejected a proposal for a gas well to the southeast of the heliport due to concerns that it would be a flight hazard. Gas wells are present at the Eagle Mountain Training Area. Installation personnel have also reinforced that UAS activity is an increasing security and encroachment issue for air operations.

The tenants operating in the two complexes at RTAHP lease facilities from the City of Dallas. The city and neighboring businesses use parts of the vacant runway for vehicle storage and police driver training, limiting operational use and causing liability concerns. To date, military and community stakeholders have not participated in a formal process to coordinate on

compatibility issues. Continued challenges and the risk of more operational constraints, however, have heightened RTAHP's interest in building stronger relationships with surrounding communities.

Figure 13. RTAHP and Surrounding Communities



7. Fort Wolters Training Center Profile

7.1 History

The Texas National Guard established Camp Wolters in 1925. During World War II, the site grew from 2,350 acres to 9,850 acres, for a time serving as the largest infantry replacement training center in the United States. It also housed German prisoners of war. After the war, the government deactivated the camp and it became an Air Force base in 1951 with the mission of training Air Force engineers. In 1956, Camp Wolters reverted to the U.S. Army to house the United States Army Primary Helicopter School. The camp achieved designation as a permanent military base in 1963, acquiring its current name of Fort Wolters. At its training peak in the Vietnam era, the installation featured three active heliports and 25 staging fields. The federal government deactivated the installation in 1973. The site now houses a TXARNG training center, along with industrial park uses, a branch of Weatherford College, and a summer camp for the Civil Air Patrol.

Source: AECOM

7.2 Installation Mission and Operations

The Maneuver Training Center – Light at Fort Wolters provides pre-mobilization and sustainment training for all northern TXARNG units west of I-35. This training includes:

- 24-kilometer Improvised Explosive Device defeat route along the perimeter of the facility;
- Mobile Operations and Urban Training sites;
- Simulations, including small arms training and known-distance ranges;
- Hand grenade qualification;
- Nuclear Biological Chemical chamber;
- Forward Operating Base simulation;
- Acreage for bivouac and maneuver training;
- A UTES where the motor pool is maintained (can also serve as a maintenance facility to support habitual users);
- A State Shop for maintenance; and
- Storage for 14,000 gallons of fuel.

The installation supports Special Forces, Airborne, and Joint Training operations, including airdrops and air landings from the 136th Texas Air National Guard (TXANG) unit out of NAS Fort Worth, JRB. Operations involve heavy drops, light drops, and personnel drops. Fort Wolters is the closest training site for units from NAS Fort Worth, JRB.

Fort Wolters has a staff of 25 full-time personnel, but an increasing volume of military personnel visit the facility each year. Drill weekends from March through May see the highest levels of activity. In 2014, 48,745 total visitors came to Fort Wolters (47,309 military personnel; 1,436 non-DoD personnel), representing a 68 percent increase over 2012 activity.

7.3 Initial Compatibility Concerns

The almost 4,000-acre installation largely surrounds Lake Mineral Wells State Park and Trailway (See **Figure 14**). While the area is mostly rural, a small amount of residential development to the north requires aircraft flying to Fort Wolters along a north-south route to navigate between two houses. Housing to the west also brings residents close to the boundary of SDZs, which are the computer-modeled footprint for an impact area related to ammunition fired from the Fort Wolters firing ranges. These homes are within the east-west drop zone area. Future development north or west of the installation could affect C-130 drop zone run-ins. Wind energy development is also a growing compatibility concern for the area. Several wind turbines exist near the drop zone run-ins and developers have announced additional wind farms. Stakeholders also cited the presence of scattered unexploded ordnance in the area.

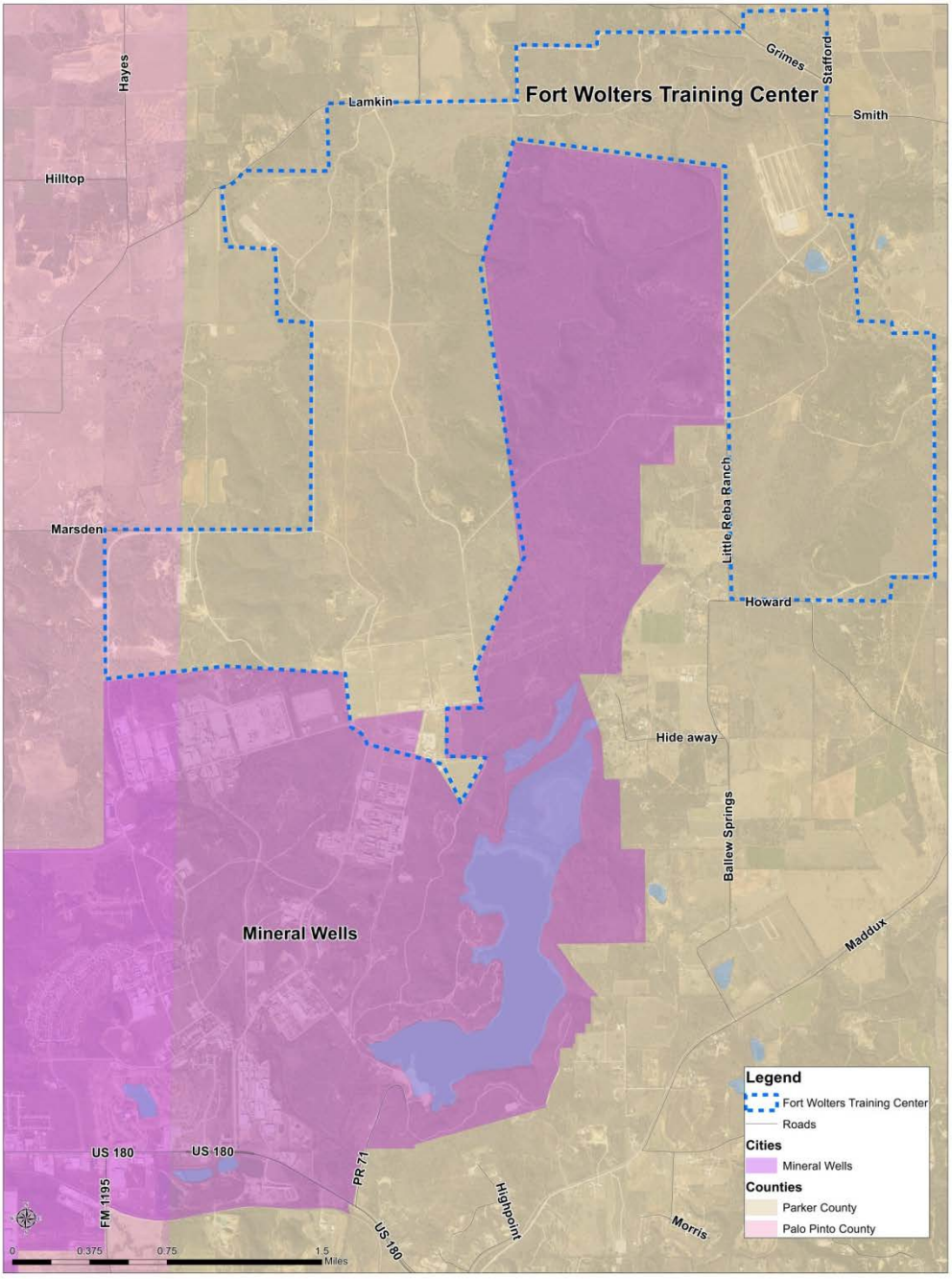
Though the installation is next to a large park, trespassing has not been a major issue to date. However, this proximity raises the risk of illegal entry onto military lands by hunters or other recreational users and places emphasis on opportunities for coordination with the Texas Parks & Wildlife Department.

The area is rich in natural and cultural resources. Fort Wolters is home to 52 documented archaeological sites, including historic military sites; late 19th- to early 20th-century homesteads; and Native American burial grounds and camp sites. The area also has plentiful deer hunting opportunities. Stakeholders have also noted the increasing presence of an invasive and potentially destructive feral pig population. The installation is interested in exploring an ACUB initiative to identify priorities for establishing conservation-related buffers (See **Section 3.1.3**).

Fort Wolters enjoys a strong collaborative relationship with the City of Mineral Wells, though interaction with the Counties of Palo Pinto and Parker is less frequent and formal. Recent

consultation between the military and the city on a communications tower proposal to the west of the installation resulted in denial of the request due to concerns over aviation safety. The community of Mineral Wells is highly supportive of the nearby military mission and has expressed interest in increased operations at the installation. Fort Wolters also has a partnership with the Texas Forest Service (TFS). As part of a memorandum of agreement, the TFS is establishing an office near the Ammo Supply Point. The TFS stores firefighting equipment at Fort Wolters and conducts controlled burns on the property.

Figure 14. Fort Wolters and Surrounding Communities



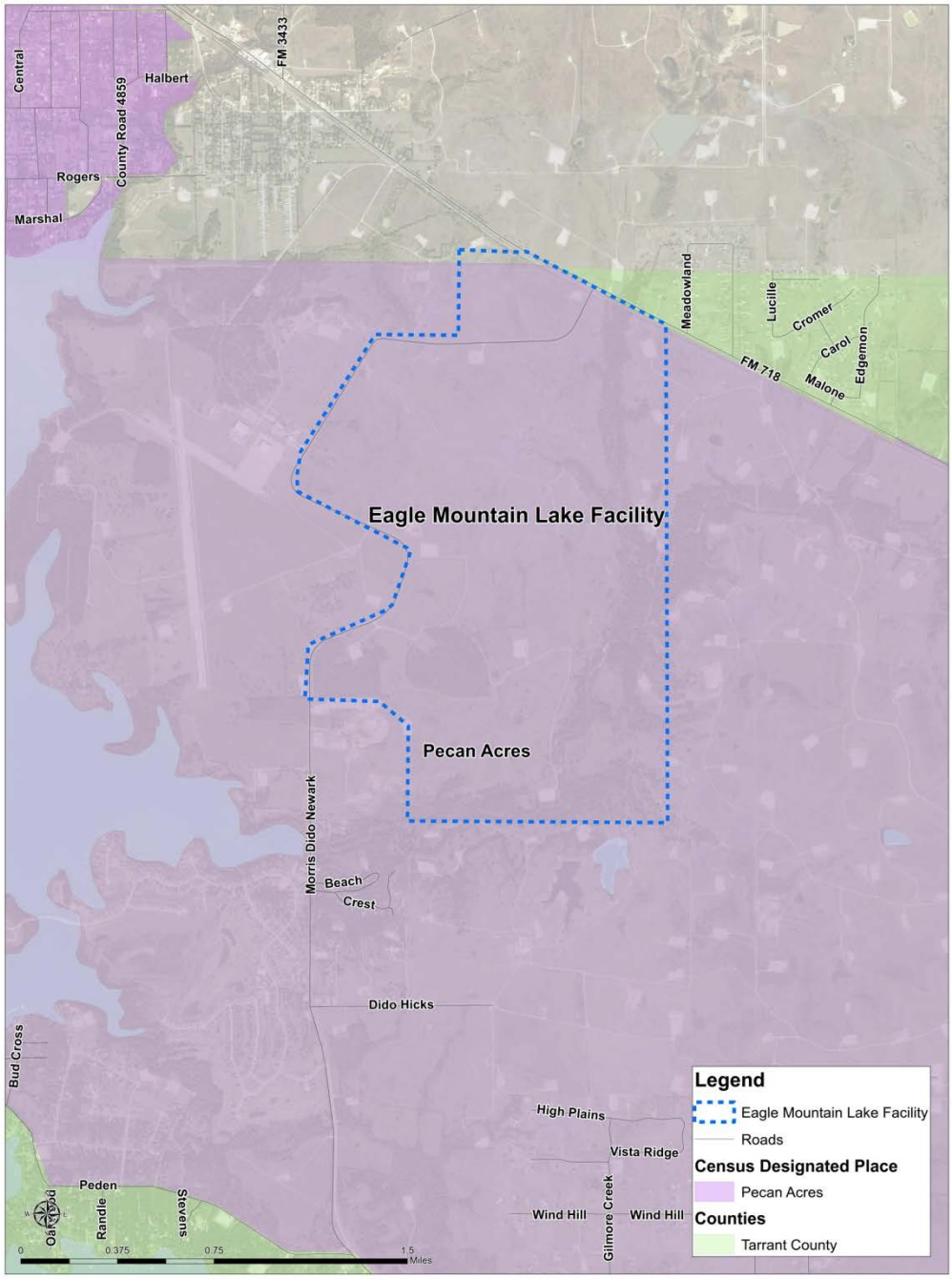
8. Ancillary Sites

In addition to the four high-intensity installations profiled above, the *Joining Forces* study area includes the following ancillary sites that provide training assets in support of higher intensity facilities, as well as maintenance sites, administrative centers, or training areas with lower impact operations.

8.1 Eagle Mountain Lake Facility

Fort Wolters manages the Eagle Mountain Lake Facility, which is east of the Copeland Airfield in Tarrant County (See **Figure 15**). The largely rural Pecan Acres community is east of Eagle Mountain Lake. Personnel use the 1,212-acre site approximately six times per year for field training and bivouacking (temporary camping). Units also conduct regular helicopter confined space landings and angled maneuvers. Proposed wind turbines near the Eagle Mountain Lake Facility are a potential flight hazard. Development in Tarrant County also continues to encroach on the site.

Figure 15. Eagle Mountain Lake Facility and Surrounding Communities

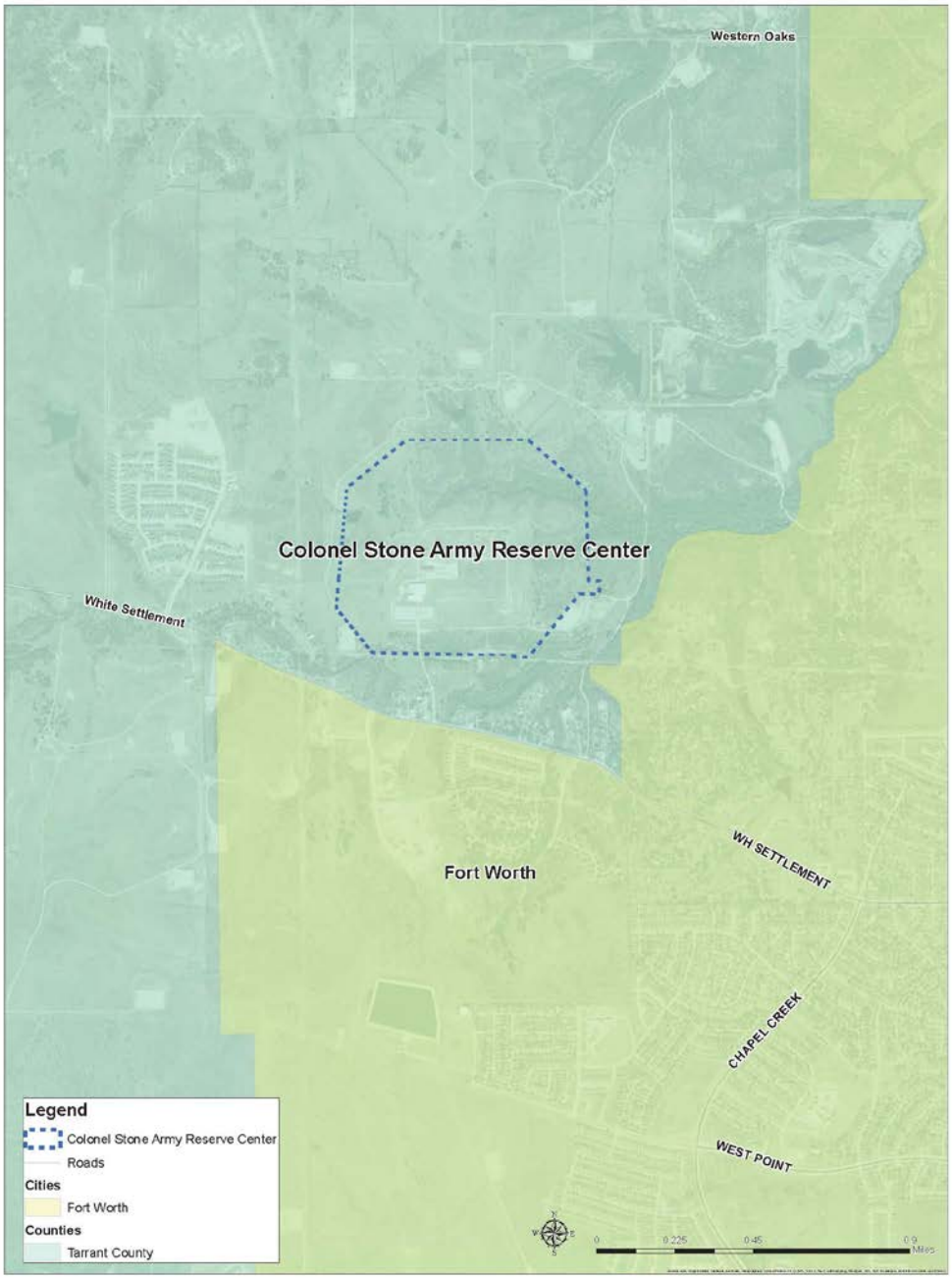


8.2 Colonel Stone Army Reserve Center

The Colonel Stone Army Reserve Center (also known as Fort Worth Army Reserve Center) is off White Settlement Road in the western portion of Tarrant County. The 240-acre site supports the 370th Chemical Company, 320th Quartermaster Detachment, and the 90th Aviation Support Battalion. This facility is primarily an administrative center but also accommodates convoy, land, field, and helicopter training. Approximately 500 to 1,000 Reservists come to the facility once a month to drill. In addition, the facility also includes an Organization Maintenance Shop building, administrative areas, vault, weapons simulator, and physical fitness area.

The site falls in unincorporated Tarrant County (See **Figure 16**). Subdivisions built in the past decade surround the southern and western boundaries. Facility managers have also expressed concerns about traffic safety near the entrance. Continued growth could hamper operational capacity by exacerbating traffic issues and increasing the risk of noise complaints.

Figure 16. Colonel Stone Army Reserve Center and Surrounding Communities



8.3 Brownwood and Brady Military Operating Areas

Due to mission requirements and safety issues, military aircraft participating in training activities must separate from non-military aircraft. Special Use Airspace (SUA) designates the boundaries of military operations and restricts access to the area by non-military aircraft during active operations. MOAs are a type of SUA. NAS Fort Worth, JRB tenant units conduct training activities in the Brownwood and Brady MOAs, approximately 70 miles southwest of the base (See **Figure 17**). The MOAs also establish maximum and minimum altitudes for aircraft operations. This training airspace is operational from sunrise to 11 p.m., Monday through Friday, or as posted by FAA-issued Notices to Airmen.

The U.S. Air Force owns the Brownwood MOA, which encompasses approximately 3,200 square miles of training airspace. Altitudes range throughout the area from a low of 7,000 feet above mean sea level (MSL) to a high of 18,000 feet MSL when in use. The U.S. Air Force also owns the Brady MOA directly south of the Brownwood MOA. This area offers approximately 1,500 square miles of training airspace. The Brady MOA altitudes range from 500 feet above ground level to 18,000 feet MSL. The Air Force's 301st Fighter Wing schedules use of the Brownwood and Brady MOAs.

The MOAs cover the far southwestern part of the study area, overlying portions of Brown, Callahan, Coleman, Comanche, Concho, Eastland, Erath, Llano, Hamilton, McCulloch, Mills, Runnels, and San Saba Counties.

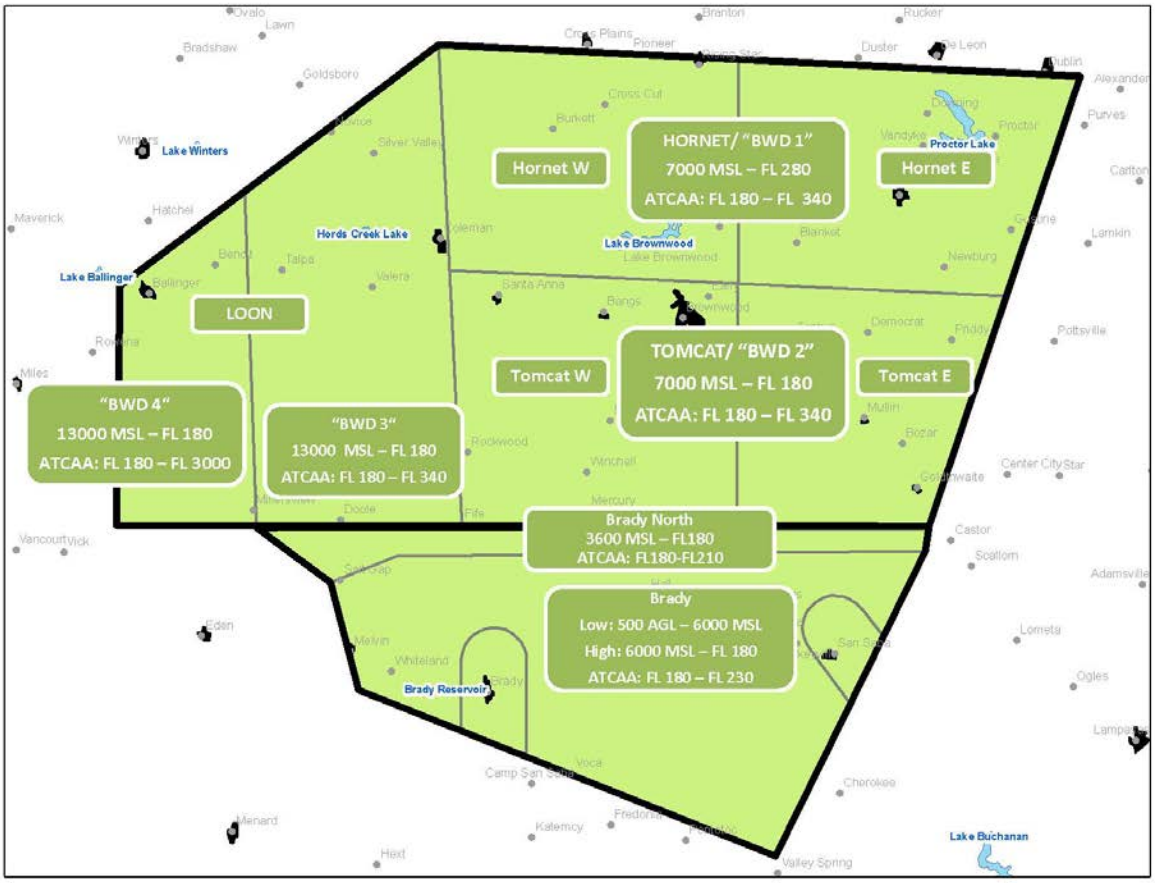
Aircraft participating in training exercises use MTRs to access airspace. These routes designate air corridors for a variety of training purposes such as high- and low-altitude vectoring, slow- and high-speed military flight, and tactical training. The Air Force's 301st Fighter Wing schedules use of MTRs to access local training areas. Commonly used MTRs are IRs 103, 105,

123, 124, and 139; VRs 101, 104, 118, 143, 186, 1110, 1124, 1128, and 1137; and SRs 228 and 270 (See **Figure 18**).

Several military units throughout the country operate in the Brownwood and Brady MOAs, but primary users are from NAS Fort Worth, JRB; Dyess AFB; Randolph AFB; Laughlin AFB; Sheppard AFB; NAS Corpus Christi; Altus AFB; and Tinker AFB. Priority of use is given to local squadrons, including the Air Force Reserve, 301st Fighter Wing, which flies the F-16C Fighting Falcon; the Marine Aircraft Group 41 (MAG 41), Marine Fighter Attack Squadron (VMFA-112), which flies the FA-18 A+ Hornet; and the TXANG 136th Airlift Wing, which operates the C-130 Hercules. Personnel at NAS Fort Worth, JRB have noted an increase in activity in the MOAs with the number of annual operations rising from approximately 3,500 in 2009 to 6,000 in 2012. Factors related to use or the scheduling of airspace, however, have not adversely affected the training environment.

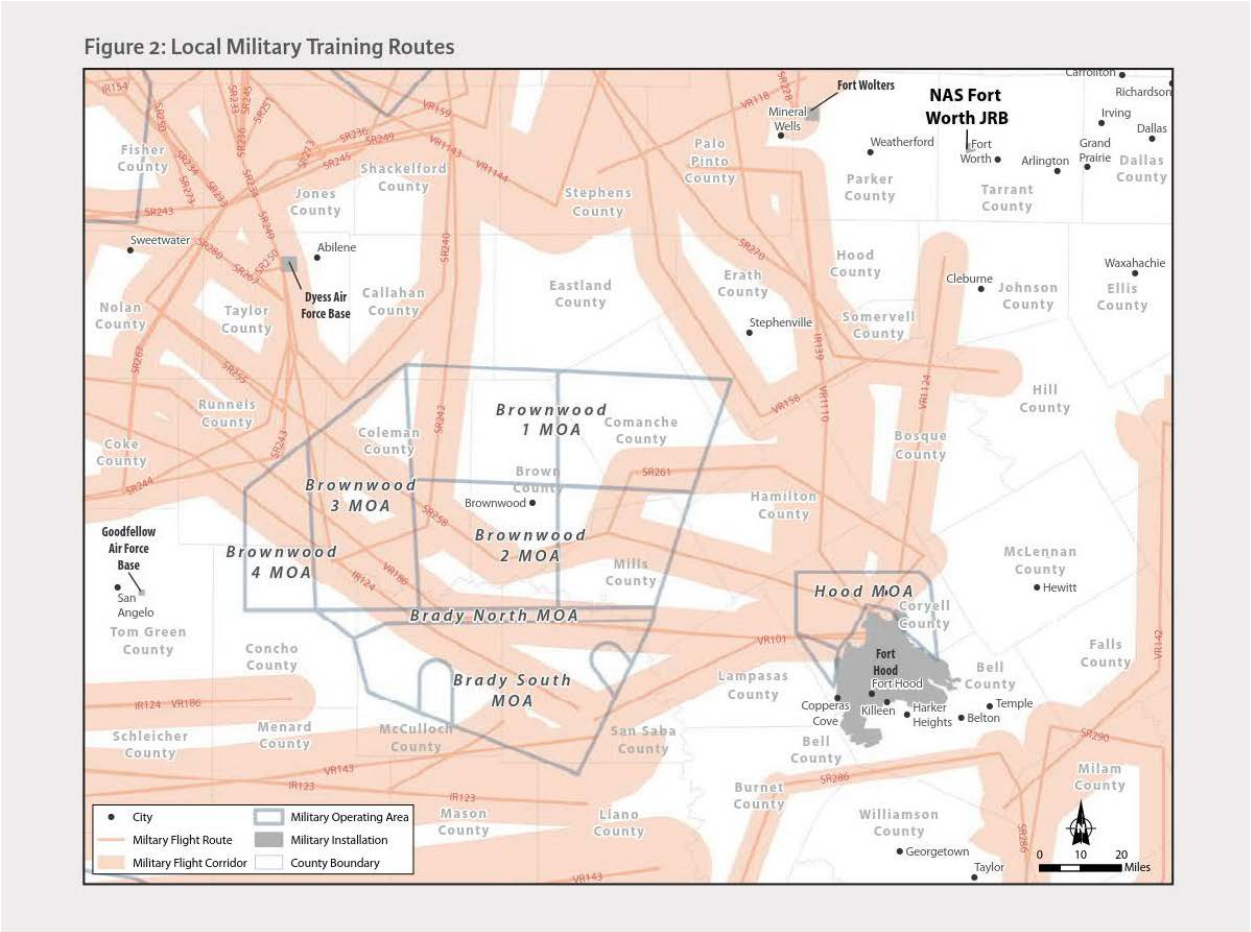
Training airspace is prone to noise and flight obstruction compatibility challenges. Participating aircraft can generate noise that affects nearby communities, particularly during low altitude exercises or supersonic flight operations. The Brady and Brownwood MOAs allow for supersonic flight, which produces a distinctive percussive boom as the aircraft travels in excess of the speed of sound. Aircraft can also be vulnerable to physical intrusions, such as tall structures in low-level corridors or radar interference from wind turbines. These issues suggest opportunities for additional community outreach and consultation processes to coordinate on energy infrastructure development.

Figure 17. Brownwood and Brady MOAs



Source: Community Planning and Liaison Officer Mike Branum, NAS Fort Worth JRB

Figure 18. Local Military Training Routes



9. Community Profiles

A variety of land use tools, specifically zoning, growth management policies, subdivision regulations, and transportation plans assist local governments in promoting compatibility with nearby military installations. The following analysis reviews the major existing policy documents for *Joining Forces* communities, with specific attention to:

- Specific development standards that require compatible development between the local community and nearby installations or airfields;
- Flexible subdivision or planned developments;
- Specific performance-based codes that regulate the development characteristics of development and redevelopment, such as sound attenuation;
- Broad land use strategies that can direct infill development and reduce greenfield development and lessen the exposure to military operational impacts due to installation proximity;
- Economic development policies that will affect the growth and development around the installations; and
- Master Thoroughfare Plans or other transportation plans that will direct future transportation priorities and networks.

9.1 Overview of Community Plans and Regulatory Policy – NAS Fort Worth, JRB

The following is a summary of general growth trends, compatibility issues, and existing compatibility tools, such as specific military overlay districts for communities surrounding NAS Fort Worth, JRB. **Table 7** lists the plans and regulatory codes analyzed.

Table 7. NAS Fort Worth, JRB Community Plans and Codes

Geographic Area Covered	Title
City of Benbrook	City of Benbrook Comprehensive Plan
City of Benbrook	City of Benbrook "NAS" Overlay District
City of Fort Worth	City of Fort Worth Comprehensive Plan
City of Fort Worth	City of Fort Worth Airport/Airfield Overlay District
City of Lake Worth	City of Lake Worth Comprehensive Plan Vision Report
City of River Oaks	City of River Oaks Comprehensive Plan Vision Report
City of River Oaks	City of River Oaks Existing and Future Zoning Map
City of Sansom Park	City of Sansom Park Comprehensive Plan Vision Report
Town of Westover Hills	Town of Westover Hills Zoning Ordinance
City of Westworth Village	City of Westworth Village Zoning Ordinance
City of White Settlement	City of White Settlement Comprehensive Plan Vision Report
NCTCOG	Planning for Livable Military Communities Regional Vision Report
NCTCOG	Joint Land Use Study Report (JLUS)
Tarrant County	Guidelines for Development in Unincorporated Areas
Dallas-Fort Worth Metropolitan Area	Mobility 2040
North Texas Metropolitan	Vision North Texas: North Texas 2050

Geographic Area Covered	Title
Statistical Area	
City of River Oaks	SH 199 Master Plan
City of River Oaks	SH 183 Corridor Master Plan
City of Fort Worth	Fort Worth Mobility and Air Quality (MAQ) Plan

9.1.1 City of Benbrook

The City of Benbrook is approximately two miles southwest of NAS Fort Worth, JRB. In 2014, Benbrook had a population of 21,898.[11] The city is generally a quiet, residential community. Benbrook Lake, a major recreational amenity in southwestern Tarrant County, forms the southern border and is a major natural amenity for the community.

The zoning regulations reflect the community's overall low-density, single-family, and primarily suburban character. Zoning focuses commercial development along Benbrook Boulevard (U.S. 377) and limits industrial activity to the north side of I-20. The high number of parkland acres in the southern portion of the city reflects the proximity of Benbrook Lake.

The city has been an active partner in promoting compatibility with NAS Fort Worth, JRB. In 2014, Benbrook adopted the "NAS" Overlay District to encourage compatible uses in areas with noise exposure of 65 dB or higher based on the most recently adopted AICUZ for the installation. In addition to the zoning restrictions contained within the underlying district, the ordinance requires sound attenuation for uses such as schools, religious facilities, museums, and libraries and prohibits one- and two-family dwellings and multi-family units. Exceptions to the residential prohibition include one-, two- or multiple-family dwellings constructed or occupied on the date of ordinance adoption, or any existing platted lot that is zoned for one-,

[11] 2014 ACS 5-Year Community Survey, U.S. Census Bureau

two- or multiple-family dwellings provided that construction methods achieve an inside sound level reduction of 30 dB.

Adopted in 2010, Benbrook's Comprehensive Plan outlines future development priorities for the city. The development principles seek a balance of new structures and protection of existing neighborhoods. The Future Land Use plan for Benbrook indicates that much of the city will retain it low-density single-family character, particularly to the north and south. Further, the intersection of Benbrook Boulevard and I-20 will remain a commercial and medium-density residential node. The development around Benbrook Lake will be community facilities and parks, notably Dutch Branch Park and Holiday Park.

9.1.2 City of Fort Worth

According to the 2015 census estimates, Fort Worth has a population of 833,319, making it the western population anchor of the DFW region. The base noise footprint covers a large geographic area of western Fort Worth, generally north and south of NAS Fort Worth, JRB.

Adopted in 2016, Fort Worth's Comprehensive Plan focuses on the development of higher-density residential and mixed uses. The goals put a priority on growth that supports transit-oriented development and urban villages—clusters of denser, walkable development throughout the city. As the population of Fort Worth increases, the city will encourage residential development/redevelopment that is more urban, walkable, and transitional between lower-density residential. More than 70 percent of the city's 350 square miles is developed. The city has seen strong residential growth in recent years and anticipates that future development will focus along I-35W in the north, Chisolm Trail Parkway to the south, and the planned TEX Rail commuter rail line, which will connect downtown Fort Worth to the Dallas-Fort Worth International Airport. Generally, much of the city's future growth is in areas where flight altitudes are high enough to minimize noise exposure.

Fort Worth has implemented strong regulatory tools to protect community safety and the operational integrity of the base. The Comprehensive Plan calls for the avoidance of residential and higher-density mixed uses in the APZs of NAS Fort Worth, JRB. In 2013, the city adopted an Airport Overlay District and Compatible Use Zone sub-districts for land falling in the CZs and north and south APZs. The districts limit the concentration of people and govern the height of structures to minimize airspace hazards. Other provisions add development standards and guidelines to restrict uses that cause electrical interference with navigational signals or radio communications, create glare or excessive lighting, produce emissions, or attract birds and other wildlife.

Fort Worth City Council adopted the Mobility and Air Quality Plan in 2009 to prepare for an increased population and the resulting impacts on traffic congestion, mobility, and air quality. The plan proposes commuter rails that would meet in downtown Fort Worth: the Johnson County Corridor line would travel south to Cleburne; the Aledo-Fort Worth corridor would travel westward to Aledo (south of I-30); the Fort Worth-Denton corridor would travel northeast to Denton; the Fort Worth-Midlothian corridor would travel southeast to Midlothian; the Fort Worth–Dallas line would travel eastward to Dallas (south of I-30); and the southwest-northwest corridor would connect downtown to Dallas-Fort Worth International Airport.

9.1.3 City of Lake Worth

The City of Lake Worth is north of NAS Fort Worth, JRB on the north banks of Lake Worth, a major regional amenity. In 2014, the city had a population of 4,671 people. Portions of the APZs extend to the north from the airfield at NAS Fort Worth, JRB into the city.

Lake Worth consists of predominantly single-family residential uses in its northern and western areas. Large pockets of commercial uses are found south of Azle Avenue and north of SH 199 (Lake Worth Boulevard). Industrial uses are north of SH 199 and west of I-820.

The city is approximately 2.5 square miles in size and is generally built out with a stable population but an expanding commercial base along its major corridors. Future land uses show some additional residential in the south and north, and a greater concentration of commercial uses near Azle Boulevard and SH 199. Lake Worth also has a major mixed use development proposal.

Adopted in 2013, Lake Worth's Comprehensive Plan notes that the proximity of NAS Fort Worth, JRB creates noise and air safety challenges for development in the city. The Lake Worth Comprehensive Plan Vision Report (2013) encourages development/redevelopment to be compatible with base operations. In June 2013, the City Council adopted development standards that call for increased sound attenuation for structures within the noise contour.

9.1.4 City of River Oaks

The City of River Oaks is east of NAS Fort Worth, JRB and abuts the City of Fort Worth to its east and northeast. River Oaks is approximately 1.9 square miles in area, and has no ETJ due to its proximity to other cities. The city boundary is outside of the minimum 65 dB of noise contours related to aviation at NAS Fort Worth, JRB.

The city began as a bedroom community due to its proximity to Carswell AFB. Over the years, it remained a prime location for installation personnel. However, most of the housing stock dates from the late 1940s. River Oaks works very closely with NAS Fort Worth, JRB to promote new businesses in the community and improve housing opportunities. The city has cited some challenges related to drainage along SH 183 and the surface condition and capacity of Meandering Road and the Roberts Cut Off Road/River Oaks Boulevard area.

Commercial development in River Oaks concentrates along the River Oaks Boulevard (SH 183) corridor. This route is a major arterial for base traffic. Castleberry Athletic Complex/YMCA Camp Carter is near NAS Fort Worth, JRB. Camp Carter sits on roughly 350 acres along the

Trinity River, and includes an equestrian center and horseback riding area, as well as baseball and softball fields for the Castleberry Independent School District

Over 70 percent of the city consists of single-family housing, while commercial activity makes up nearly six percent of the existing land area. The majority of zoning in River Oaks is residential with commercial structures along River Oaks Boulevard and Roberts Cut Off Road.

Currently, the city is nearly built out, meaning that developmental changes can only occur through redevelopment of existing commercial and residential properties. As redevelopment occurs, the city plans to incorporate noise reduction construction elements. Any anticipated future development growth will likely locate adjacent to the Trinity River, which stretches from Camp Carter to the River Oaks Water Plant.

Mobility 2040: The Metropolitan Transportation Plan for North Central Texas identifies SH 199, a major arterial in the city, as a funded improvement corridor to receive complete streets infrastructure components, including sidewalk improvements, bicycle lanes, shared use paths, transit stops, designated bus lanes, and pedestrian crossings. Recent Master Plans for both SH 199 and SH 183 outline revitalization options and mobility improvements for these aging corridors. The Cities of Sansom Park and River Oaks view the redevelopment of the corridors as essential first steps in the revitalization of their communities, providing new and more attractive places to live for military personnel.

9.1.5 City of Sansom Park

Sansom Park is northeast of NAS Fort Worth, JRB and directly north of the City of River Oaks. As of 2014, the city had a population of 4,825 residents. Commercial uses concentrate along Jacksboro Highway (SH 199), which connects the city to I-820 in the north and SH 183 to the south.

Nearly 63 percent of the city's existing land use is residential with 17 percent remaining vacant. Plans call for the development of land within the city limits north of Rosen Park on the east side, outside of noise-affected areas. Future land uses in Sansom Park will remain mostly single-family residential with some planned development south of SH 199 and west of Skyline Drive adjacent to Heartland Health Care Center-Fort Worth. Redevelopment, particularly commercial uses, will cluster along Jacksboro Highway and Azle Avenue. The city is outside of the minimum 65 dB noise contour of NAS Fort Worth, JRB but residents may still experience noise from military aircraft.

As in River Oaks, SH 199 is a major arterial in Sansom Park and Mobility 2040 identifies it as a funded improvement corridor to receive complete streets infrastructure components. The SH 199 Corridor Master Plan also outlines overall corridor improvements.

9.1.6 Town of Westover Hills

The Town of Westover Hills is approximately 1.5 miles southeast of NAS Fort Worth, JRB with a 2014 population of 718 residents. At only 0.7 of a square mile, the city is dominated by single-family residential development. The existing demographics, small land area, and land use mix reflect a stable, upscale residential enclave with minimal future growth. Westover Hills abuts the noise contours of NAS Fort Worth, JRB. However, most of the town is outside of the minimum noise contours of 65 dB. Variance requirements and ordinances, in general, require development to be consistent with the town's current large-lot residential character.

9.1.7 City of Westworth Village

The City of Westworth Village is on the banks of the Trinity River, five miles west of downtown Fort Worth. In 1941, the same year construction began on the base, the Westworth Village incorporated. According to 2014 census estimates, the City of Westworth Village has a population of 2,541 people. Just over 20 percent of its current total land acreage is single-

family housing and approximately 29 percent reflects existing parks and open space. The majority of Westworth Village's single-family housing is within the eastern portion of the city. Commercial land use is on SH 183, which connects NAS Fort Worth, JRB to the City of Westworth Village.

Portions of the city are within the CZ and APZs I and II, and fall within all noise contours from 65 to 85 dB. Anticipated future development and commercial growth are likely to be along Westworth Boulevard (SH 183) near Roaring Springs Road. In addition, single-family residential is also planned near Westworth Boulevard (SH 183) and McNaughton Lane. Planned commercial development along east Westworth Boulevard falls within the 65 to 70 dB noise contours of the base. Additionally, any residential development north of Westworth Boulevard and west of McNaughton Lane partially falls within the 65 dB noise contours.

The current zoning states that the city shall consider the appropriateness of all uses, construction standards, and dimensional standards (including height) of any property, which may be within the AICUZ of NAS Fort Worth, JRB. The city has also amended its code to adopt the 2012 Edition of the International Building Code, which provides for greater structural energy efficiency, as well as better indoor sound attenuation.

9.1.8 City of White Settlement

The City of White Settlement is at the western edge of Fort Worth at the intersection of I-820 and I-30. The catalysts for the city's growth include the establishment of Carswell AFB, the development of the commercial industry in Fort Worth, and the construction of the Dallas-Fort Worth International Airport. The city, with a population of 16,116, is known for its family-friendly park facilities and neighborhoods that cater to residents and personnel who work at Lockheed Martin and NAS Fort Worth, JRB.

Single-family residential land use makes up nearly 40 percent of the city with commercial comprising about 11 percent of land use. The majority of White Settlement's retail and commercial land uses are along the southern edge of the city and along Cherry Lane and White Settlement Road. Currently, most of the existing land use is in the 65 to 85 dB DNL noise contours of NAS Fort Worth, JRB. The majority of the vacant land is in the southwestern portion of the city adjacent to I-30 and I-820.

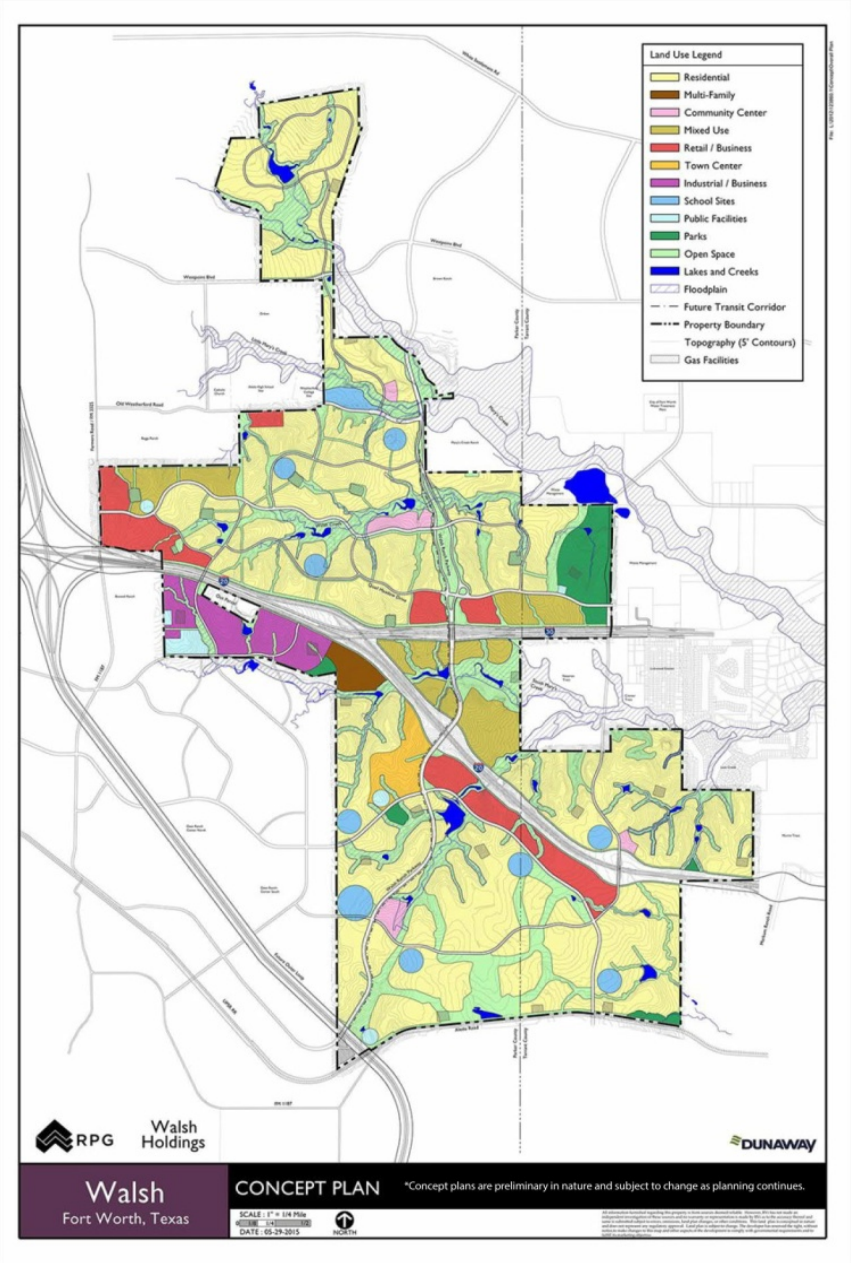
9.1.9 Tarrant County

Tarrant County organized in the 1850s with a population around 660, which is 2,700 times smaller than the approximate 1.8 million residents today. The county is home to Fort Worth—one of the region's and nation's fastest growing cities—and includes many fast-growing suburbs. While it is seeing rapid growth, Tarrant County does not have the authority to implement or enforce zoning, development, or building codes in its unincorporated areas. If a city has adopted building and development codes in its ETJ, then the city's regulations apply in those areas. In addition to its proximity to NAS Fort Worth, JRB, the county is also near the Eagle Mountain Training Center along the northern portion of Eagle Mountain Lake and the Colonel Stone Army Reserve Center, off White Settlement Road in the western portion of the county.

Tarrant County is seeing redevelopment along Camp Bowie West Boulevard. Strong growth also continues to the west of Fort Worth. Walsh is a 7,267-acre mixed-use master plan site on I-30, 13 miles west of Fort Worth and approximately 11 minutes driving time from Lockheed Martin and NAS Fort Worth, JRB. The vision calls for nine million square feet of retail and office and a build-out of over 15,000 homes with an estimated population of over 50,000 people (See **Figure 19**). The plan envisions the site as a regionally significant research and technology hub and lifestyle center for North Texas. The grand opening is scheduled for April of 2017. Aircraft returning to NAS Fort Worth, JRB from training exercises in the Brady and Brownwood

MOAs to the southwest will fly over the community but at higher altitudes that should minimize noise exposure.

Figure 19. Walsh Concept Plan



9.2 Overview of Community Plans and Regulatory Policy – Redmond Taylor Army Heliport

The following is a summary of growth trends, compatibility issues, and existing compatibility tools for communities surrounding RTAHP. **Table 8** lists the plans and regulatory codes analyzed.

Table 8. RTAHP Community Plans and Codes

Geographic Area Covered	Title
Dallas, Texas	forwardDallas! Comprehensive Plan
Grand Prairie, Texas	City of Grand Prairie Comprehensive Plan
Grand Prairie, Texas	Unified Development Code
Dallas, Texas	Neighborhood Plus
Dallas, Texas	The GrowSouth Plan

9.2.1 City of Dallas

The RTAHP is in a far western portion of the City of Dallas. Dallas is the third largest city in Texas, behind Houston and San Antonio, and the ninth largest city in the United States. Adopted in 2006, forwardDallas! serves as a policy document for future development in the city and focuses on seven core elements: housing, land use, environment, transportation, neighborhoods, economic development, and urban design.

Trends indicate that Dallas will continue to attract new residents and jobs but will grow at a slower rate than suburbs and exurbs throughout the region. The city aims to expand homeownership and support denser and more diverse housing stock to increase the number of residents. Additionally, according to forwardDallas!, the areas of Dallas near RTAHP will see an

increase in both residential and commercial density. The southern sector of the city and areas near the heliport have the city's largest area of available land to support future development.

Adopted in 2015, the goal of Neighborhood Plus is to facilitate the development and maintenance of sustainable neighborhoods throughout Dallas. The plan outlines strategic goals, including alleviating poverty, fighting blight, attracting and retaining the middle class, expanding homeownership, and enhancing rental options.

Dallas neighborhoods adjacent to the installation are part the City's GrowSouth Plan. This initiative is a comprehensive strategy to create sustainable growth in the southern portions of Dallas. The city seeks to make the southern area a focal point of development investment and population growth. With successful implementation of this plan, the neighborhoods closest to RTAHP could experience population increases, new commercial development, and an influx of jobs.

The City of Dallas owns the RTAHP complex and leases facilities to the current military tenants. Officials have cited challenges with infrastructure maintenance on the site and the connection of former on-installation systems to existing municipal services. Given that the land comprises the single largest redevelopment site in Dallas, the city has explored re-use opportunities. There are no current long-term plans for re-use of the facility but the city continues to evaluate all options. The property would be likely to continue in an industrial or industrially-compatible use.

9.2.2 City of Grand Prairie

Grand Prairie is in far western Dallas County and far eastern Tarrant County just west of the City of Dallas. According to the Grand Prairie Future Land Use map, the areas closest to RTAHP are expected to remain residential. Large areas of the northern parts of the city are floodplain and marshland, constraining future development. Grand Prairie has access to two large lakes –

Joe Pool Lake and Mountain Creek Lake. Joe Pool Lake offers ample recreational opportunities, including parks and water activities.

Adopted in 2010, Grand Prairie's Comprehensive Plan serves as a 20-year plan to guide growth and development. The city aims for development that contains a mix of land in support of sustainable economic growth and a range of opportunities for living, recreation, shopping, and business. Development in Grand Prairie will focus south of I-30 and along Joe Pool Lake and Mountain Creek Lake. According to the Plan, most residents currently live north of Joe Pool Lake, indicating that future development growth will occur to the south. In addition, the city has prioritized retaining access to recreational amenities. There are no explicit policies in the Plan addressing compatibility with RTAHP. Grand Prairie officials have expressed interest in greater communication on installation activities and long-term plans for the complex.

9.3 Overview of Community Plans and Regulatory Policy – Fort Wolters

Fort Wolters affects the City of Mineral Wells and Palo Pinto County. Parker County officials indicated minimal interaction and compatibility issues with the installation. The following is a summary of plans and growth priorities for the City of Mineral Wells. Given the rural nature of the area, Palo Pinto and Parker Counties do not have comprehensive or strategic plans. **Table 9** lists the plans and regulatory codes analyzed.

Table 9. Fort Wolters Community Plans and Codes

Geographic Area Covered	Title
Mineral Wells	Discover Downtown: A Development Plan for Historic Downtown Mineral Wells

9.3.1 City of Mineral Wells

Mineral Wells has a rich history as a destination, beginning as a resort community due to the presence of mineral springs in the area. As of 2014, 15,362 residents lived in the city. In 2015, Mineral Wells released a downtown redevelopment plan in part to capitalize on the reinvestment opportunity associated with the historic Baker Hotel. Upon successful implementation of the plan, the city core will serve as a growth catalyst with a pedestrian-oriented square, urban park, and an outdoor event center. No current city planning documents address compatibility with Fort Wolters.

Mineral Wells also provides tax and other incentives to industrial businesses seeking relocation. Potential locations for development include land north of the Fort Wolters business park. Other opportunities are in the southern portions of the city. The city is near the Wolters Industrial Park, formerly a part of the military installation. Rural, unincorporated county land is closer to active military operations.

The city owns and operates Mineral Wells Airport, a public use aviation facility about three miles from the central business district and readily accessible from SH-180 and I-20. The airport serves primarily general aviation aircraft. The 6,000-foot main runway supports large aircraft operations, such as the Boeing 737, DC-9, and the Lockheed Hercules C-130, as well as corporate jets and other general aviation and military aircraft.

Mineral Wells actively supports the military mission and city leaders have indicated support for any potential expanded operations at Fort Wolters.

9.4 Overview of Community Plans and Regulatory Policy – Camp Maxey

Camp Maxey affects several communities in Lamar County, including the City of Paris and the unincorporated area of Powderly. Given its predominantly rural nature, Lamar County lacks comprehensive or strategic planning documents. **Table 10** lists the plans and regulatory codes analyzed.

Table 10. Camp Maxey Community Plans and Codes

Geographic Area Covered	Title
City of Paris	Code of Ordinances
Northeast Texas/Western Arkansas	Ark-Tex Regional Public Transit Coordination Plan

9.4.1 Community of Powderly

Powderly is a small, census-designated community in unincorporated Lamar County, north of Paris, Texas and 4.5 miles south of the Oklahoma border. This predominately rural, agricultural area has a population of approximately 1,100 residents and is the closest to Camp Maxey training operations among Lamar County's communities.

9.4.2 City of Paris

In 2014, the population in the City of Paris was 25,023. The city is a major contributor to railroad operations, livestock, and agriculture in Lamar County. Paris is in the process of

developing a major trail network throughout the county, known as Trail de Paris, which will connect to other amenities in the area, such as parks and lakes.

The existing land use in Paris is largely low-density residential. Land use to the west of the city is a mix of parks and recreation, light industrial, and low-density residential. Residential is primarily within the central portion of the city, north and south of U.S. 82. Most of the city is built out. However, there are infill opportunities and areas throughout the city that are available for development.

Cox Field Airport, which is the former airbase for Camp Maxey, is on a 1,600-acre site adjacent to U.S. 271 approximately five miles east of Paris. Cox Field opened in August of 1943 for use by the U.S. Army Air Forces as a training base but reverted to the City of Paris at the end of the war. This TXDOT/City of Paris aviation asset is currently undergoing improvements and will assist with fixed or rotary wing landings. The Kiamichi Railroad (KRR), part of the Genesee Wyoming companies, connects to the BNSF, Kansas City Southern, and Union Pacific lines. KRR is interested in placement of a rail head for Camp Maxey to accommodate the freight moveement needs of the installation.

10. Other Study Area Partners

Along with the military installations and local governments, other stakeholders play a key role in promoting compatibility in the *Joining Forces* region.

10.1 Lockheed Martin

The Lockheed Martin facility adjacent to NAS Fort Worth, JRB shares the installation runway for manufacturing and testing activities. Lockheed Martin is a leading global aerospace, security, and innovation company. The firm has 13,700 employees with a $1.4 billion payroll.

In 2001, Lockheed Martin won the design competition for the X-35 in the Joint Strike Fighter Program. The X-35 has now evolved into the current F-35 Lightning II program. The F-35 Lightning II is a 5th Generation fighter, combining advanced stealth capabilities and technology with fighter aircraft speed and agility. In August 2016, the U.S. Air Force announced that the new squadron of F-35A Aircraft achieved Initial Operational Capability (IOC). This is the second plane in the F-35 Lighting II program to reach IOC. Over the program lifecycle, Lockheed Martin will produce three variants of the aircraft: F-35A, F-35B, and F-35C. The aircraft will gradually replace many of the current fighter aircraft used by the U.S. Air Force, U.S. Navy, U.S. Marine Corps, and other partner countries.

The Lockheed Martin facility has transitioned to a high rate of Joint Strike Fighter production. After $1 billion in investments, the plant will produce one aircraft per day or approximately 17 per month. Along with production, Lockheed Martin conducts flight testing, which can generate noise impacts on surrounding areas, particularly during aircraft hovering. Lockheed Martin faces encroachment challenges similar to NAS Fort Worth, JRB, including concerns related to wind turbines, lighting, and UAS operations.

Source: Lockheed Martin

11. Community and Stakeholder Engagement

11.1 Stakeholder Interviews

In addition to Policy Committee meetings and document review, the planning team conducted face-to-face or telephone interviews with key stakeholders in the public, private, and community sectors to establish priorities for the study, gather data, and identify challenges and opportunities for further study. Stakeholders represented the following entities:

- City of Benbrook
- City of Dallas
- City of Fort Worth
- City of Grand Prairie
- City of Lake Worth
- City of Mineral Wells and Palo Pinto County
- City of Paris and Lamar County
- City of River Oaks
- City of Westworth Village
- City of White Settlement
- Parker County
- Tarrant County
- Natural Resources Conservation District
- Lockheed Martin
- Naval Air Station Fort Worth, JRB
- Fort Wolters
- Camp Maxey

- Redmond Taylor Army Heliport
- Ark-Tex Council of Governments
- Texas Parks & Wildlife Department
- U.S. Army Corps of Engineers

Stakeholders cited a wide variety of themes and issues, including:

- Strong support for the military mission in surrounding communities and an understanding of the positive economic impact of the installations;
- Relatively few complaints related to existing noise or operational impacts with the exception of specific pockets of noise sensitivity particularly near RTAHP; but recognition that residential turnover and infill opportunities could bring new residents unfamiliar with military operations near active operations;
- Existing mutual aid agreements for emergency response;
- Potential for increasing infill development and land use transitions in mature communities to introduce incompatibilities even within stable built out areas;
- Lack of county regulatory tools to address even modest growth in rural areas;
- Strong westward growth trajectory within the region;
- Effectiveness of existing coordination mechanisms, such as the RCC Development Review Web Tool and ongoing base outreach around NAS Fort Worth, JRB;
- Successful implementation of zoning overlay tools around NAS Fort Worth, JRB in the Cities of Benbrook and Fort Worth;
- Absence of formal channels of communication and coordination outside of the NAS Fort Worth, JRB portion of the region and a desire for increased military-civilian outreach in communities surrounding RTAHP, Camp Maxey, and Fort Wolters;
- Need for strategies to address emerging challenges related to energy infrastructure especially in unincorporated areas and UAS operations near airfields; and

- Support for additional compatibility measures such as real estate disclosure.

11.2 Public Input Opportunities

The JLUS is an inclusive, community-driven process that seeks to engage a broad cross-section of residents, workers, local businesses, community groups, landowners, and local and state governments. Major input opportunities include large format meetings and online content and exercises available on the project website: www.JoiningForcesNTX.org/.

The planning team conducted four public meetings in Grand Prairie, River Oaks, Paris, and Mineral Wells in August 2016. The meetings were part of the initial phase of community outreach conducted for the study designed to introduce the JLUS planning process and identify critical issues in the *Joining Forces* region. Facilitators asked participants to prioritize a list of initial compatibility concerns related to:

- Noise from aircraft
- Noise from training ranges
- Development near installation
- Aviation safety
- Use of airspace (e.g., general aviation aircraft or unmanned aerial systems/drones)
- Tall structures in low-level aircraft routes (communication towers, gas wells, wind turbines and transmission lines)
- Frequency spectrum interference (e.g. radio communication)
- Installation/facility perimeter security
- Recreational access/public use of military land
- Drainage/flooding
- Light pollution/glare
- Circulation/traffic access around installation

- Wildfire
- Water resources
- Environmental resources
- Endangered species and critical habitat
- Cultural resources (e.g., historic sites)
- Coordination/Communication between military and community
- Accommodating military-related growth

Participants also identified any additional issues not listed among the initial factors and indicated the location of issues on base maps. Attendees at the Mineral Wells meeting near Fort Wolters highlighted minor compatibility issues related to development near the installation, the effect of tall structures on aviation, and the presence of cultural resources. They also stressed a desire to accommodate expanded operations at Fort Wolters.

Residents around NAS Fort Worth, JRB in attendance at the River Oaks meeting noted compatibility issues stemming from local stormwater/flooding, development around the base, and circulation and traffic access. Attendees also expressed support for continued military-related growth in the surrounding communities.

At the Camp Maxey meeting in Paris, participants highlighted issues related to transportation access around the installation, as well as nearby development. Given limited attendance and input at the RTAHP meeting, the planning team will be conducting additional outreach in the Grand Prairie and Dallas areas.

The planning team and Policy Committees will draw from input received at these meetings and throughout the process to refine study findings and recommendations. A summary document of public involvement will include additional detail on meeting activities and results.

Technical Appendix D.

Public Involvement Summary

Joining Forces Stakeholder Interviews

Lockheed Martin

Parker County

Westworth Village

City of Grand Prairie

Natural Resources Conservation Service

Palo Pinto County

City of Mineral Wells

Fort Worth

Lake Worth

Ark-Tex COG

City of Benbrook

City of River Oaks

City of White Settlement

Tarrant County

Lake Mineral Wells State Park

Lamar County

City of Paris

U.S. Army Corps of Engineers

City of Dallas

Technical Appendix E.

Land Use Compatibility Assessment Memo

A Joint Land Use Study (JLUS) promotes compatible growth in communities that neighbor military installations. The land-use analysis conducted for this JLUS documents the progress neighboring communities have made since a JLUS was completed for Naval Air Station Fort Worth, Joint Reserve Base in 2008.

Following the 2008 study, the communities that neighbor the base came together to protect the base's mission by:

- Forming the Regional Coordination Committee, which includes city and county elected officials and staff who meet quarterly with base leadership;
- Developing the Development Review Web Tool to address the compatibility of planned growth or land-use changes (see the Assessment and Recommendations for RCC Development Review Tool); and
- Creating zoning overlays to encourage compatible growth in the base's safety zones and noise contours.

Federal agencies, as well as state and local governments, are required by the Noise Control Act of 1972 to take steps to prevent noise from harming people. The Department of Defense's Air Installation Compatible Use Zones (AICUZ) program recommends land uses that will prevent noise, safety, or obstruction conflicts with communities that neighbor military air installations. These efforts also aim to protect installations from incompatible growth that could impede the military mission1.

The Texas Legislature created Tarrant County in 1849, and Fort Worth was incorporated as a city in 1873. The city initially had 500 residents. An oil boom beginning in 1917 led to population growth in and around the city. Growth continued at an explosive pace in the years following World War I, and the construction of the reservoir Lake Worth was completed in

[1] Department of Defense Instruction Number 4165.57, May 2, 2011 Incorporating Change 1, Effective March 12, 2015, http://www.dtic.mil/whs/directives/corres/pdf/416557p.pdf

1916. An aircraft plant and a military airfield that later became Carswell Air Force Base were built near Lake Worth during World War II. Naval Air Station Fort Worth, Joint Reserve Base (NAS Fort Worth, JRB) opened in 1994 on the site of the former Carswell Air Force Base. The aircraft plant is now Lockheed Martin Aeronautics Company[2].

Past Development

Much of the development in the AICUZ boundaries predates noise control legislation and military guidance on compatible growth, which date to the 1970s[3] (**Figure 1**). The populations of the cities that neighbor NAS Fort Worth, JRB have continued to grow since the completion of the 2008 JLUS. The City of Fort Worth has grown by 17 percent from 2009 to 2015[4], according to the U.S. Census Bureau's American Community Survey 5-Year Estimates. Some of this growth resulted from annexation in areas not impacted by the installation. The combined growth of the other cities neighboring the installation was 2 percent from 2009 to 2015. Land in the cities continues to be developed or redeveloped. Data on development dates was acquired from Tarrant Appraisal District (**Figure 2** and **Figure 3**[5]**)**.

[2] Fort Worth History, http://fortworthtexas.gov/about/history/

[3] Department of Defense Instruction 4165.57 of 8 Nov 1977 and the Noise Control Act of 1972, 42 U.S.C. 4901 {et Seq.}

[4] 2009 was used because the American Community Survey does not provide data from 2008 that is comparable to 2015, the most recent year for which data is available.

[5] Parcel data in Figures 1-3 was acquired from Tarrant Appraisal District. This data is for informational purposes and may not have been prepared for or be suitable for legal, engineering, or surveying purposes. They do not represent an on-the-ground survey and represent only the approximate relative location of property boundaries.

Figure 1

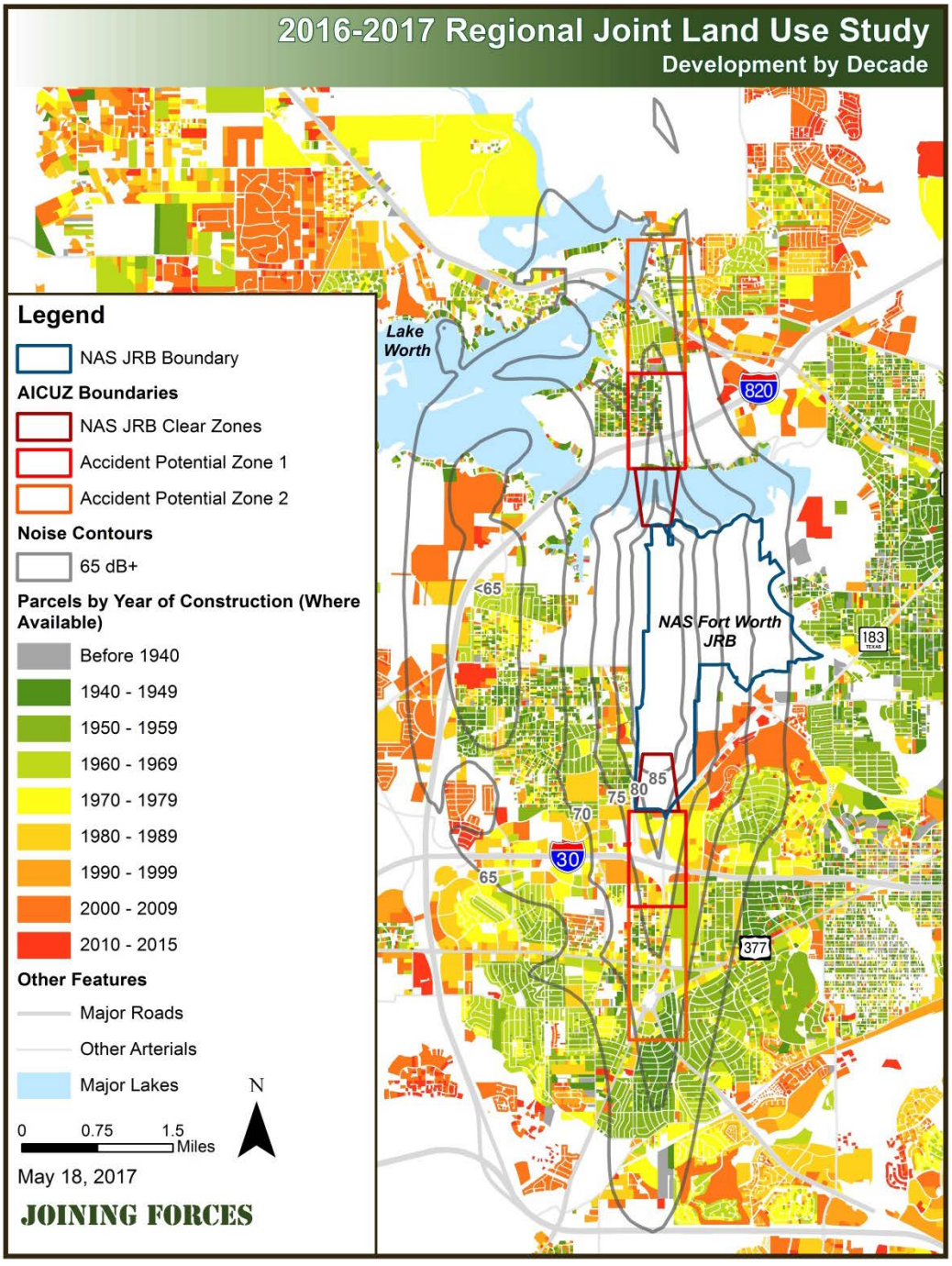

2016-2017 Regional Joint Land Use Study
Development by Decade
Legend
NAS JRB Boundary
AICUZ Boundaries
NAS JRB Clear Zones
Accident Potential Zone 1
Accident Potential Zone 2
Noise Contours
65 dB+
Parcels by Year of Construction (Where Available)
Before 1940
1940 - 1949
1950 - 1959
1960 - 1969
1970 - 1979
1980 - 1989
1990 - 1999
2000 - 2009
2010 - 2015
Other Features
Major Roads
Other Arterials
Major Lakes
N
0 0.75 1.5 Miles
May 18, 2017
JOINING FORCES
Lake Worth
NAS Fort Worth JRB
820
30
183
377
65
70
75
80
85

Figure 2

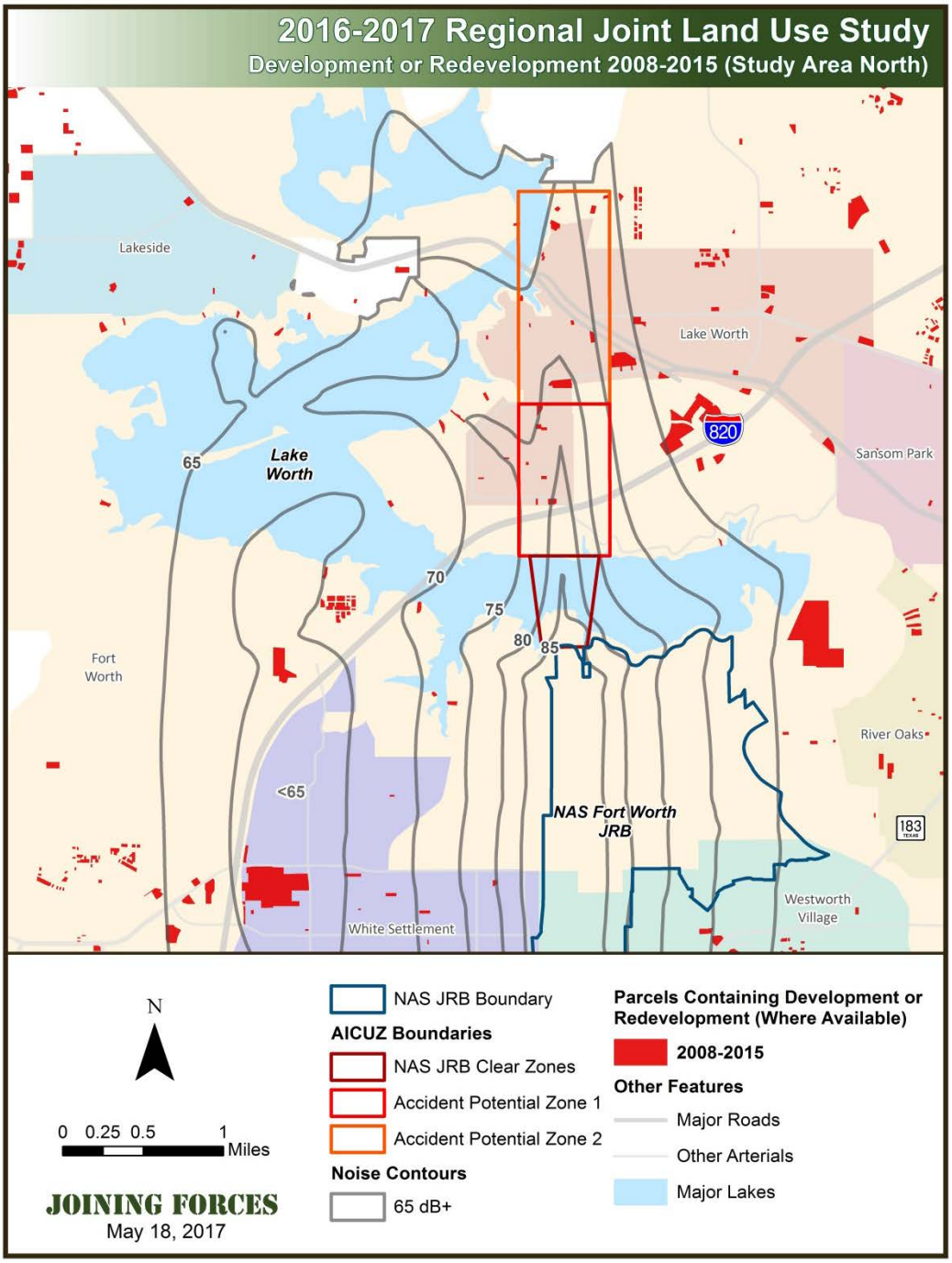
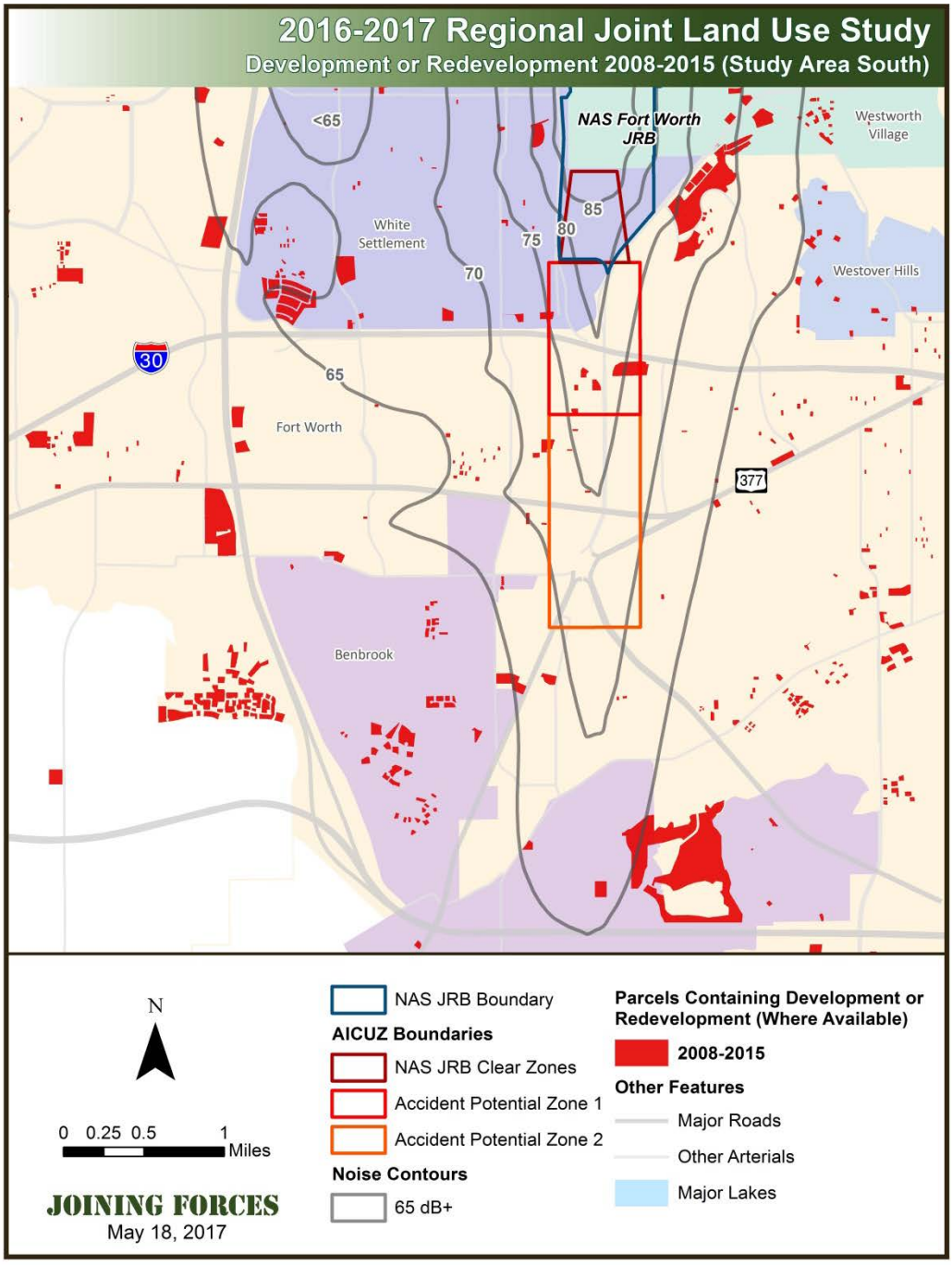

2016-2017 Regional Joint Land Use Study
Development or Redevelopment 2008-2015 (Study Area North)
Lakeside
Lake Worth
820
Sansom Park
65
Lake Worth
70
75
80
85
Fort Worth
River Oaks
<65
NAS Fort Worth JRB
183
Westworth Village
White Settlement
N
0 0.25 0.5 1
Miles
JOINING FORCES
May 18, 2017
NAS JRB Boundary
AICUZ Boundaries
NAS JRB Clear Zones
Accident Potential Zone 1
Accident Potential Zone 2
Noise Contours
65 dB+
Parcels Containing Development or Redevelopment (Where Available)
2008-2015
Other Features
Major Roads
Other Arterials
Major Lakes

Figure 3


2016-2017 Regional Joint Land Use Study
Development or Redevelopment 2008-2015 (Study Area South)
<65
NAS Fort Worth JRB
Westworth Village
White Settlement
85
80
75
70
Westover Hills
30
65
Fort Worth
377
Benbrook
N
0 0.25 0.5 1
Miles
JOINING FORCES
May 18, 2017
NAS JRB Boundary
AICUZ Boundaries
NAS JRB Clear Zones
Accident Potential Zone 1
Accident Potential Zone 2
Noise Contours
65 dB+
Parcels Containing Development or Redevelopment (Where Available)
2008-2015
Other Features
Major Roads
Other Arterials
Major Lakes

City Ordinances and Other Compatibility Efforts

The 2008 JLUS recommended cities adopt ordinances to create an NAS Fort Worth, JRB overlay district to manage growth and guide land use. Two cities that neighbor the installation developed such ordinances in subsequent years.

The City of Fort Worth includes land that falls in all of the safety zones and noise contours. In 2013, the city adopted an ordinance that added airport/airfield overlay zones and compatible use zones restrictions for incompatible uses within clear zones and accident potential zones for all aviation facilities in the city, including NAS Fort Worth, JRB. The area affected by this ordinance is shown in **Figure 4**.

In 2014, the City of Fort Worth adopted a revision to the 2013 ordinance that addressed NAS Fort Worth, JRB specifically. The updated ordinance addresses siting of communications facilities, as well as outdoor lighting and glare. The area affected by this ordinance is shown in **Figure 4**.

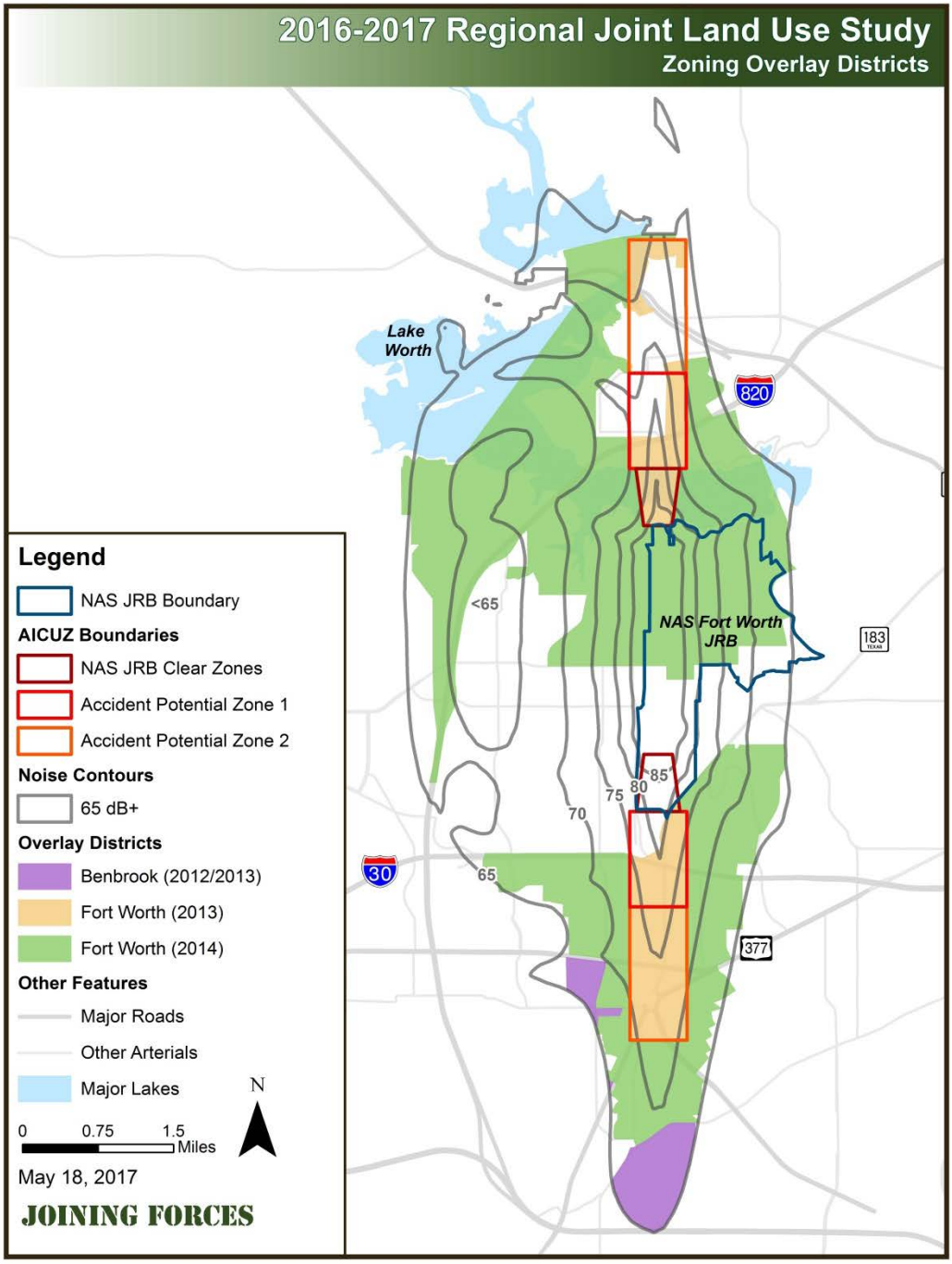
The City of Fort Worth also adopted an ordinance in 2016 that amended Appendix L of the city's Building Code requiring sound insulation for noise sensitive users near airports. Details on building materials for windows, walls, doors, and roof/ceiling are addressed. The Building Code requirements cover all portions of the city that fall within AICUZ noise contours.

The City of Benbrook includes land that falls in the 65-69 decibel noise contour. In 2013, the city adopted an ordinance that created an overlay district to provide land uses that are compatible with aircraft operations at NAS Fort Worth, JRB. The ordinance permits new educational, religious, and cultural land uses within the noise contour only if sound attenuation is used that reduces inside sound levels by 25 decibels. The ordinance prohibits new development of one-family, two-family, and multi-family dwellings; the construction or reconstruction of these residential land uses is only allowed if the dwellings were constructed,

occupied, or platted by the date of the ordinance and sound attenuation is used to reduce inside sound levels by 30 decibels. The area affected by this ordinance is shown in **Figure 4**.

Another recommendation of the 2008 JLUS was the formation of a regional committee to monitor future land use impacts. The Naval Air Station Fort Worth Regional Coordination Committee was formed and meets at least quarterly; the committee created an online Development Review Tool to generate discussion on the compatibility of potential land uses changes in the AICUZ. The tool is described in more detail in the appendix Assessment and Recommendations for RCC Development Review Tool.

Figure 4


2016-2017 Regional Joint Land Use Study
Zoning Overlay Districts
Lake Worth
820
NAS Fort Worth JRB
183
<65
85
80
75
70
65
30
377
Legend
NAS JRB Boundary
AICUZ Boundaries
NAS JRB Clear Zones
Accident Potential Zone 1
Accident Potential Zone 2
Noise Contours
65 dB+
Overlay Districts
Benbrook (2012/2013)
Fort Worth (2013)
Fort Worth (2014)
Other Features
Major Roads
Other Arterials
Major Lakes
N
0 0.75 1.5 Miles
May 18, 2017
JOINING FORCES

Current Land Use

Land uses within the AICUZ and in the areas that neighbor the installation are shown in **Figure 5**. This 2015 land use data was provided by NCTCOG's Research & Information Services (RIS) department, which compiles and analyzes information on development in the North Central Texas region. RIS land use codes were first developed based on United States Geological Survey classifications, but have since been revised to suit local needs, according to the NCTCOG 2010 Land use Code Methodology. These land uses were aggregated for this analysis to reduce the number of categories and improve readability of the figures. These aggregations are as follows:

- Residential: Includes Single Family, Multi Family, Mobile Home, and Group Quarters
- Residential Acreage: Includes Residential Acreage (land that is mostly undeveloped, yet includes a residence)
- Commercial: Includes Commercial, Office, Retail, Hotel/Motel, and Mixed Use
- Industrial: Includes Industrial and Landfill
- Institutional or Education: Includes Institutional/Semipublic and Education
- Transportation or Infrastructure: Includes Roadway, Utilities, Railroad, Communication, Transit, Airport, Runway, Flood Control, and Parking
- Parks or Recreation: Includes Parks/Recreation
- Ranch Land or Agriculture: Includes Farm Land, Ranch Land, Timber Land, and Improved Acreage
- Water: Includes Small and Large Water Bodies
- Vacant or Under Construction: Includes undeveloped land as identified by parcel state land use code and land under construction as identified through aerial photography and other NCTCOG data.

The percentage of total land area within the noise contours and safety zones are quantified for each aggregated land use in **Table 1** and **Figures 6-7**. Residential property decreases as a percentage of total land area as the contours increase in decibel level and as accident potential increases. Infrastructure, including the NAS Fort Worth, JRB runway and airport infrastructure, increases as a percentage of total area as the contours increase in decibel level and as accident potential increases. Industrial land uses generally also show an increase as decibel levels increase. 2015 land use for areas where land use changed between 2005 and 2015 are shown in **Figure 8**.

Figure 5

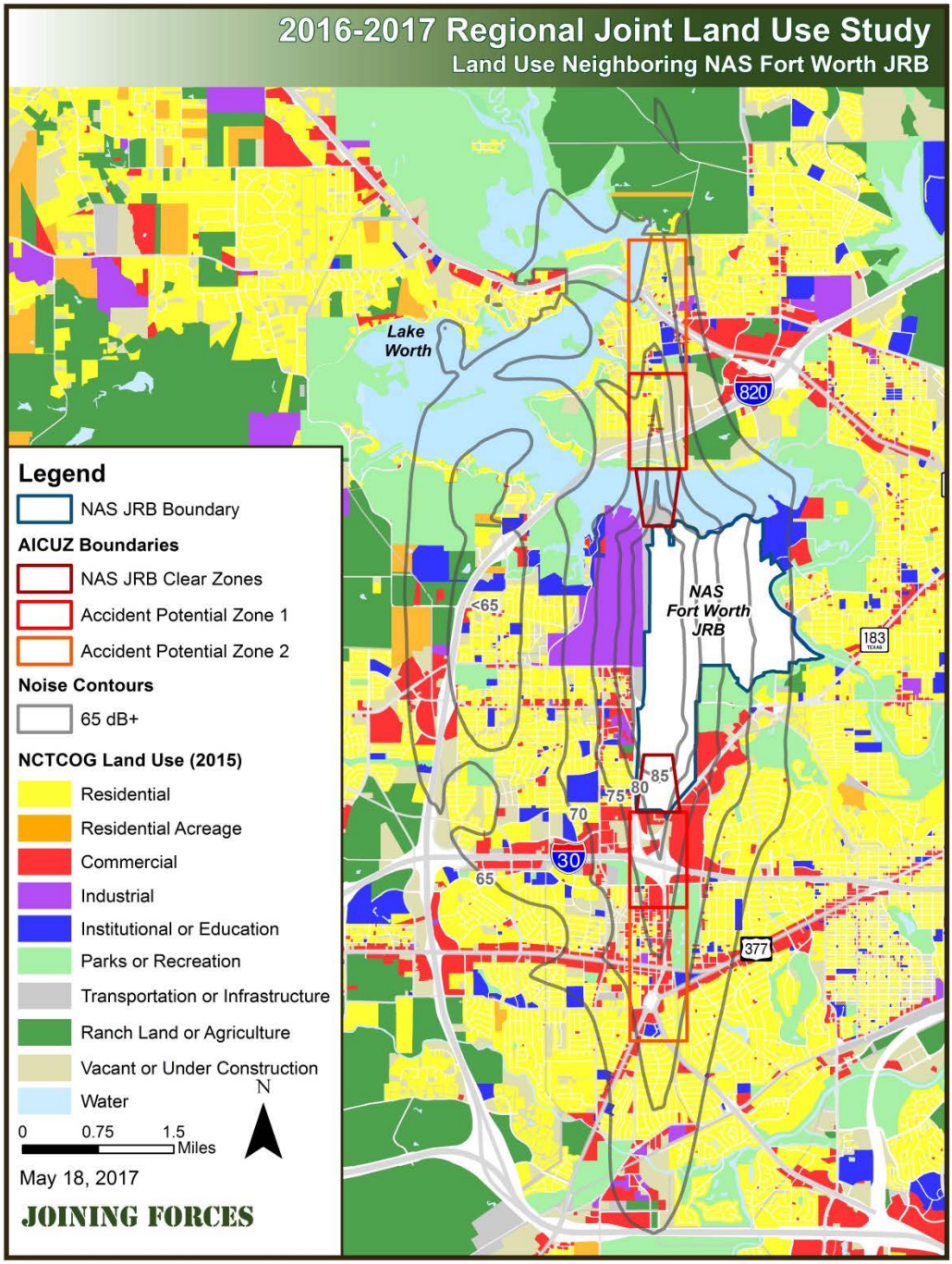

2016-2017 Regional Joint Land Use Study
Land Use Neighboring NAS Fort Worth JRB
Lake Worth
NAS Fort Worth JRB
820
183
30
377
<65
65
70
75
80
85
Legend
NAS JRB Boundary
AICUZ Boundaries
NAS JRB Clear Zones
Accident Potential Zone 1
Accident Potential Zone 2
Noise Contours
65 dB+
NCTCOG Land Use (2015)
Residential
Residential Acreage
Commercial
Industrial
Institutional or Education
Parks or Recreation
Transportation or Infrastructure
Ranch Land or Agriculture
Vacant or Under Construction
Water
N
0
0.75
1.5
Miles
May 18, 2017
JOINING FORCES

Table 1

	65db	70db	75db	80db	85db	APZ II	APZ I	CZ
Residential	24.50%	21.03%	12.40%	2.55%	0.00%	27.26%	14.84%	0.71%
Residential Acreage	1.04%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Commercial	7.49%	10.87%	16.96%	7.05%	0.10%	14.28%	20.11%	0.94%
Industrial	1.21%	3.32%	13.89%	21.19%	10.97%	1.26%	0.00%	0.00%
Institutional	8.20%	10.33%	2.57%	0.00%	0.00%	6.84%	0.19%	0.00%
Infrastructure	24.20%	26.66%	38.16%	59.17%	88.34%	35.33%	55.83%	63.24%
Parks/Recreation	11.69%	12.06%	6.77%	0.74%	0.00%	7.87%	7.28%	0.04%
Agriculture/Ranching	3.68%	0.60%	0.21%	0.79%	0.00%	0.12%	0.74%	0.00%
Water	17.99%	15.13%	9.04%	8.52%	0.59%	7.04%	1.00%	35.07%
Total	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%

Figure 6

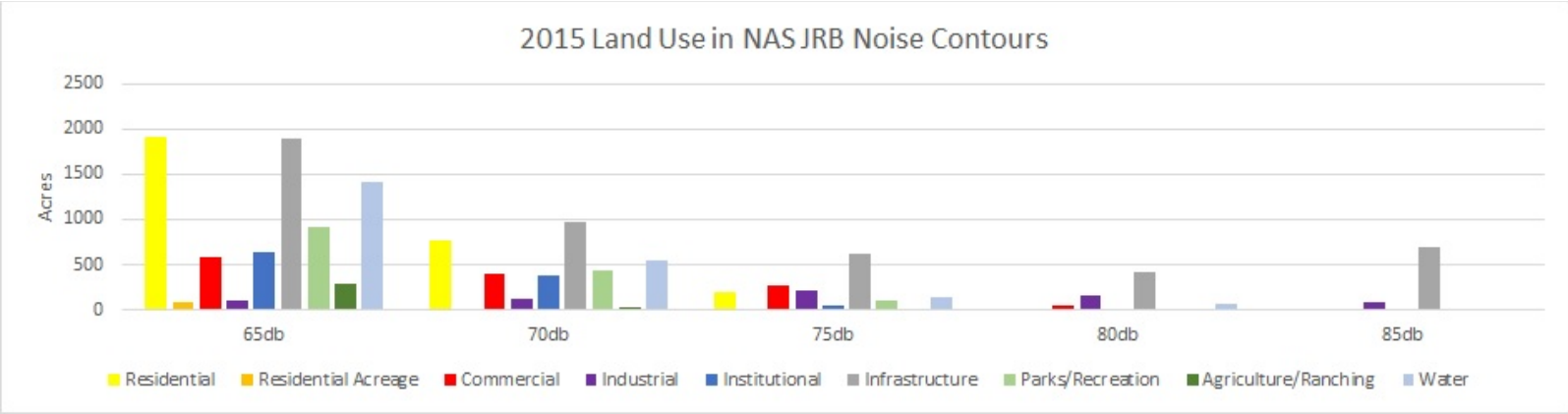


Figure 7

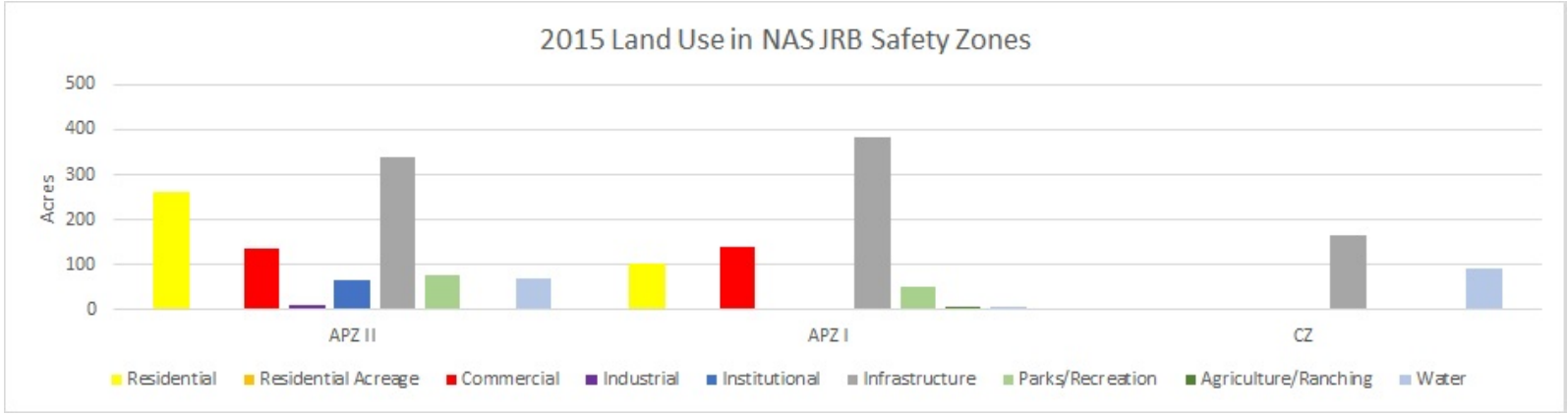
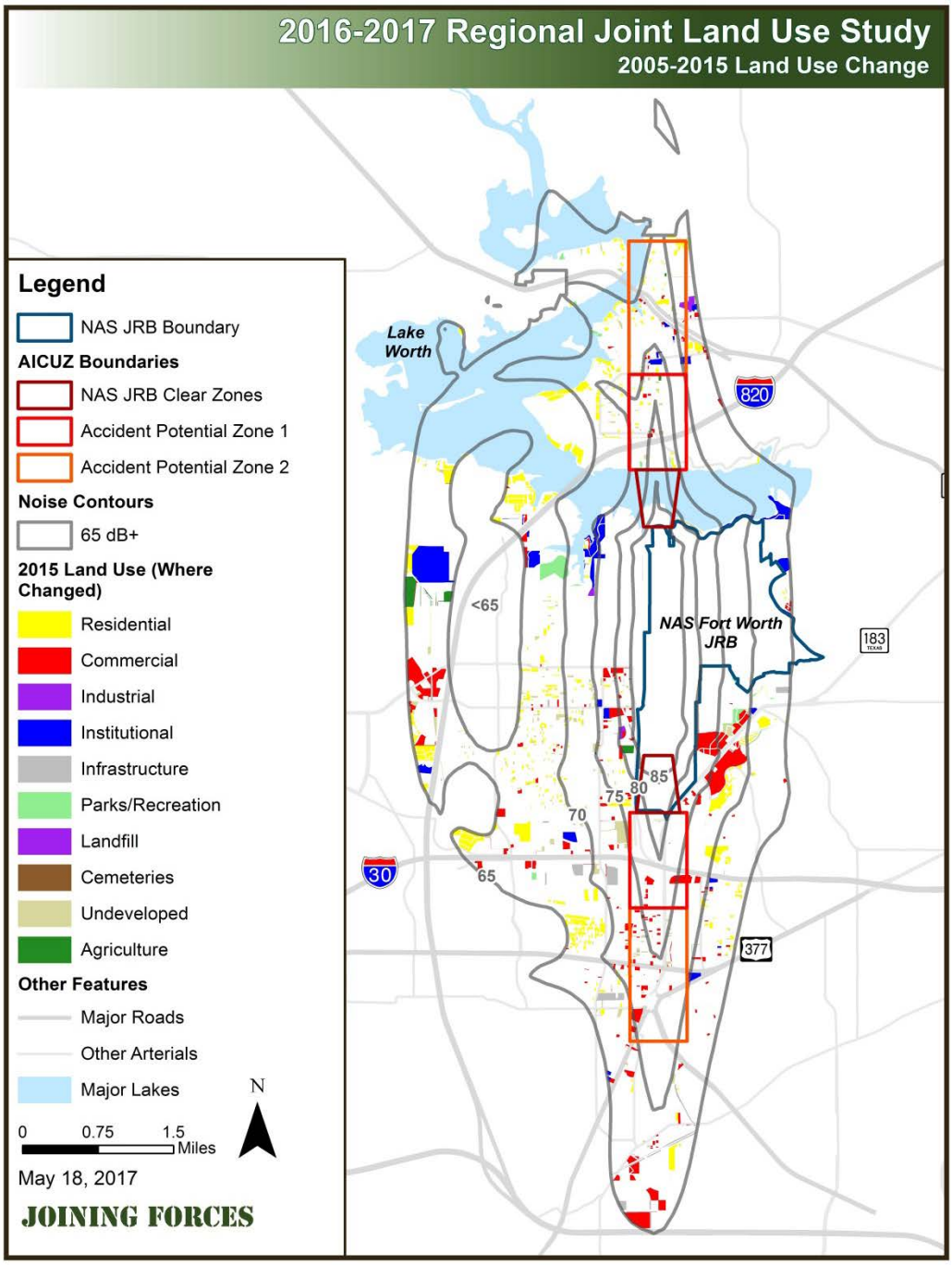


Figure 8


2016-2017 Regional Joint Land Use Study
2005-2015 Land Use Change
Legend
NAS JRB Boundary
AICUZ Boundaries
NAS JRB Clear Zones
Accident Potential Zone 1
Accident Potential Zone 2
Noise Contours
65 dB+
2015 Land Use (Where Changed)
Residential
Commercial
Industrial
Institutional
Infrastructure
Parks/Recreation
Landfill
Cemeteries
Undeveloped
Agriculture
Other Features
Major Roads
Other Arterials
Major Lakes
0 0.75 1.5 Miles
N
May 18, 2017
JOINING FORCES
Lake Worth
NAS Fort Worth JRB
820
183
30
377
<65
65
70
75
80
85

Compatibility Analysis

The Department of Defense designates specific land uses in the AICUZ as compatible, incompatible, or compatible if conditions are met, such as sound attenuation or local need. The Department of Defense applies these compatibility categories to Standard Land Use Coding Manual (SLUCM) land uses. The compatibility of SLUCMs in the noise contours are shown in **Table 2**.

NCTCOG sought to identify increases or decreases in the compatibility of land that has changed use from 2005 to 2015. For the purposes of this analysis, SLUCM land uses were assigned to the RIS land uses they most closely matched (**Table 3**). Because the land use codes used by RIS changed from 2005 to 2015, efforts also were made to match 2005 land uses to the 2015 land uses with which they best corresponded. Based on the compatibility designations in **Table 2**, maps were generated showing increases and decreases in compatibility for areas within the AICUZ that changed land uses (**Figures 9-10**). In all of the noise contours, the changes showed a mix of decreasing and increasing compatibility.

The same analysis was conducted for the safety zones: the Clear Zones (CZ), Accident Potential Zones I (APZ I), and Accident Potential Zones II (APZ II). **Table 4** shows the Department of Defense-determined compatibility for SLUCMs in the safety zones. **Figures 11-12** show changes in compatibility in the safety zones. The majority of land use changes in the APZ IIs resulted in an increase in compatibility, except for some changes that took place along the shore of Lake Worth. The land use changes in both Accident Potential Zone Is showed a mix of decrease and increase in compatibility. No land use changes occurred in the Clear Zones.

Table 2

OPNAVINST 11010.36C MCO 11010.16

9 Oct 2008

AIR INSTALLATIONS COMPATIBLE USE ZONES
SUGGESTED LAND USE COMPATIBILITY IN NOISE ZONES

Land Use		Suggested Land Use Compatibility						
		Noise Zone 1 *(DNL or CNEL)*		Noise Zone 2 *(DNL or CNEL)*		Noise Zone 3 *(DNL or CNEL)*		
SLUCM NO	LAND USE NAME	< 55	55- 64	65- 69	70 -74	75- 79	80-84	85+
10	***Residential***							
11	Household Units	Y	Y[1]	N[1]	N[1]	N	N	N
11.11	Single units, detached	Y	Y[1]	N[1]	N[1]	N	N	N
11.12	Single units, semidetached	Y	Y[1]	N[1]	N[1]	N	N	N
11.13	Single units: attached row	Y	Y[1]	N[1]	N[1]	N	N	N
11.21	Two units, side-by-side	Y	Y[1]	N[1]	N[1]	N	N	N
11.22	Two units, one above the other	Y	Y[1]	N[1]	N[1]	N	N	N
11.31	Apartments: walk-up	Y	Y[1]	N[1]	N[1]	N	N	N
11.32	Apartment: elevator	Y	Y[1]	N[1]	N[1]	N	N	N
12	Group quarters	Y	Y[1]	N[1]	N[1]	N	N	N
13	Residential Hotels	Y	Y[1]	N[1]	N[1]	N	N	N
14	Mobile home parks or courts	Y	Y[1]	N	N[1]	N	N	N
15	Transient lodgings	Y	Y[1]	N[1]	N[1]	N[1]	N	N
16	Other residential	Y	Y[1]	N[1]	N[1]	N	N	N
20	***Manufacturing***							
21	Food & kindred products; manufacturing	Y	Y	Y	Y[2]	Y[3]	Y[4]	N
22	Textile mill products; manufacturing	Y	Y	Y	Y[2]	Y[3]	Y[4]	N
23	Apparel and other finished products; products made from fabrics, leather and similar materials; manufacturing	Y	Y	Y	Y[2]	Y[3]	Y[4]	N
24	Lumber and wood products (except furniture) ; manufacturing	Y	Y	Y	Y[2]	Y[3]	Y[4]	N
25	Furniture and fixtures; manufacturing	Y	Y	Y	Y[2]	Y[3]	Y[4]	N
26	Paper and allied products; manufacturing	Y	Y	Y	Y[2]	Y[3]	Y[4]	N
27	Printing, publishing, and allied industries	Y	Y	Y	Y[2]	Y[3]	Y[4]	N
28	Chemicals and allied products; manufacturing	Y	Y	Y	Y[2]	Y[3]	Y[4]	N
29	Petroleum refining and related industries	Y	Y	Y	Y[2]	Y[3]	Y[4]	N

AIR INSTALLATIONS COMPATIBLE USE ZONES
SUGGESTED LAND USE COMPATIBILITY NOISE ZONES (Continued)

Land Use		Suggested Land Use Compatibility						
		Noise Zone 1 *(DNL or CNEL)*		Noise Zone 2 *(DNL or CNEL)*		Noise Zone 3 *(DNL or CNEL)*		
SLUCM NO	LAND USE NAME	< 55	55- 64	65- 69	70 -74	75-79	80-84	85+
30	***Manufacturing (Continued)***							
31	Rubber and misc. plastic products; manufacturing	Y	Y	Y	Y[2]	Y[3]	Y[4]	N
32	Stone, clay and glass products; manufacturing	Y	Y	Y	Y[2]	Y[3]	Y[4]	N
33	Primary metal products; manufacturing	Y	Y	Y	Y[2]	Y[3]	Y[4]	N
34	Fabricated metal products; manufacturing	Y	Y	Y	Y[2]	Y[3]	Y[4]	N
35	Professional scientific, and controlling instruments; photographic and optical goods; watches and clocks	Y	Y	Y	25	30	N	N
39	Miscellaneous manufacturing	Y	Y	Y	Y[2]	Y[3]	Y[4]	N
	Transportation, Communication and utilities							
41	Railroad, rapid rail transit, and street railway transportation	Y	Y	Y	Y[2]	Y[3]	Y[4]	N
42	Motor vehicle transportation	Y	Y	Y	Y[2]	Y[3]	Y[4]	N
43	Aircraft transportation	Y	Y	Y	Y[2]	Y[3]	Y[4]	N
44	Marine craft transportation	Y	Y	Y	Y[2]	Y[3]	Y[4]	N
45	Highway and street right-of-way	Y	Y	Y	Y[2]	Y[3]	Y[4]	N
46	Automobile parking	Y	Y	Y	Y[2]	Y[3]	Y[4]	N
47	Communication	Y	Y	Y	25[5]	30[5]	N	N
48	Utilities	Y	Y	Y	Y[2]	Y[3]	Y[4]	N
49	Other transportation, communication and utilities	Y	Y	Y	25[5]	30[5]	N	N
50	***Trade***							
51	Wholesale trade	Y	Y	Y	Y[2]	Y[3]	Y[4]	N
52	Retail trade - building materials, hardware and farm equipment	Y	Y	Y	Y[2]	Y[3]	Y[4]	N
53	Retail trade - shopping centers	Y	Y	Y	25	30	N	N
54	Retail trade - food	Y	Y	Y	25	30	N	N
55	Retail trade - automotive, marine craft, aircraft and accessories	Y	Y	Y	25	30	N	N
56	Retail trade - apparel and accessories	Y	Y	Y	25	30	N	N

Land Use		Suggested Land Use Compatibility						
		Noise Zone 1 *(DNL or CNEL)*		Noise Zone 2 *(DNL or CNEL)*		Noise Zone 3 *(DNL or CNEL)*		
SLUCM NO	LAND USE NAME	< 55	55- 64	65- 69	70 -74	75-79	80-84	85+
57	Retail trade - furniture, home, furnishings and equipment	Y	Y	Y	25	30	N	N
58	Retail trade - eating and drinking establishments	Y	Y	Y	25	30	N	N
59	Other retail trade	Y	Y	Y	25	30	N	N
60	***Services***							
61	Finance, insurance and real estate services	Y	Y	Y	25	30	N	N
62	Personal services	Y	Y	Y	25	30	N	N
62.4	Cemeteries	Y	Y	Y	Y[2]	Y[3]	Y[4,11]	Y[6,11]
63	Business services	Y	Y	Y	25	30	N	N
63.7	Warehousing and storage	Y	Y	Y	Y[2]	Y[3]	Y[4]	N
64	Repair Services	Y	Y	Y	Y[2]	Y[3]	Y[4]	N
65	Professional services	Y	Y	Y	25	30	N	N
65.1	Hospitals, other medical fac.	Y	Y[1]	25	30	N	N	N
65.16	Nursing Homes	Y	Y	N[1]	N[1]	N	N	N
66	Contract construction services	Y	Y	Y	25	30	N	N
67	Government Services	Y	Y[1]	Y[1]	25	30	N	N
68	Educational services	Y	Y[1]	25	30	N	N	N
69	Miscellaneous	Y	Y	Y	25	30	N	N
70	***Cultural, entertainment and recreational***							
71	Cultural activities (& churches)	Y	Y[1]	25	30	N	N	N
71.2	Nature exhibits	Y	Y[1]	Y[1]	N	N	N	N
72	Public assembly	Y	Y[1]	Y	N	N	N	N
72.1	Auditoriums, concert halls	Y	Y	25	30	N	N	N
72.11	Outdoor music shells, amphitheaters	Y	Y[1]	N	N	N	N	N
72.2	Outdoor sports arenas, spectator sports	Y	Y	Y[1]	Y[7]	N	N	N
73	Amusements	Y	Y	Y	Y	N	N	N
74	Recreational activities (include golf courses, riding stables, water rec. l	Y	Y[1]	Y[1]	25	30	N	N
75	Resorts and group camps	Y	Y[1]	Y[1]	Y	N	N	N
76	Parks	Y	Y[1]	Y[1]	Y	N	N	N
79	Other cultural, entertainment and recreation	Y	Y[1]	Y[1]	Y	N	N	N
80	***Resource Production and Extraction***							
81	Agriculture (except live stock)	Y	Y	Y[8]	Y[9]	Y[10]	Y[10,11]	Y[10,11]

AIR INSTALLATIONS COMPATIBLE USE ZONES

SUGGESTED LAND USE COMPATIBILITY IN NOISE ZONES (Continued)

Land Use		Suggested Land Use Compatibility						
		Noise Zone 1 *(DNL or CNEL)*		Noise Zone 2 *(DNL or CNEL)*		Noise Zone 3 (DNL or *CNEL)*		
SLUCM NO	LAND USE NAME	< 55	55- 64	65- 69	70 -74	75-79	80-84	85+
81.5	Livestock farming	Y	Y	Y^{8}	Y^{9}	N	N	N
81. 7	Animal breeding	Y	Y	Y^{8}	Y^{9}	N	N	N
82	Agriculture related activities	Y	Y	Y^{8}	Y^{9}	Y^{10}	$Y^{10,11}$	$Y^{10,11}$
83	Forestry Activities	Y	Y	Y^{8}	Y^{9}	Y^{10}	$Y^{10,11}$	$Y^{10,11}$
8-4	Fishing Activities	Y	Y	Y	Y	Y	Y	Y
85	Mining Activities	Y	Y	Y	Y	Y	Y	Y
89	Other resource production or extraction	Y	Y	Y	Y	Y	Y	Y

KEY TO TABLE 1 - SUGGESTED LAND USE COMPATIBILITY IN. NOISE ZONES

SLUCM	Standard Land Use Coding Manual, U.S. Department of Transportation
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^{x} (Yes with Restrictions)	The land use and related structures are generally compatible. However, see notes indicated by the superscript.
N^{x} (No with exceptions)	The land use and related structures are generally incompatible. However, see notes indicated by the superscript.
NLR (Noise Level Reduction)	NLR (outdoor to indoor) to be achieved through incorporation of noise attenuation into the design and construction of the structure.
25,30, or 35	The numbers refer to NLR levels. Land Use and related structures generally compatible however, measures to achieve NLR of 2 5, 30 or35 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
DNL	Day Night Average Sound Level.
CNEL	Community Noise Equivalent Level (normally within a very small decibel difference of DNL)
Ldn	Mathematical symbol for DNL.

NOTES - SUGGESTED LAND USE COMPATIBILITY IN NOISE ZONES

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 to 69 and strongly discouraged in DNL 70 to 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.

Where the community determines that these uses must be allowed measures to achieve and outdoor to indoor NLR of at least 25 Decibels (dB) in DNL 65 to 69 and NLR of 30 dB in DNL 70 to 74 should be incorporated into building codes and be in individual approvals; for transient housing a NLR of at least 35 dB should be incorporated in DNL 75 to 79.

b. Normal permanent construction can be expected to provide a NLR of 20 dB, thus the reduction requirements are often stated as 5, 10 or 15 dB over standard construction and normally assume mechanical ventilation, 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.

c. NLR criteria will not eliminate outdoor noise problems. However, building location and site planning, design and use of berms and barriers can help mitigate outdoor noise exposure NLR 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 must be incorporated into the design and construction of portions of these buildings where the public is received, office areas, noise sensitive areas or where the normal noise level is low.

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

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

the normal noise level is low.

5. If project or proposed development is noise sensitive, use indicated NLR; if not, land use is compatible without NLR.

6. No buildings.

7. Land use compatible provided special sound reinforcement systems are installed.

B. Residential buildings require a NLR of 25

9. Residential buildings require a NLR of 30.

10. Residential buildings not permitted.

11. Land use not recommended, but if the community decides use is necessary, hearing protection devices should be worn.

Table 3

RIS Land Use Code (COG_LU)	Category	Examples of Uses	OPNAV Land Use Code (SLUCM NO)	OPNAV Land Use Description	Comments
111	Single family	Single family detached units and duplexes	11.11	Single units, detached	
112	Multi-family	Apartments, condominiums, residential hotels, converted apartments and townhouses (single family attached)	11.31	Apartments: walk-up	
113	Mobile home	Mobile homes inside mobile home parks and free-standing units outside parks	14	Mobile home parks or courts	
114	Group quarters	Nursing homes, group homes, college dormitories, jails, military base personnel quarters	12	Group quarters	
120	Commercial	Unspecified office or retail uses or a combination of office and retail uses, excludes office and retail uses when residential use is present (see mixed use)	59	Other retail trade	
121	Office	Generally includes any administration functions include corporate and government offices, banks*	69	Miscellaneous (Services)	
122	Retail	Retail trade and services, such as department stores, repair shops, supermarkets, restaurants*	59	Other retail trade	
124	Hotel/motel	Hotels and motels	15	Transient lodgings	"Transient" refers to the non-permanent nature of hotel guests. Homeless shelters would fall under Group Quarters.
125	Institutional/ semi-public	Churches, governmental facilities and offices, museums, hospitals, medical clinics, libraries and military bases	67	Government Services	This RIS land use category is broad and matches to several OPNAV categories. Government Services represents the broadest section of these and has compatibility that falls in the middle of these options. The land upon which NAS Fort Worth JRB sits is classified this way but will be excluded from the analysis.
126	Education	All public and private schools	68	Educational services	
131	Industrial	Manufacturing plants, warehouses, office showrooms*	39	Miscellaneous manufacturing	

RIS Land Use Code (COG_LU)	Category	Examples of Uses	OPNAV Land Use Code (SLUCM NO)	OPNAV Land Use Description	Comments
142	Roadway	Roadways and right-of-ways*	45	Highway and street right-of-way	
143	Utilities	Sewage treatment and power plants, power line easements, pump stations, water treatment plants and water systems	48	Utilities	
144	Airport	Airport terminals*	43	Aircraft transportation	
146	Runway	Airport runways	43	Aircraft transportation	
147	Large stadium	Large venue for organized events	72.2	Outdoor sports arenas, spectator sports	
148	Railroad	Railroad lines and stations, rail to truck transfer facilities, freight only	41	Railroad, rapid rail transit, and street railway transportation	OPNAV makes no distinction between passenger and freight rail.
149	Communication	Radio and television communications stations	47	Communication	
151	Transit	Passenger rail and bus lines and facilities	41	Railroad, rapid rail transit, and street railway transportation	OPNAV makes no distinction between passenger and freight rail.
160	Mixed use	Areas that contain both commercial (office and retail) and residential uses either in the same facility or in very close proximity	16	Other residential	OPNAV has no classification for mixed use development. Matching this category to a general residential category due to the presumed presence of residences in these areas.
170	Parks/ recreation	Public and private parks, golf courses, public and private tennis courts and swimming pools, amusement parks	76	Parks	
172	Landfill	Sanitary landfills, land applications, and similar waste management facilities	48.5	Solid waste disposal (Landfills, incineration, etc.)	48.5 is present in the OPNAV CZ/APZ table but not in the Noise Zone table. Assumed to be equivalent to 48 (Utilities).
173	Under construction	Land that has undergone site preparation and construction has begun	91	Undeveloped Land	OPNAV does not have an equivalent classification, but undeveloped land may be a close fit. There is relatively little of this classifcaiton in the study area.

RIS Land Use Code (COG_LU)	Category	Examples of Uses	OPNAV Land Use Code (SLUCM NO)	OPNAV Land Use Description	Comments
174	Cemeteries	Dedicated burial places	62.4	Cemeteries	
181	Flood control	Major flood control structures including levies and flood channels	93	Water Areas	OPNAV does not have a flood control classification.
301	Vacant	Undeveloped land, can be either urban or rural	91	Undeveloped Land	
302	Residential acreage	Land that is mostly undeveloped, yet includes a residence, either house or mobile home, as a minor part of the use	11.11	Single units: detached	Single units: detached is the lowest density residential land use classification in OPNAV and is therefore the best match for this extremely low density residential classification.
303	Ranch land	Land that is either devoted or suited to raising of livestock	81.5	Livestock farming	
304	Timberland	Land that is wooded or forested	83	Forestry Activities	
305	Farmland	Land that is either devoted to or suited to cultivation of crops	81	Agriculture (except live stock)	
309	Improved acreage	Open land that has a non-residential structure	91	Undeveloped Land	OPNAV has no equivalent to this. The low level of development described by this classification means that Undeveloped Land fits best.
401	Parking	Paved areas dedicated to vehicle parking, includes parking structures	46	Automobile parking	
501	Water	Lakes, rivers, ponds of at least 10 acres	93	Water Areas	OPNAV does not split its water classification by size.
502	Small water bodies	Water bodies less than 10 acres	93	Water Areas	OPNAV does not split its water classification by size.

Figure 9

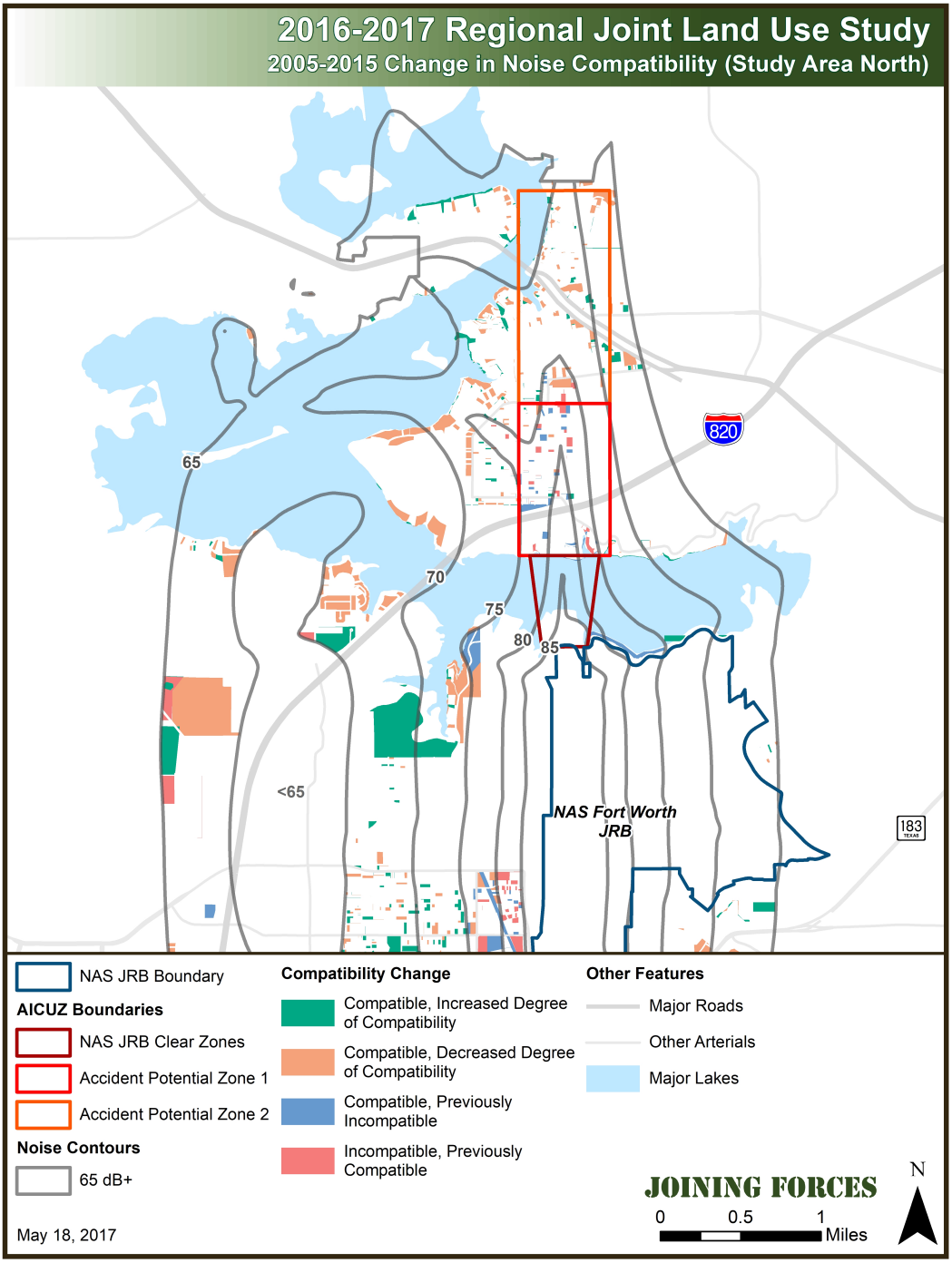

2016-2017 Regional Joint Land Use Study
2005-2015 Change in Noise Compatibility (Study Area North)
65
70
75
80
85
<65
820
183
NAS Fort Worth JRB
NAS JRB Boundary
AICUZ Boundaries
NAS JRB Clear Zones
Accident Potential Zone 1
Accident Potential Zone 2
Noise Contours
65 dB+
Compatibility Change
Compatible, Increased Degree of Compatibility
Compatible, Decreased Degree of Compatibility
Compatible, Previously Incompatible
Incompatible, Previously Compatible
Other Features
Major Roads
Other Arterials
Major Lakes
May 18, 2017
JOINING FORCES
0 0.5 1 Miles
N

Figure 10

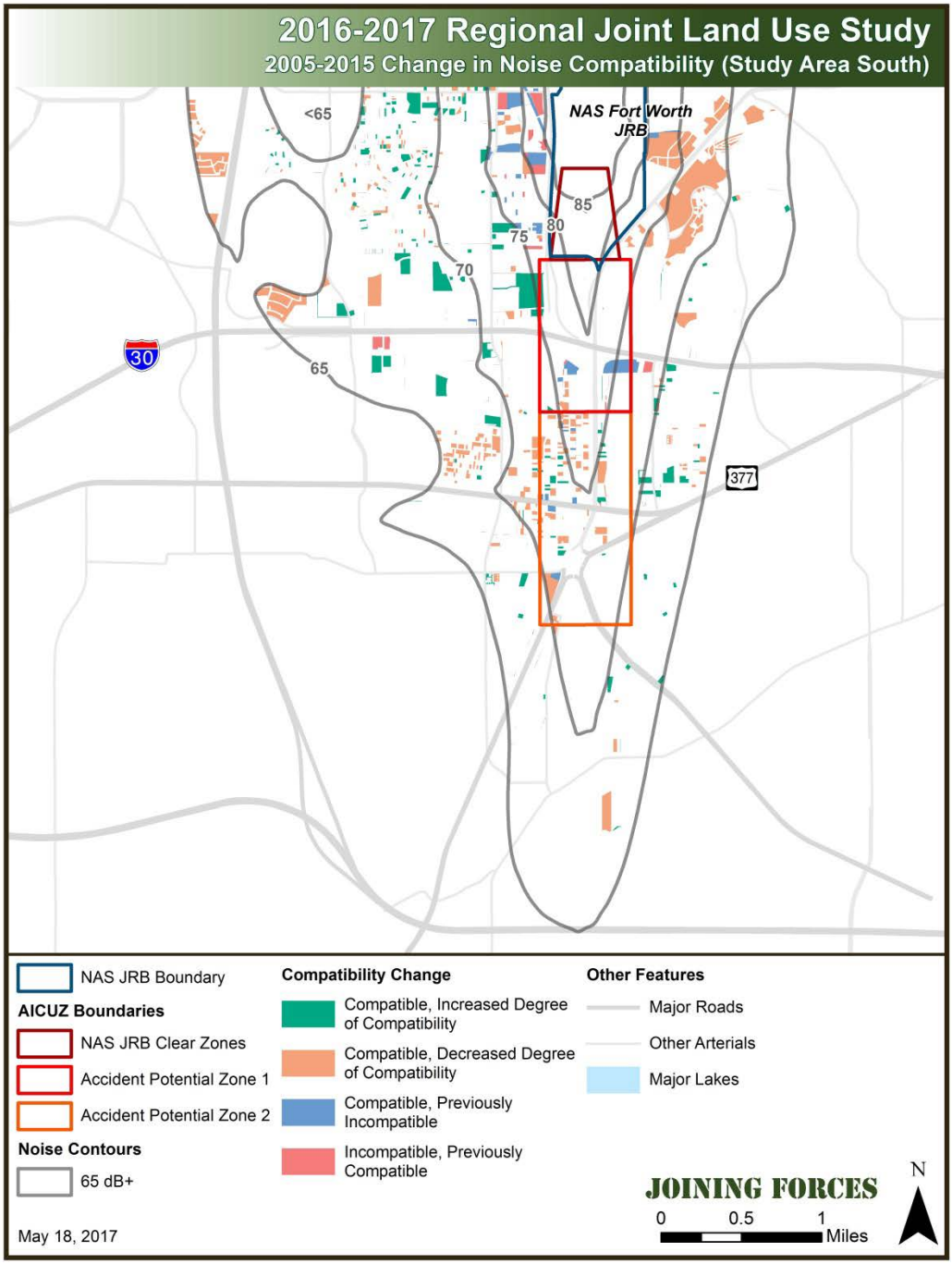

2016-2017 Regional Joint Land Use Study
2005-2015 Change in Noise Compatibility (Study Area South)
<65
NAS Fort Worth JRB
85
80
75
70
65
30
377
NAS JRB Boundary
AICUZ Boundaries
NAS JRB Clear Zones
Accident Potential Zone 1
Accident Potential Zone 2
Noise Contours
65 dB+
Compatibility Change
Compatible, Increased Degree of Compatibility
Compatible, Decreased Degree of Compatibility
Compatible, Previously Incompatible
Incompatible, Previously Compatible
Other Features
Major Roads
Other Arterials
Major Lakes
JOINING FORCES
0 0.5 1 Miles
N
May 18, 2017

Table 4

AIR INSTALLATION COMPATIBLE USE ZONES
SUGGESTED LAND USE COMPATIBILITY IN ACCIDENT POTENTIAL ZONES[1]

SLUCM NO.	LAND USE NAME	CLEAR ZONE Recommendation	APZ-I Recommendation	APZ-II Recommendation	Density Recommendation
10	***RESIDENTIAL***				
11	Household Units				
11.11	Single units: detached	N	N	Y[2]	Max density of 1-2 Du/Ac
11.12	Single units: semidetached	N	N	N	
11.13	Single units: attached row	N	N	N	
11.21	Two units: side-by-side	N	N	N	
11.22	Two units: one above the other	N	N	N	
11.31	Apartments: walk-up	N	N	N	
11.32	Apartment: elevator	N	N	N	
12	Group quarters	N	N	N	
13	Residential Hotels	N	N	N	
14	Mobile home parks or courts	N	N	N	
15	Transient lodgings	N	N	N	
16	Other residential	N	N	N	
20	***MANUFACTURING[3]***				
21	Food & kindred products; manufacturing	N	N	Y[2]	Max FAR 0.56 in APZ II
22	Textile mill products; manufacturing	N	N	Y[2]	same as above
23	Apparel and other finished products; products made from fabrics, leather and similar materials	N	N	N	
24	Lumber and wood products (except furniture); manufacturing	N	Y	Y[2]	Max FAR of 0.28 in APZ I & 0.56 in APZ II
25	Furniture and fixtures; manufacturing	N	Y	Y[2]	same as above
26	Paper and allied products; manufacturing	N	Y	Y[2]	same as above
27	Printing, publishing, and allied industries	N	Y	Y[2]	same as above
28	Chemicals and allied products; manufacturing	N	N	N	
29	Petroleum refining and related industries	N	N	N	
30	***MANUFACTURING[3] (continued)***				

AIR INSTALLATION COMPATIBLE USE ZONES SUGGESTED LAND USE COMPATIBILITY IN ACCIDENT POTENTIAL ZONES[1]					
SLUCM NO.	LAND USE NAME	CLEAR ZONE Recommendation	APZ-I Recommendation	APZ-II Recommendation	Density Recommendation
31	Rubber and misc. plastic products; manufacturing	N	N	N	
32	Stone, clay and glass products; manufacturing	N	N	Y	Max FAR 0.56 in APZ II
33	Primary metal products; manufacturing	N	N	Y	Same as above
34	Fabricated metal products; manufacturing	N	N	Y	Same as above
35	Professional scientific & controlling instrument; photographic and optical goods; watches and clocks	N	N	N	
39	Miscellaneous manufacturing	N	Y	Y	Max FAR of 0.28 in APZ I & 0.56 in APZ II
40	***Transportation, communication and utilities*** [4,5]				
41	Railroad, rapid rail transit, and street railway transportation	N	Y[5]	Y	Same as above
42	Motor vehicle transportation	N	Y[5]	Y	Same as above
43	Aircraft transportation	N	Y[5]	Y	Same as above
44	Marine craft transportation	N	Y[5]	Y	Same as above
45	Highway and street right-of-way	N	Y[5]	Y	Same as above
46	Auto parking	N	Y[5]	Y	Same as above
47	Communication	N	Y[5]	Y	Same as above
48	Utilities	N	Y[5]	Y	Same as above
48.5	Solid waste disposal (Landfills, incineration, etc.)	N	N	N	
49	Other transport, comm. and utilities	N	Y[5]	Y	See Note 6 below
50	***Trade***				
51	Wholesale trade	N	Y	Y	Max FAR of 0.28 in APZ I & 0.56 in APZ II
52	Retail trade - building materials, hardware and farm equipment	N	Y	Y	See Note 6 below
53	Retail trade - Shopping centers, Home Improvement Store, Discount Club, Electronics Superstore	N	N	Y	Max FAR of 0.16 in APZ II
54	Retail trade - food	N	N	Y	Max FAR of 0.24 in APZ II

AIR INSTALLATION COMPATIBLE USE ZONES SUGGESTED LAND USE COMPATIBILITY IN ACCIDENT POTENTIAL ZONES[1]					
SLUCM NO.	LAND USE NAME	CLEAR ZONE Recommendation	APZ-I Recommendation	APZ-II Recommendation	Density Recommendation
55	Retail trade - automotive, marine craft, aircraft and accessories	N	Y	Y	Max FAR of 0.14 in APZ I & 0.28 in APZ II
56	Retail trade - apparel and accessories	N	N	Y	Max FAR 0.28 in APZ II
57	Retail trade - furniture, home, furnishings and equipment	N	N	Y	Same as above
58	Retail trade - eating and drinking establishments	N	N	N	
59	Other retail trade	N	N	Y	Max FAR of 0.16 in APZ II
60	***Services***				
61	Finance, insurance and real estate services	N	N	Y	Max FAR of 0.22 for "General Office/Office park" in APZ II
62	Personal services	N	N	Y	Office uses only. Max FAR of 0.22 in APZ II
62.4	Cemeteries	N	Y[9]	Y[9]	
63	Business services(credit reporting; mail, stenographic, reproduction; advertising)	N	N	Y	Max FAR of 0.22 in APZ II
63.7	Warehousing and storage services	N	Y[9]	Y	Max FAR 1.0 APZ I; 2.0 in APZ II
64	Repair services	N	Y	Y	Max FAR of 0.11 APZ I; 0.22 in APZ II
65	Professional services	N	N	Y	Max FAR of 0.22 in APZ II
65.1	Hospitals, nursing homes	N	N	N	
65.1	Other medical facilities	N	N	N	
66	Contract construction services	N	Y	Y	Max FAR of 0.11 APZ I; 0.22 in APZ II
67	Government Services	N	N	Y	Max FAR of 0.24 in APZ II
68	Educational services	N	N	N	
69	Miscellaneous	N	N	Y	Max FAR of 0.22 in APZ II
70	***Cultural, entertainment and recreational***				
71	Cultural activities	N	N	N	
71.2	Nature exhibits	N	Y[10]	Y[10]	
72	Public assembly	N	N	N	
72.1	Auditoriums, concert halls	N	N	N	
72.11	Outdoor music shells, amphitheaters	N	N	N	

AIR INSTALLATION COMPATIBLE USE ZONES SUGGESTED LAND USE COMPATIBILITY IN ACCIDENT POTENTIAL ZONES[1]					
SLUCM NO.	LAND USE NAME	CLEAR ZONE Recommendation	APZ-I Recommendation	APZ-II Recommendation	Density Recommendation
72.2	Outdoor sports arenas, spectator sports	N	N	N	
73	Amusements - fairgrounds, miniature golf, driving ranges, amusement parks, etc.	N	N	Y	
74	Recreational activities (including golf courses, riding stables, water recreation)	N	Y[10]	Y[10]	Max FAR of 0.11 APZ I; 0.22 in APZ II
75	Resorts and group camps	N	N	N	
76	Parks	N	Y[10]	Y[10]	Same as 74
79	Other cultural, entertainment and recreation	N	Y[9]	Y[9]	Same as 74
80	***Resource Production and Extraction***				
81	Agriculture (except live stock)	Y[4]	Y[11]	Y[11]	
81.5, 81.7	Livestock farming and breeding	N	Y[11,12]	Y[11,12]	
82	Agriculture related activities	N	Y[11]	Y[11]	Max FAR of 0.28 APZ I; 0.56 APZ II no activity which produces smoke, glare, or involves explosives
83	Forestry Activities[13]	N	Y	Y	Same as above
84	Fishing Activities[14]	N[14]	Y	Y	Same as above
85	Mining Activities	N	Y	Y	Same as above
89	Other resource production or extraction	N	Y	Y	Same as above
90	***Other***				
91	Undeveloped Land	Y[4]	Y	Y	
93	Water Areas	N[15]	N[15]	N[15]	

OPNAVINST 11010.36C
MCO 11010.16
9 Oct 2008

KEY - SUGGESTED LAND USE COMPATIBILITY IN ACCIDENT POTENTIAL ZONES

SLUCM -	Standard Land use Coding Manual, U.S. Department of Transportation
Y (Yes) -	Land use and related structures are normally compatible without restriction.
N (No) -	Land use and related structures are not normally compatible and should be prohibited.
Yx - (Yes with restrictions)	The land use and related structures are generally compatible. However, see notes indicated by the superscript.
Nx - (No with exceptions)	The land use and related structures are generallyincompatible. However, see notes indicated by the superscript.
FAR - Floor Area Ratio	A floor area ratio is the ratio between the square feet of floor area of the building and the site area.It is customarily used to measure non-residential intensities.
Du/Ac - Dwelling Units per Acre	This metric is customarily used to measure residential densities.

OPNAVINST 11010.36C
MCO 11010.16
9 Oct 2008

NOTES - SUGGESTED LAND USE COMPATIBILITY IN ACCIDENT POTENTIAL ZONES

The following notes refer to Table 2.

1. A "Yes" or a "No" 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 densities of people and structures. In order to assist installations and local governments, general suggestions as to FARs are provided as a guide to density in some categories. In general, land use restrictions which limit commercial, services, or industrial buildings or structure occupants to 25 per acre in APZ I, and 50 per acre in APZ II are the range of occupancy levels, including employees, considered to be low density. Outside events should normally be limited to assemblies of not more than 25 people per acre in APZ I, and Maximum (Max) assemblies of 50 people per acre in APZ II.

2. The suggested Max density for detached single-family housing is one to two Du/Ac. 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 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), buildings or aboveground utility/communications lines should normally be located in clear zone areas on or off the installation. The clear zone is subject to severe restrictions. See UFC 3-260-01, "Airfield and Heliport Planning and Design" dated 10 November 2001 for specific design details.

5. No passenger terminals and no major above ground transmission lines in APZ I.

6. Within SLUCM Code 52, Max FARs for lumber Yards (SLUCM Code 521) are 0.20 in APZ-I and 0.40 in APZ-II. For hardware/paint and farm equipment stores, SLUCM Code 525, the Max FARs are 0.12 in APZ-I and 0.24 in APZ-II.

7. 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, supermarket or drug store, discount retailer, department store, or several department stores, respectively. Included in this category are such uses as big box discount clubs, home improvement superstores, office supply superstores, and electronics superstores. The Max recommended FAR for SLUCM 53 should be applied to the gross leasable area of the shopping center rather than attempting to use other recommended FARs listed in Table 2 under "Retail" or "Trade."

8. Low intensity office uses only. Accessory uses such as meeting places, auditoriums, etc., are not recommended.

9. No chapels are allowed within APZ I or APZ II.

10. Facilities must be low intensity, and provide no tot lots, etc. Facilities such as clubhouses, meeting places, auditoriums, large classes, etc. are not recommended.

11. Includes livestock grazing, but excludes feedlots and intensive animal husbandry. Activities that attract concentrations of birds creating a hazard to aircraft operations should be excluded.

12. Includes feedlots and intensive animal husbandry.

13. Lumber and timber products removed due to establishment, expansion, or maintenance of clear zones will be disposed of in accordance with appropriate DoD Natural Resources instructions.

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

15. Naturally occurring water features (e.g., rivers, lakes, streams, (wetlands) are compatible.

Figure 11

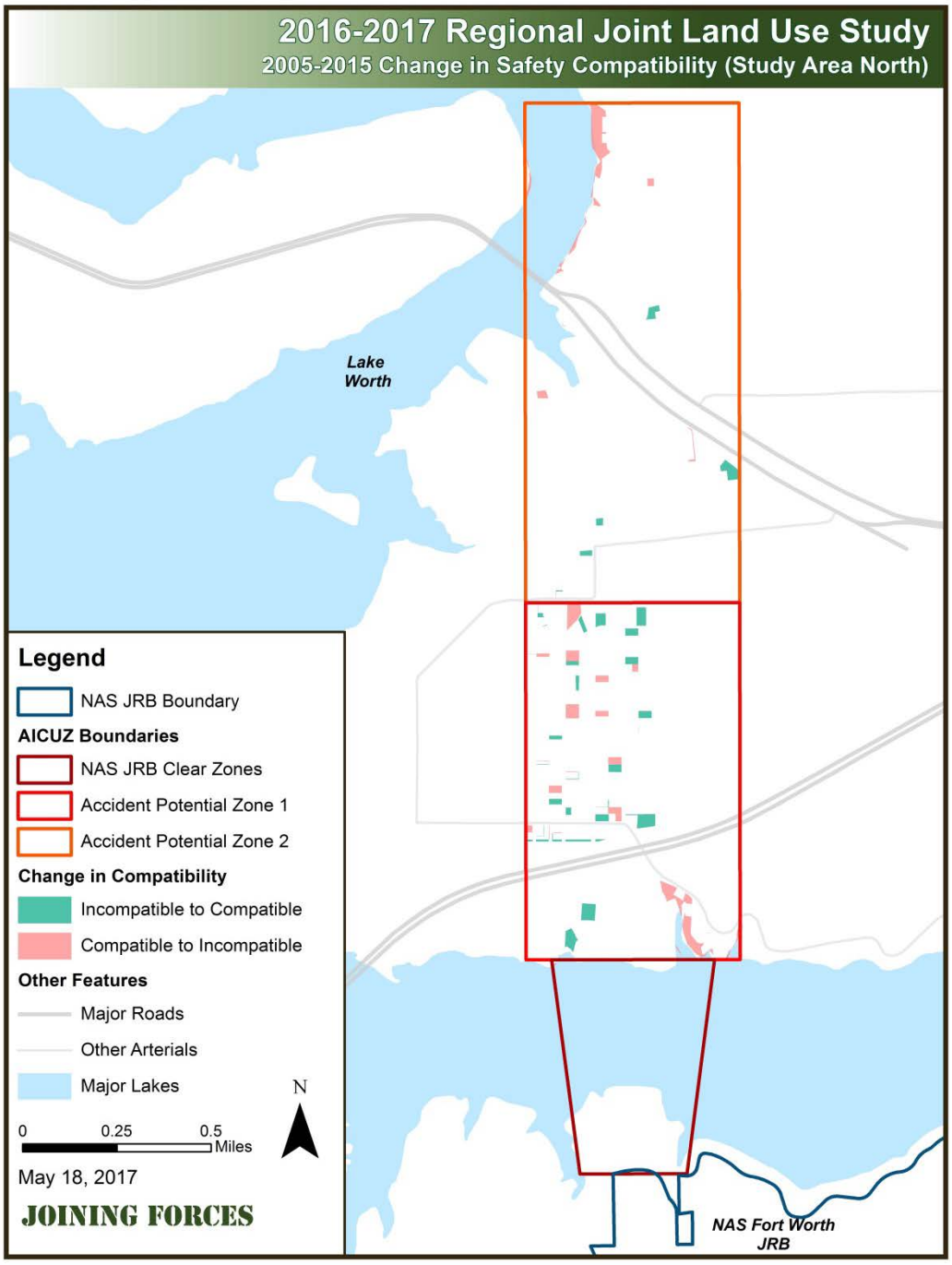
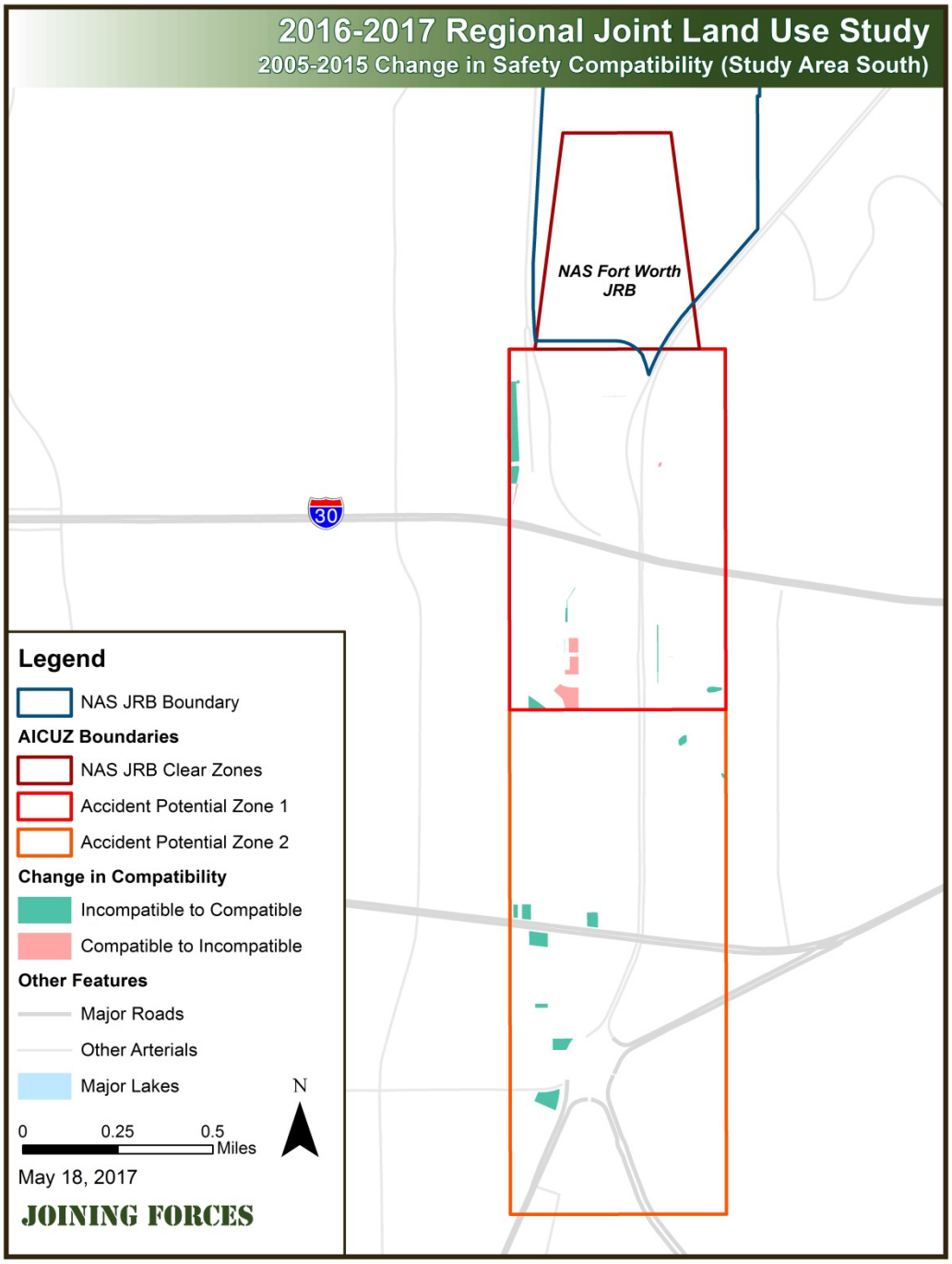

2016-2017 Regional Joint Land Use Study
2005-2015 Change in Safety Compatibility (Study Area North)
Lake Worth
Legend
NAS JRB Boundary
AICUZ Boundaries
NAS JRB Clear Zones
Accident Potential Zone 1
Accident Potential Zone 2
Change in Compatibility
Incompatible to Compatible
Compatible to Incompatible
Other Features
Major Roads
Other Arterials
Major Lakes
N
0
0.25
0.5
Miles
May 18, 2017
JOINING FORCES
NAS Fort Worth JRB

Figure 12


2016-2017 Regional Joint Land Use Study
2005-2015 Change in Safety Compatibility (Study Area South)
NAS Fort Worth JRB
30
Legend
NAS JRB Boundary
AICUZ Boundaries
NAS JRB Clear Zones
Accident Potential Zone 1
Accident Potential Zone 2
Change in Compatibility
Incompatible to Compatible
Compatible to Incompatible
Other Features
Major Roads
Other Arterials
Major Lakes
N
0
0.25
0.5
Miles
May 18, 2017
JOINING FORCES

Zoning and Future Land Use Plans

City comprehensive plans provide information about municipalities' plans for growth. These plans typically include zoning and future land use plans. Mappable data associated with zoning and future land use plans is available from some, but not all, of the municipalities neighboring NAS Fort Worth, JRB. Tarrant County does not have zoning authority, and therefore does not develop zoning or future land use plans.

The dates of available zoning data that have been mapped for this land-use analysis are as follows:

- City of Benbrook: 2013
- City of Fort Worth: 2012 (predating ordinances creating overlays for the installation)
- City of White Settlement: 2013

A map displaying these cities' zoning is available as **Figure 13.** To improve the map's readability and address differences between cities in the zoning categories used, the cities' zoning categories have been aggregated to land uses similar to those used for RIS land use data. The City of Lake Worth provides a static Official Zoning Map from 2013 as seen in **Figure 14.**

The dates of available future land use plans data that have been mapped are as follows:

- City of Benbrook: 2013
- City of Fort Worth: 2014
- City of River Oaks: date unknown
- City of White Settlement: date unknown

A map displaying these cities' future land use plans is available as **Figure 15**. As with the zoning maps, the cities' land use categories have been aggregated to approximate those used

for RIS land use data. The City of Westworth Village provides a static 2015 Land Use Map as seen in **Figure 16**.

Figure 13

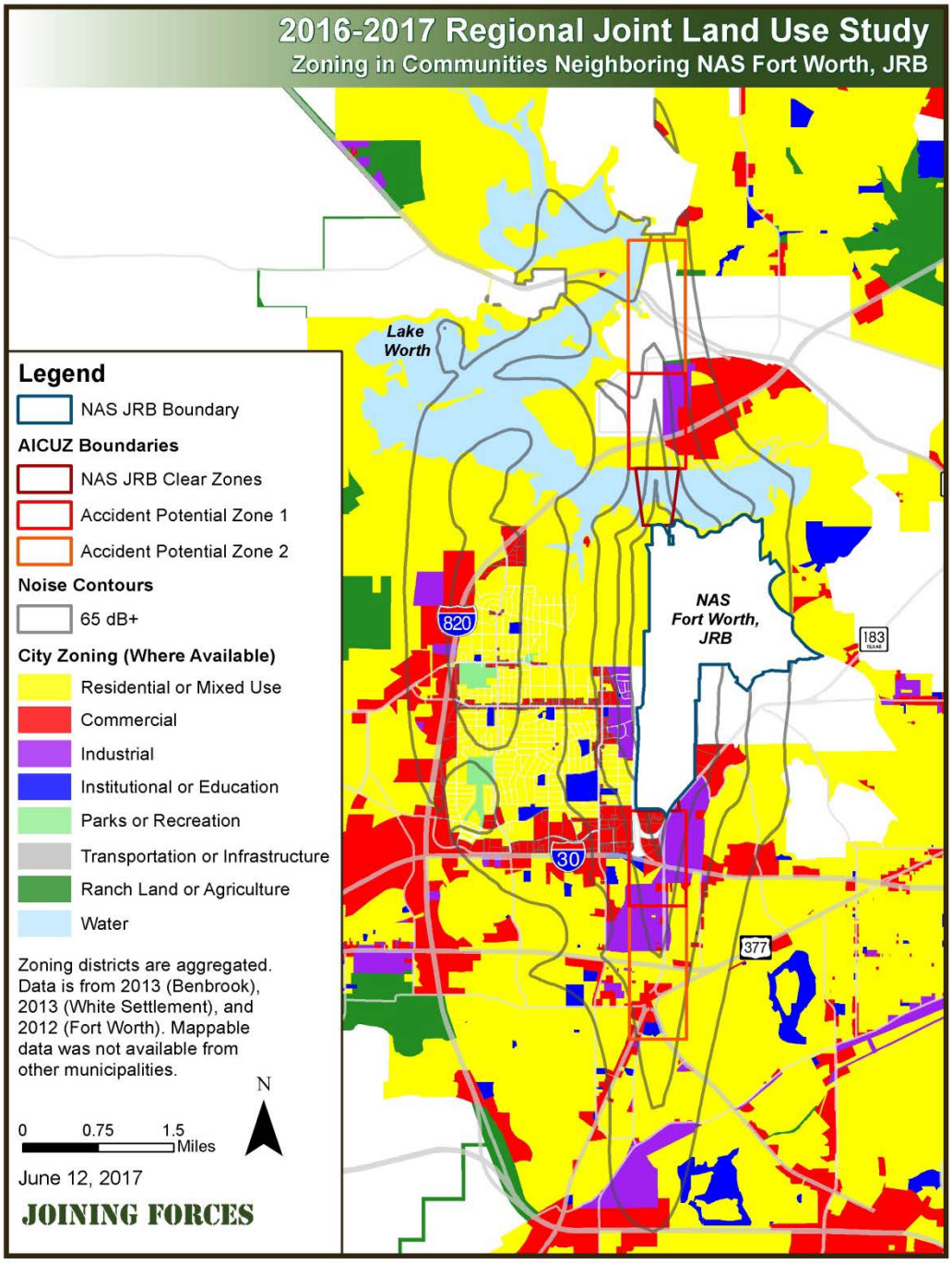

2016-2017 Regional Joint Land Use Study
Zoning in Communities Neighboring NAS Fort Worth, JRB
Lake Worth
NAS Fort Worth, JRB
820
30
377
183
Legend
NAS JRB Boundary
AICUZ Boundaries
NAS JRB Clear Zones
Accident Potential Zone 1
Accident Potential Zone 2
Noise Contours
65 dB+
City Zoning (Where Available)
Residential or Mixed Use
Commercial
Industrial
Institutional or Education
Parks or Recreation
Transportation or Infrastructure
Ranch Land or Agriculture
Water
Zoning districts are aggregated. Data is from 2013 (Benbrook), 2013 (White Settlement), and 2012 (Fort Worth). Mappable data was not available from other municipalities.
N
0 0.75 1.5 Miles
June 12, 2017
JOINING FORCES

Figure 14

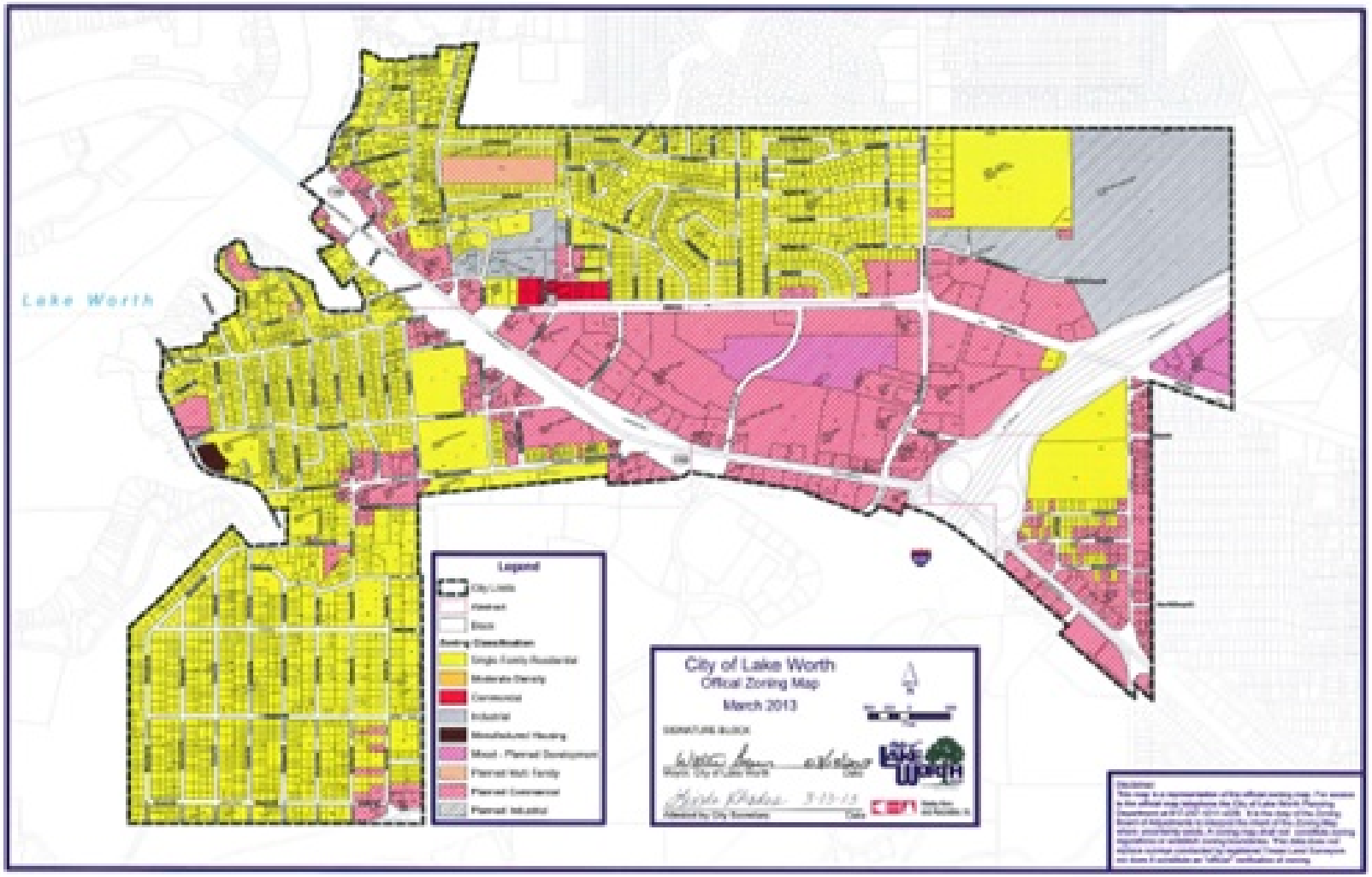

Lake Worth
Legend
City of Lake Worth
Official Zoning Map
March 2013

Figure 15

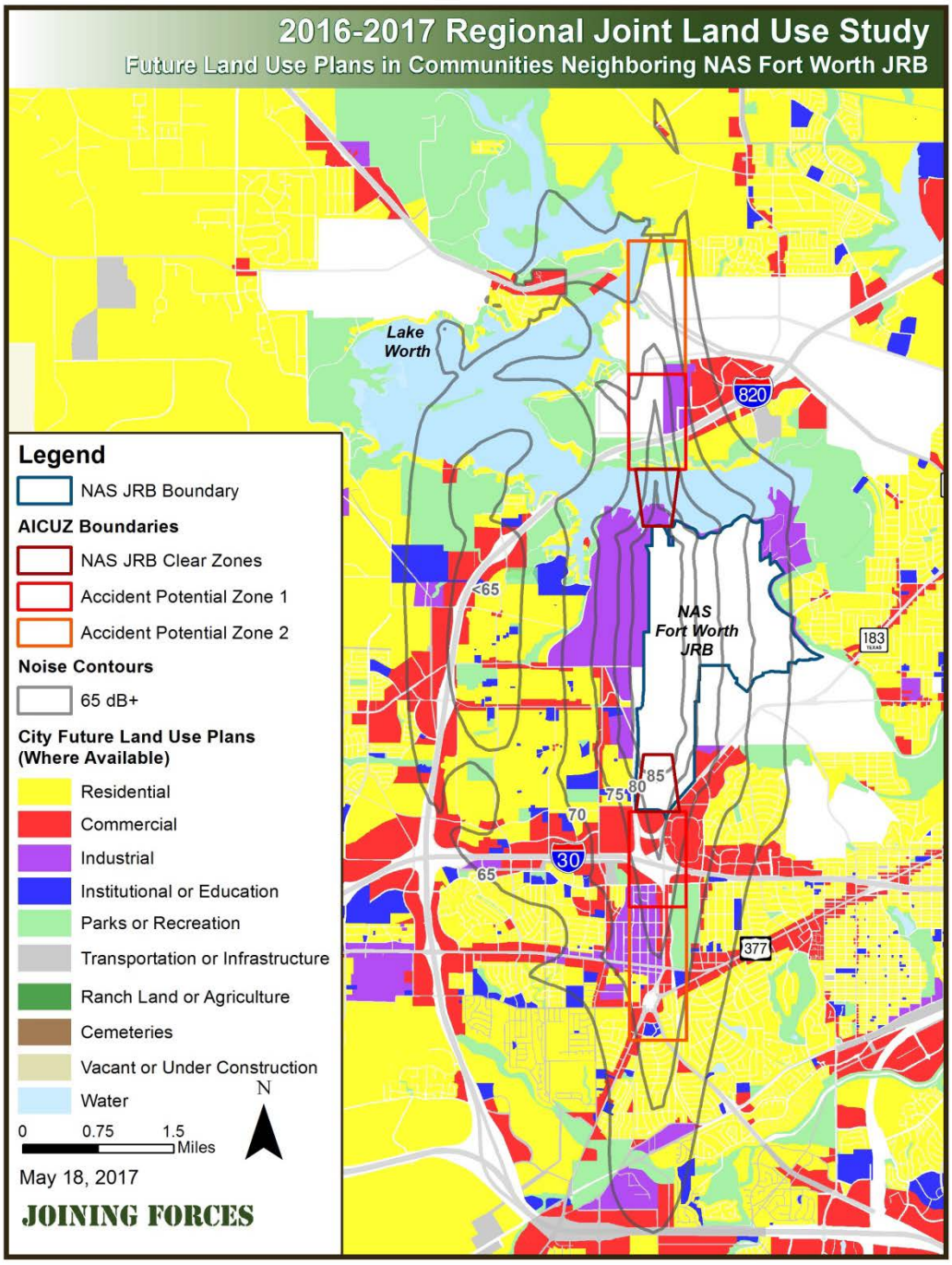
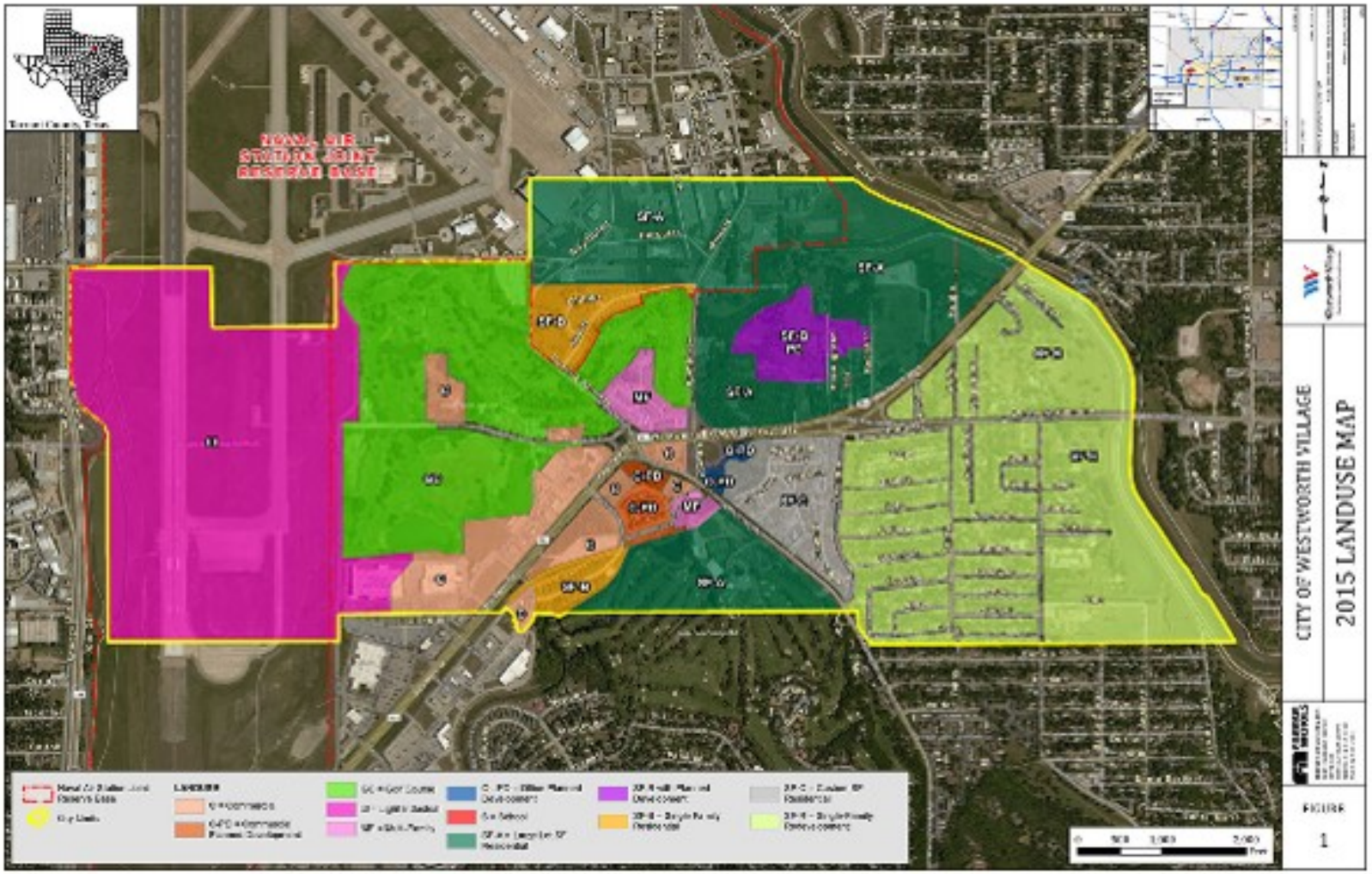

2016-2017 Regional Joint Land Use Study
Future Land Use Plans in Communities Neighboring NAS Fort Worth JRB
Lake Worth
NAS Fort Worth JRB
820
183
30
377
Legend
NAS JRB Boundary
AICUZ Boundaries
NAS JRB Clear Zones
Accident Potential Zone 1
Accident Potential Zone 2
Noise Contours
65 dB+
City Future Land Use Plans (Where Available)
Residential
Commercial
Industrial
Institutional or Education
Parks or Recreation
Transportation or Infrastructure
Ranch Land or Agriculture
Cemeteries
Vacant or Under Construction
Water
N
0 0.75 1.5 Miles
May 18, 2017
JOINING FORCES

Figure 16



Positive Economic Environment

Noise contours associated with military aircraft were developed in response to the Noise Control Act of 1972, which requires federal agencies such as the Department of Defense to develop measures to limit noise that could harm people's health or welfare. To meet these and other requirements, the Department of Defense's AICUZ program establishes noise contours based on day-night average A-weighted sound level and delineates safety zones showing an increasing potential for accidents. The AICUZ program also identifies land uses that are compatible, compatible if conditions such as sound attenuation or local need are met, or incompatible within these noise contours and safety zones.

Because development surrounding NAS Fort Worth, JRB predates this AICUZ program, some existing land uses are not compatible with the noise impacts of the installation's air operations. Despite this, communities surrounding the base continue to thrive and even benefit from their close proximity to the installation.

NAS Fort Worth, JRB itself is a valuable economic asset to neighboring communities and is the fourth-largest employer in the six counties that neighbor the Naval Air Station[6]. Lockheed Martin Aeronautics Company, which is co-located with the installation, is the second-largest employer in this area. The installation's estimated contributions to the Texas economy in 2015[7] include:

- Total employment: 47,256
- Output: $6,576,894,000

[6] Comprehensive Housing Market Analysis Fort Worth-Arlington, Texas, published by the U.S. Department of Housing and Urban Development Office of Policy Development and Research on June 1, 2016. https://www.huduser.gov/portal/publications/pdf/FortWorthTX-comp-16.pdf

[7] Fort Worth Joint Reserve Base Estimated Contribution to the Texas Economy, 2015 https://comptroller.texas.gov/economy/economic-data/text-only/nas-fortworth.php

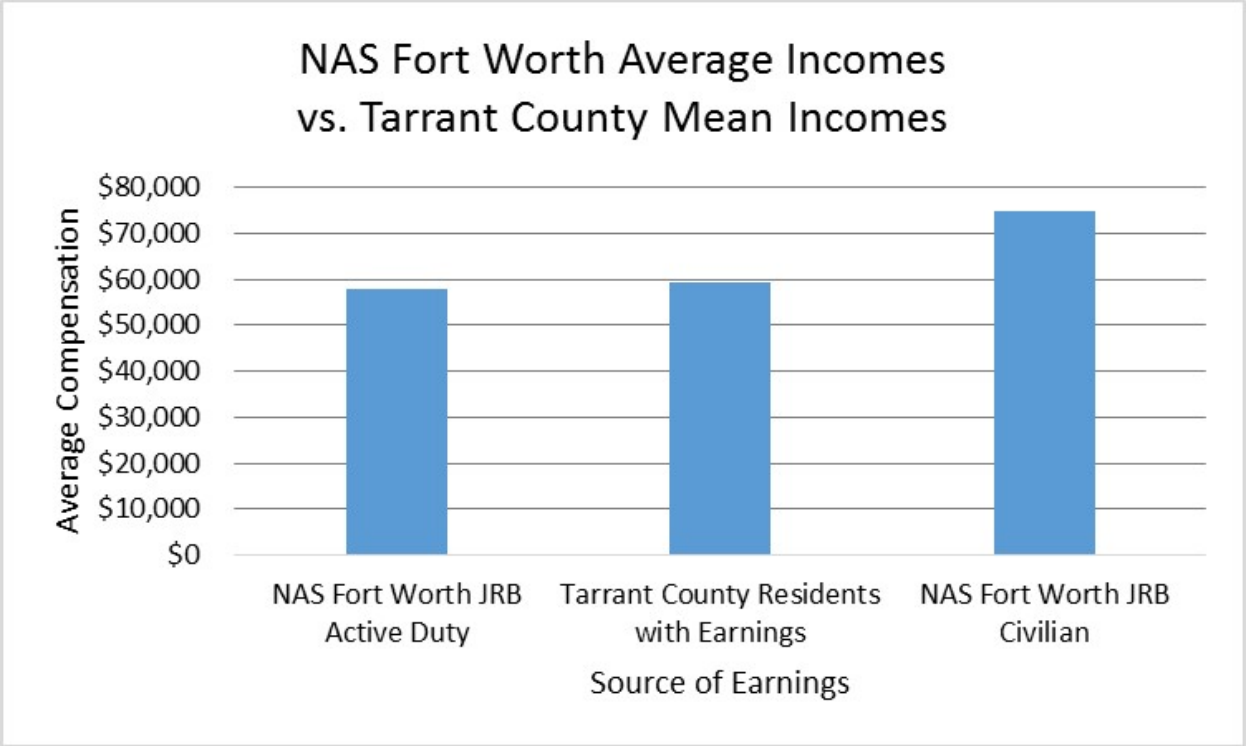
- Gross domestic product: $4,266,811,000
- Disposable personal income: $2,681,192,000

The average compensation[8] of full-time military and civilian employees at NAS Fort Worth JRB matches or surpasses, respectively, the mean earnings of Tarrant County residents age 16 years and over[9] (**Figure 17**).

[8] Ibid

[9] Data acquired from American Community Survey 5-Year Estimates, Table S2001 Earnings in the Past 12 Months (in 2015 Inflation-Adjusted Dollars)

Figure 17



Property values in many of the communities neighboring the installation and across Tarrant County have increased in the years since the 2008 JLUS. The Tarrant Appraisal District administers the appraisal of properties in Tarrant County; the district supplied the data used to document the property value growth seen in **Figure 18** and **Figure 19**. Some areas near the installation have experienced property value growth greater than 50 percent from 2009 to 2016. **Table 5** documents the growth in the average market values during those years for properties in jurisdictions that neighbor the installation.

Economic growth has also been seen in the wholesale and retail trade sector. In the Fort Worth-Arlington Housing Market Area[10] (HMA), this sector added 6,100 jobs from June 2015 to May 2016. The 2015 increase in gross retail sales for the HMA was almost three times as great as the 2014 increase[11]. Some communities directly neighboring NAS Fort Worth, JRB also are experiencing growth in this sector, with sales growing faster than inflation according to data from the Texas Comptroller of Public Accounts (**Figure 20**). Some Census block groups near the installation have experienced sales growth greater than 400 percent above inflation. Note that because of the size and boundaries of Census block groups, some economic activity may be occurring outside the installation's noise contours but be shown on Figure 20 as occurring outside and within the noise contours.

Employment can also be an indicator of a positive economic environment. In economic base theory, core economic activity – usually manufacturing – is considered basic employment activity. Non-basic employment activity, usually service employment, follows as a result of the basic industrial activity. This methodology was chosen for this land-use analysis because of the presence of military aircraft manufacturing at Lockheed Martin and other businesses, and because of the relatively recent development of retail establishments near NAS Fort Worth, JRB.

The distribution of employment can be visualized using data from the North American Industry Classification System (NAICS). This system classifies business establishments into categories to enable analyses of the business economy. Using the NAICS classification data for professional

[10] Includes Tarrant, Parker, Wise, Johnson, Hood, and Somervell counties

[11] Comprehensive Housing Market Analysis Fort Worth-Arlington, Texas, published by the U.S. Department of Housing and Urban Development Office of Policy Development and Research on June 1, 2016. https://www.huduser.gov/portal/publications/pdf/FortWorthTX-comp-16.pdf

and scientific, manufacturing, public administration, and retail sectors, it is possible to determine spatial patterns and concentrations of basic and non-basic economic employment.

The NAICS data are included within a broad workplace and residence characteristic dataset available from the U.S. Census Bureau. The total number of jobs, and other attributes by NAICS code, are included in the dataset.

The data is represented in a series of maps, four of which show distribution and concentration by block group (**Figures 21-24**), and one of which used the manufacturing data to create an interpolated surface map (**Figure 25**). Interpolation takes a series of data and averages the values, assuming that those points closer together have similar characteristics. Data points farther away from the center point are less similar, and therefore have less influence.

Figure 18

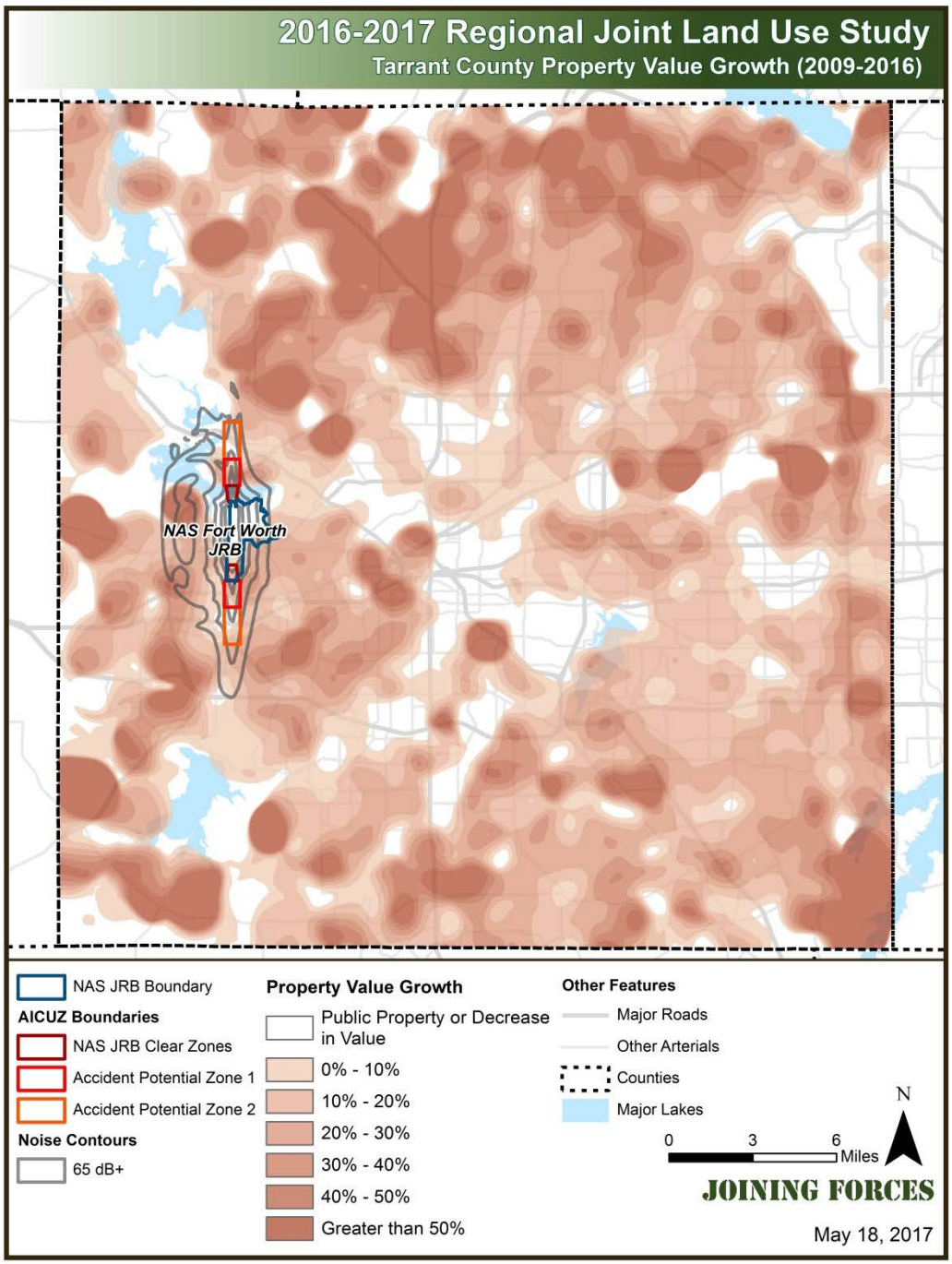

2016-2017 Regional Joint Land Use Study
Tarrant County Property Value Growth (2009-2016)
NAS Fort Worth JRB
NAS JRB Boundary
AICUZ Boundaries
NAS JRB Clear Zones
Accident Potential Zone 1
Accident Potential Zone 2
Noise Contours
65 dB+
Property Value Growth
Public Property or Decrease in Value
0% - 10%
10% - 20%
20% - 30%
30% - 40%
40% - 50%
Greater than 50%
Other Features
Major Roads
Other Arterials
Counties
Major Lakes
N
0
3
6
Miles
JOINING FORCES
May 18, 2017

Figure 19

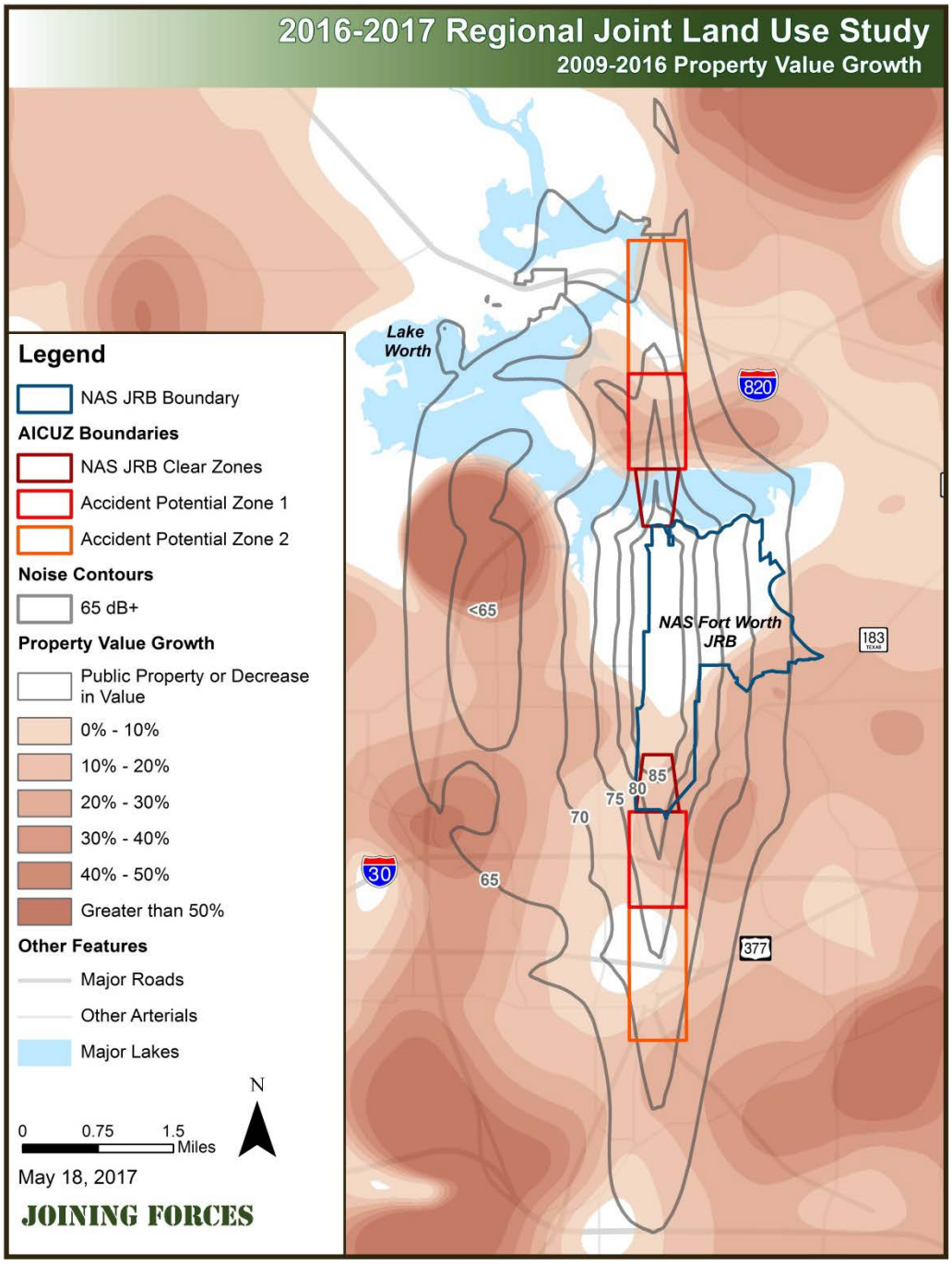

2016-2017 Regional Joint Land Use Study
2009-2016 Property Value Growth
Legend
NAS JRB Boundary
AICUZ Boundaries
NAS JRB Clear Zones
Accident Potential Zone 1
Accident Potential Zone 2
Noise Contours
65 dB+
Property Value Growth
Public Property or Decrease in Value
0% - 10%
10% - 20%
20% - 30%
30% - 40%
40% - 50%
Greater than 50%
Other Features
Major Roads
Other Arterials
Major Lakes
N
0
0.75
1.5
Miles
May 18, 2017
JOINING FORCES
Lake Worth
820
<65
NAS Fort Worth JRB
183
85
80
75
70
65
30
377

Table 5

Jurisdiction	2009 Average Market Value	2016 Average Market Value
City of Benbrook	$146,009	$175,388
City of Fort Worth	$121, 997	$159,311
City of Lake Worth	$79,501	100,883
City of River Oaks	$76,529	$90,076
City of Sansom Park	$61,080	$65,226
City of Westworth Village	$142,873	$221,375
City of White Settlement	$71,166	$90,740
Tarrant County	$151,960	$191,242

Data is from Tarrant Appraisal District Average Residential Value reports from September 9, 2016 and September 1, 2009.

Figure 20

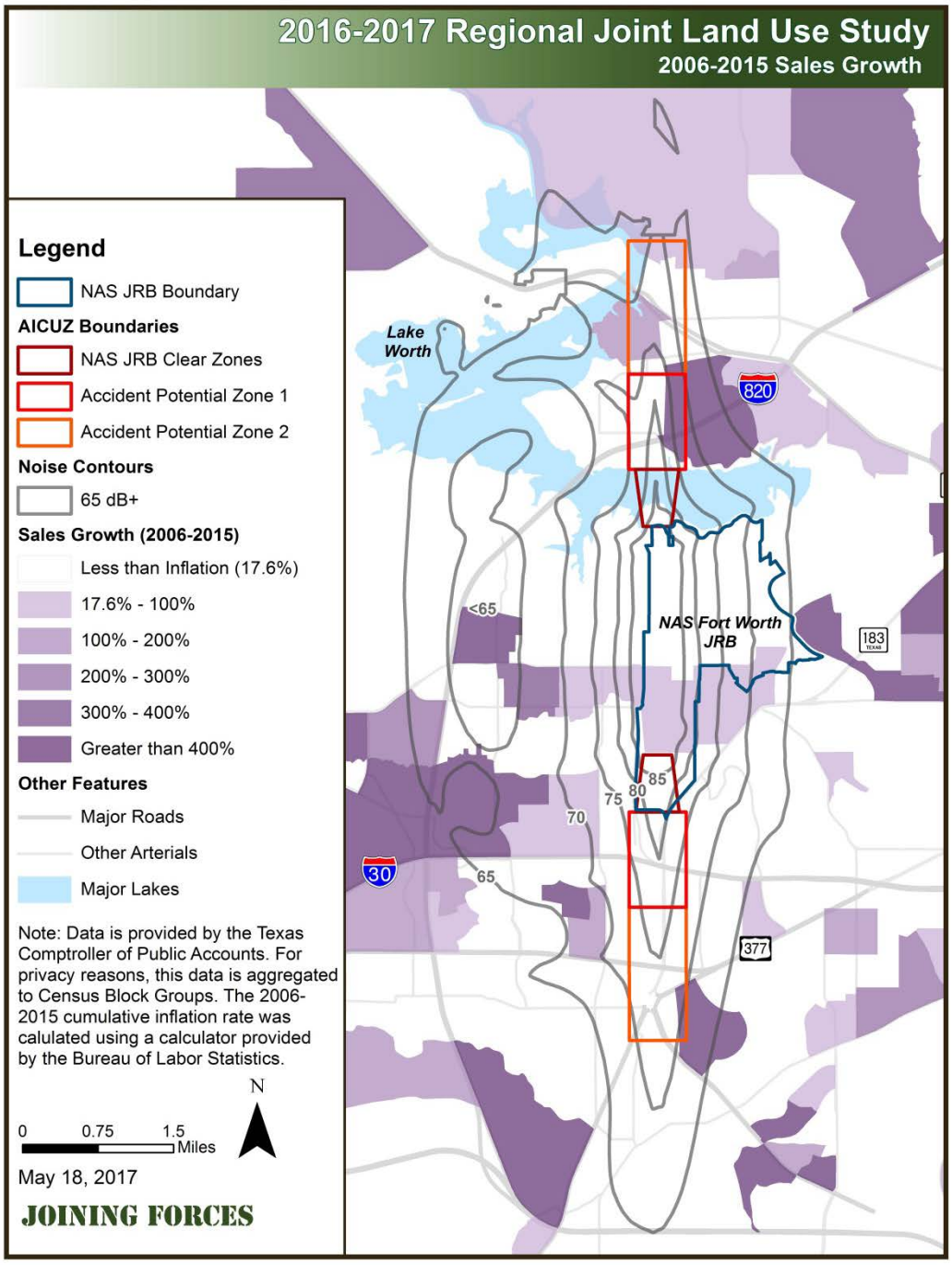

2016-2017 Regional Joint Land Use Study
2006-2015 Sales Growth
Legend
NAS JRB Boundary
AICUZ Boundaries
NAS JRB Clear Zones
Accident Potential Zone 1
Accident Potential Zone 2
Noise Contours
65 dB+
Sales Growth (2006-2015)
Less than Inflation (17.6%)
17.6% - 100%
100% - 200%
200% - 300%
300% - 400%
Greater than 400%
Other Features
Major Roads
Other Arterials
Major Lakes
Note: Data is provided by the Texas Comptroller of Public Accounts. For privacy reasons, this data is aggregated to Census Block Groups. The 2006-2015 cumulative inflation rate was calulated using a calculator provided by the Bureau of Labor Statistics.
N
0 0.75 1.5 Miles
May 18, 2017
JOINING FORCES
Lake Worth
NAS Fort Worth JRB
820
183
30
377
<65
65
70
75
80
85

Figure 21

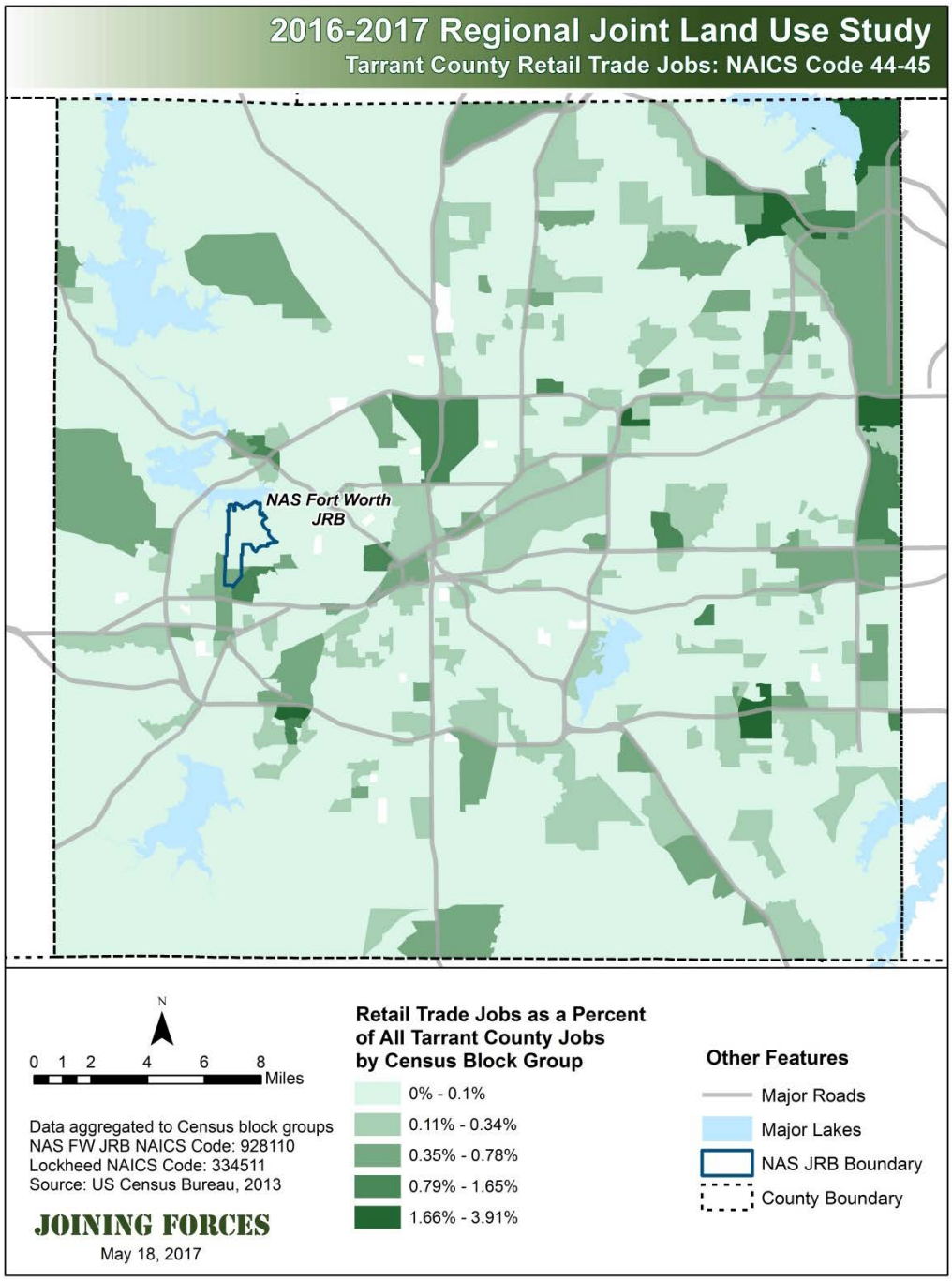

2016-2017 Regional Joint Land Use Study
Tarrant County Retail Trade Jobs: NAICS Code 44-45
NAS Fort Worth JRB
N
0 1 2 4 6 8
Miles
Data aggregated to Census block groups
NAS FW JRB NAICS Code: 928110
Lockheed NAICS Code: 334511
Source: US Census Bureau, 2013
JOINING FORCES
May 18, 2017
Retail Trade Jobs as a Percent of All Tarrant County Jobs by Census Block Group
0% - 0.1%
0.11% - 0.34%
0.35% - 0.78%
0.79% - 1.65%
1.66% - 3.91%
Other Features
Major Roads
Major Lakes
NAS JRB Boundary
County Boundary

Figure 22

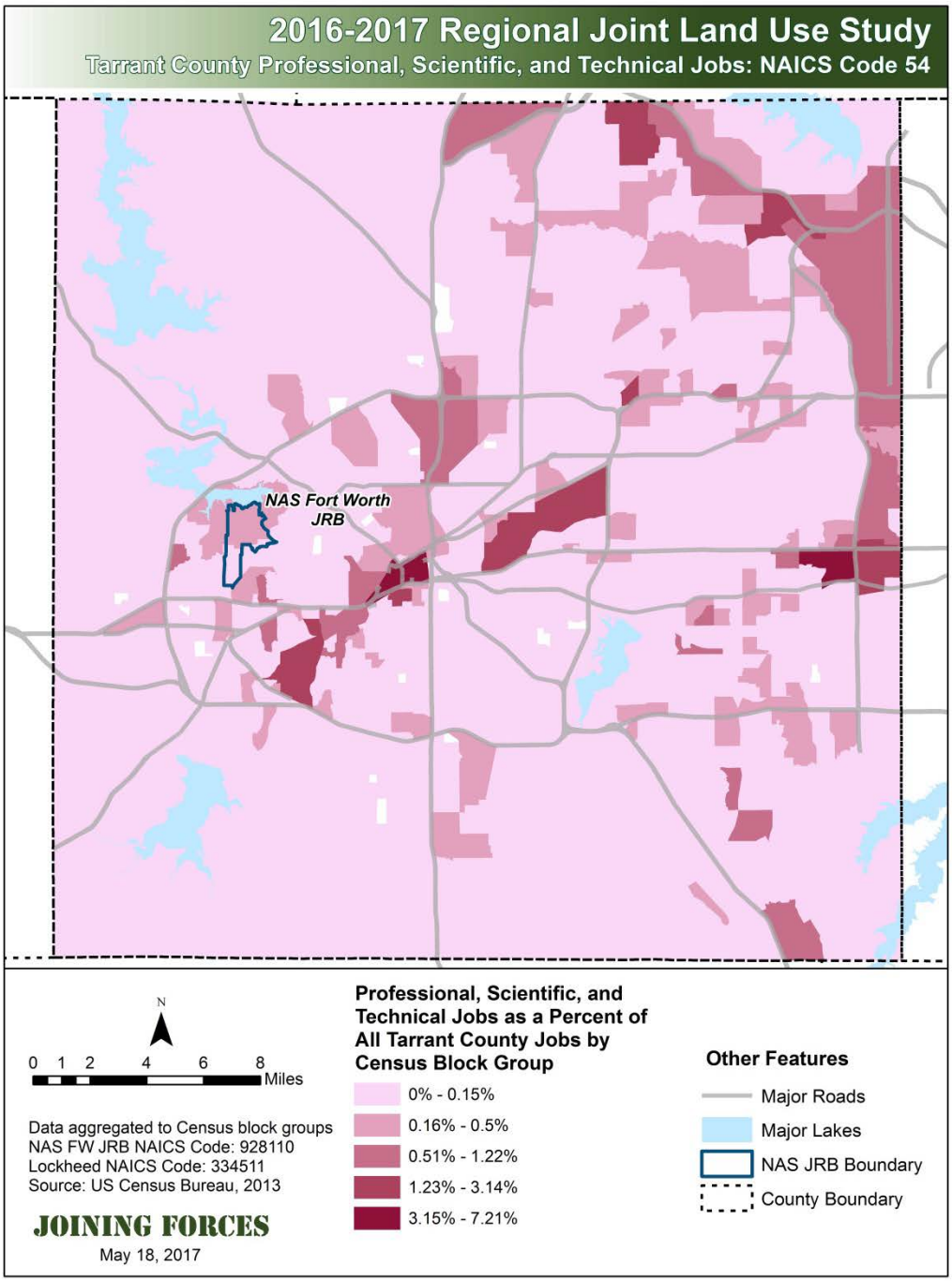

2016-2017 Regional Joint Land Use Study
Tarrant County Professional, Scientific, and Technical Jobs: NAICS Code 54
NAS Fort Worth JRB
N
0 1 2 4 6 8
Miles
Data aggregated to Census block groups
NAS FW JRB NAICS Code: 928110
Lockheed NAICS Code: 334511
Source: US Census Bureau, 2013
JOINING FORCES
May 18, 2017
Professional, Scientific, and Technical Jobs as a Percent of All Tarrant County Jobs by Census Block Group
0% - 0.15%
0.16% - 0.5%
0.51% - 1.22%
1.23% - 3.14%
3.15% - 7.21%
Other Features
Major Roads
Major Lakes
NAS JRB Boundary
County Boundary

Figure 23

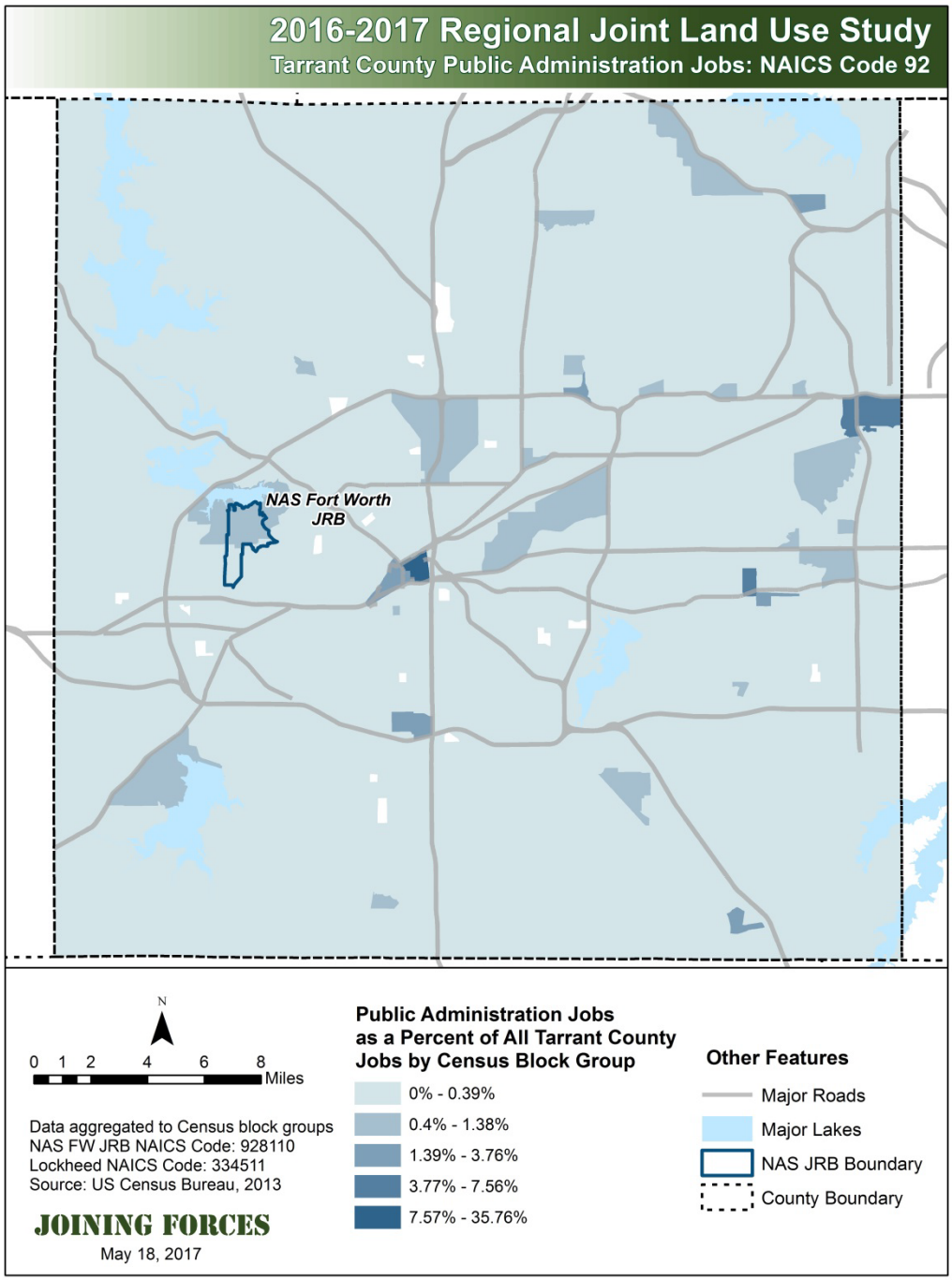

2016-2017 Regional Joint Land Use Study
Tarrant County Public Administration Jobs: NAICS Code 92
NAS Fort Worth JRB
N
0 1 2 4 6 8
Miles
Data aggregated to Census block groups
NAS FW JRB NAICS Code: 928110
Lockheed NAICS Code: 334511
Source: US Census Bureau, 2013
JOINING FORCES
May 18, 2017
Public Administration Jobs as a Percent of All Tarrant County Jobs by Census Block Group
0% - 0.39%
0.4% - 1.38%
1.39% - 3.76%
3.77% - 7.56%
7.57% - 35.76%
Other Features
Major Roads
Major Lakes
NAS JRB Boundary
County Boundary

Figure 24

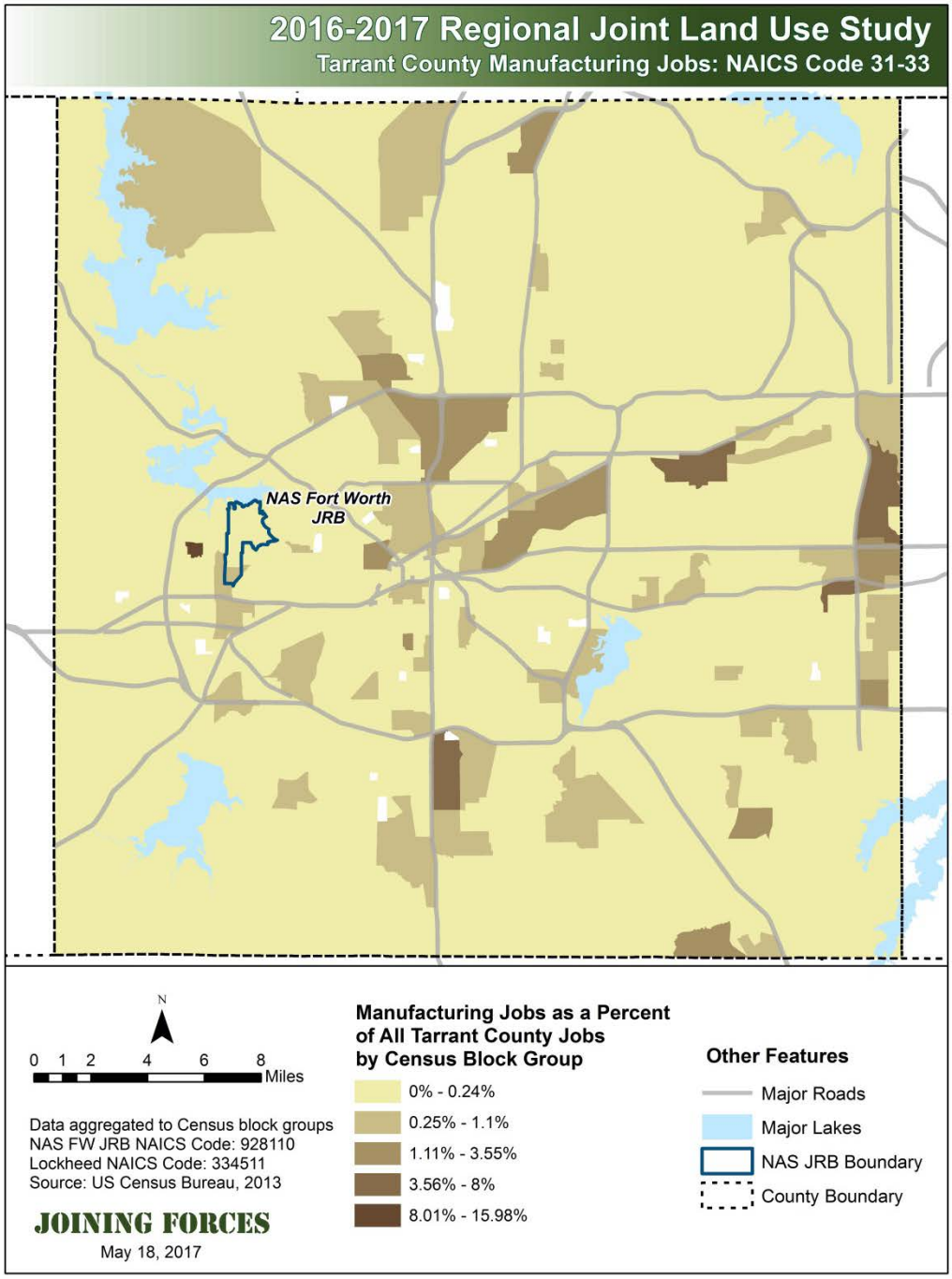
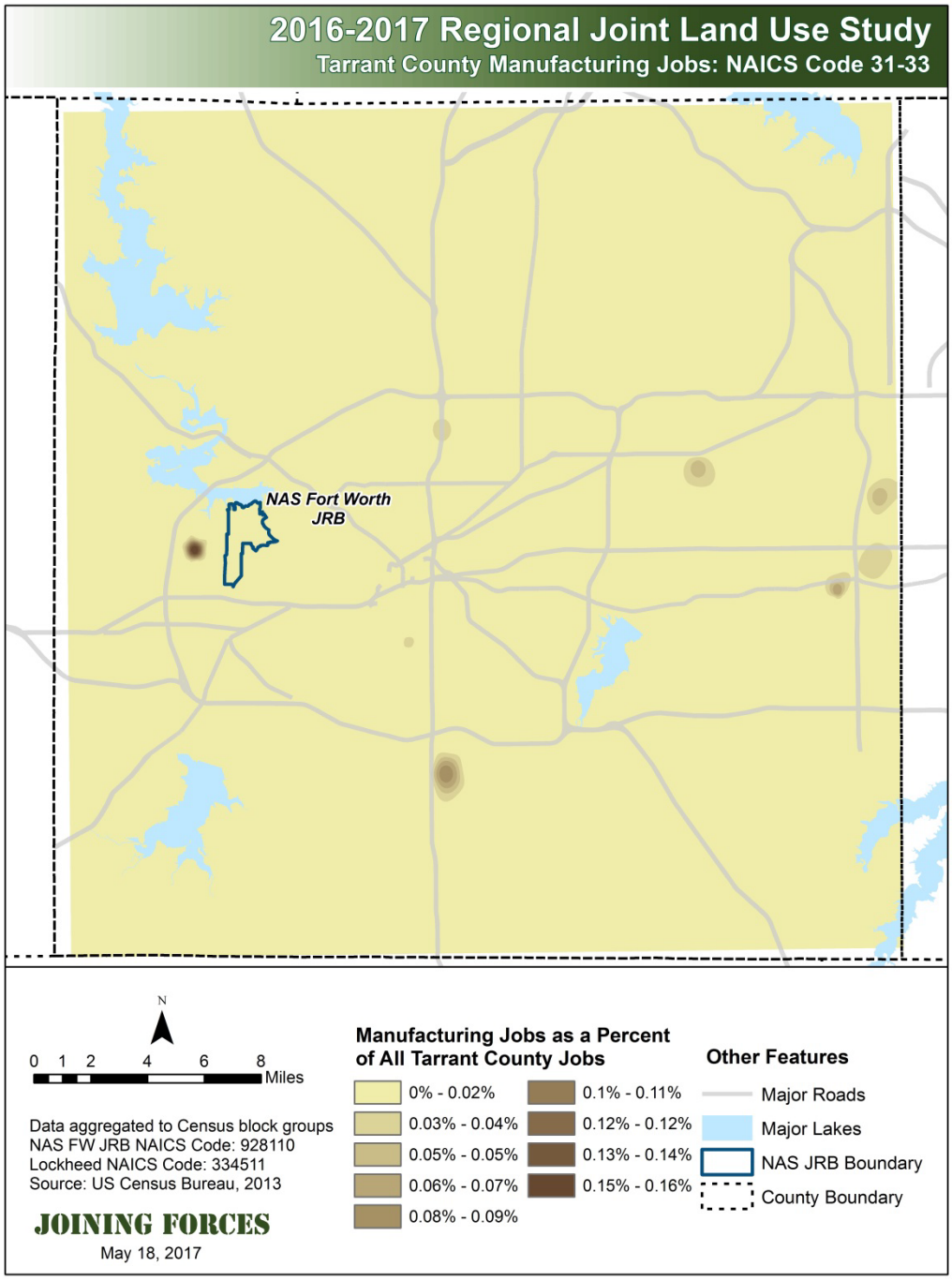

2016-2017 Regional Joint Land Use Study
Tarrant County Manufacturing Jobs: NAICS Code 31-33
NAS Fort Worth JRB
N
0 1 2 4 6 8
Miles
Data aggregated to Census block groups
NAS FW JRB NAICS Code: 928110
Lockheed NAICS Code: 334511
Source: US Census Bureau, 2013
JOINING FORCES
May 18, 2017
Manufacturing Jobs as a Percent of All Tarrant County Jobs by Census Block Group
0% - 0.24%
0.25% - 1.1%
1.11% - 3.55%
3.56% - 8%
8.01% - 15.98%
Other Features
Major Roads
Major Lakes
NAS JRB Boundary
County Boundary

Figure 25


2016-2017 Regional Joint Land Use Study
Tarrant County Manufacturing Jobs: NAICS Code 31-33
NAS Fort Worth JRB
N
0 1 2 4 6 8
Miles
Data aggregated to Census block groups
NAS FW JRB NAICS Code: 928110
Lockheed NAICS Code: 334511
Source: US Census Bureau, 2013
JOINING FORCES
May 18, 2017
Manufacturing Jobs as a Percent of All Tarrant County Jobs
0% - 0.02%
0.03% - 0.04%
0.05% - 0.05%
0.06% - 0.07%
0.08% - 0.09%
0.1% - 0.11%
0.12% - 0.12%
0.13% - 0.14%
0.15% - 0.16%
Other Features
Major Roads
Major Lakes
NAS JRB Boundary
County Boundary

Land Use Surrounding Additional JLUS Facilities

While the detailed land-use and economic analyses were constrained to NAS Fort Worth, JRB, land-use maps were created for additional facilities included in the JLUS. RIS land-use data from 2015 was used to create most of these maps. As with NAS Fort Worth, JRB, land uses were aggregated to improve the readability of maps.

Redmond Taylor Army Heliport (**Figure 26**) is located in the City of Dallas, the ninth-largest city in the United States, with a population of more than 1.2 million, according to 2015 American Community Survey 5-Year Estimates. The City of Grand Prairie neighbors this installation.

In 2006, the Dallas City Council adopted the forwardDallas! Comprehensive Plan. While the plan did not generate a traditional future land use plan, it illustrated a vision for land use in the city. The illustration indicates that the Redmond Taylor Army Heliport and neighboring land would likely remain an industrial area (**Figure 27**).

COL James L. Stone US Army Reserve Center (**Figure 28**) and Eagle Mountain Lake Training Site (**Figure 29**) are located in areas that are less urban than NAS Fort Worth, JRB but still face some pressure from residential development. Fort Wolters (**Figure 30**) and Camp Maxey (**Figure 31**) are located in more rural areas. Camp Maxey is located outside the area for which RIS provides land use data, so the installation's land-use map uses data from the National Land Cover Database 2011, which is created by the Multi-Resolution Land Characteristics Consortium. This data source provides fewer development categories and emphasizes differences in vegetation.

Figure 26

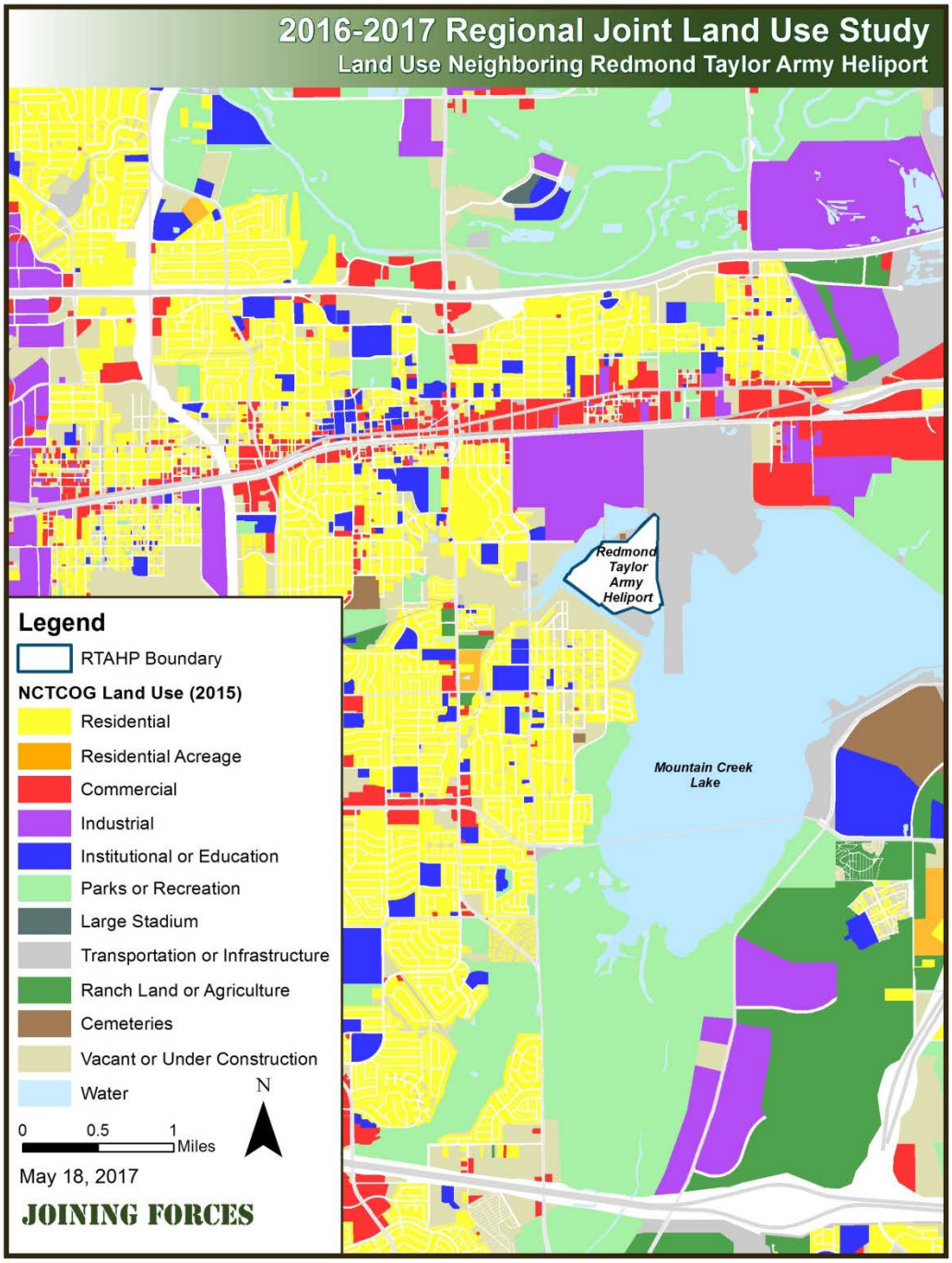

2016-2017 Regional Joint Land Use Study
Land Use Neighboring Redmond Taylor Army Heliport
Redmond Taylor Army Heliport
Mountain Creek Lake
Legend
RTAHP Boundary
NCTCOG Land Use (2015)
Residential
Residential Acreage
Commercial
Industrial
Institutional or Education
Parks or Recreation
Large Stadium
Transportation or Infrastructure
Ranch Land or Agriculture
Cemeteries
Vacant or Under Construction
Water
N
0
0.5
1
Miles
May 18, 2017
JOINING FORCES

Figure 27

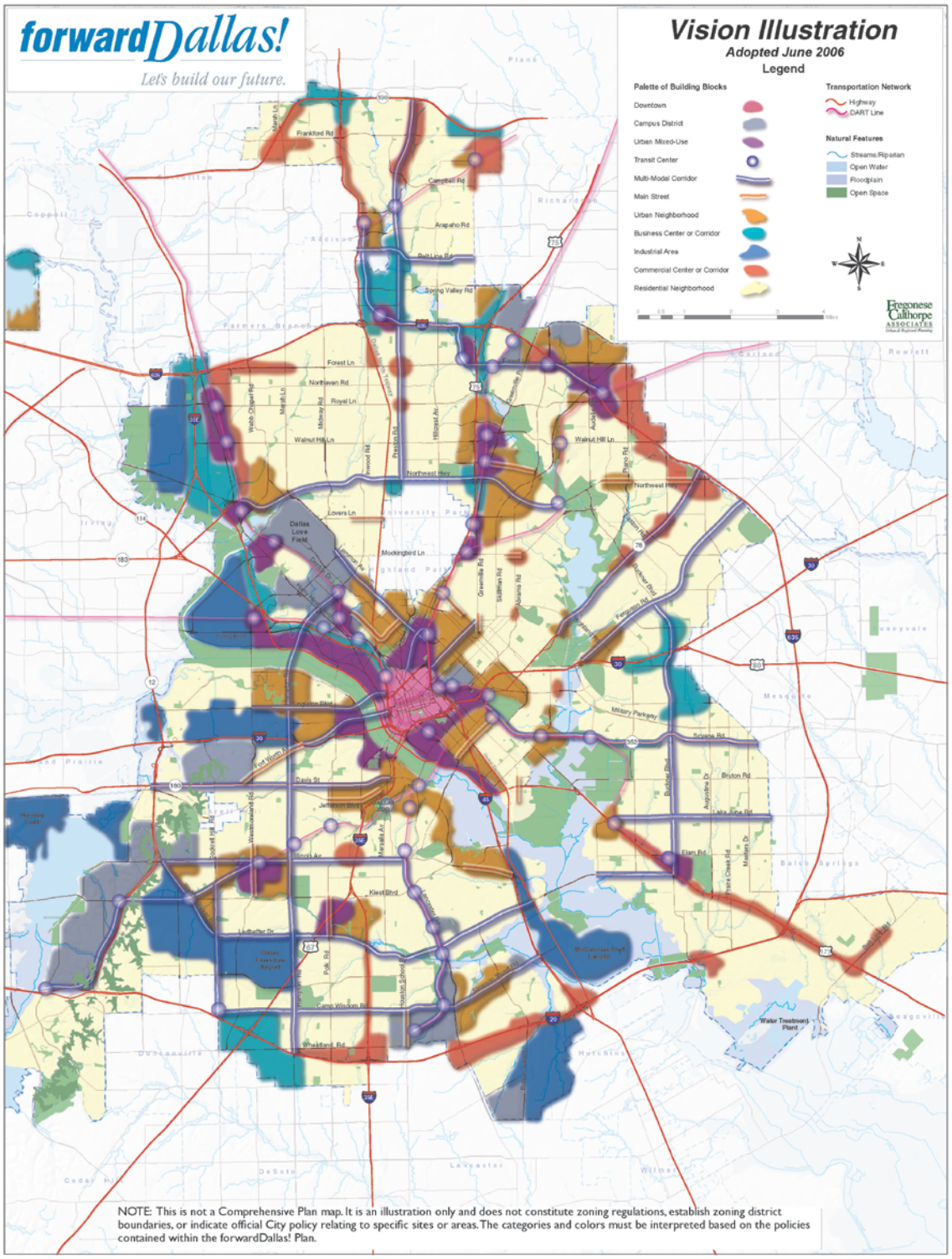

forwardDallas!
Let's build our future.
Vision Illustration
Adopted June 2006
Legend
Palette of Building Blocks
Downtown
Campus District
Urban Mixed-Use
Transit Center
Multi-Modal Corridor
Main Street
Urban Neighborhood
Business Center or Corridor
Industrial Area
Commercial Center or Corridor
Residential Neighborhood
Transportation Network
Highway
DART Line
Natural Features
Streams/Riparian
Open Water
Floodplain
Open Space
Fregonese Calthorpe Associates
NOTE: This is not a Comprehensive Plan map. It is an illustration only and does not constitute zoning regulations, establish zoning district boundaries, or indicate official City policy relating to specific sites or areas. The categories and colors must be interpreted based on the policies contained within the forwardDallas! Plan.

Figure 28

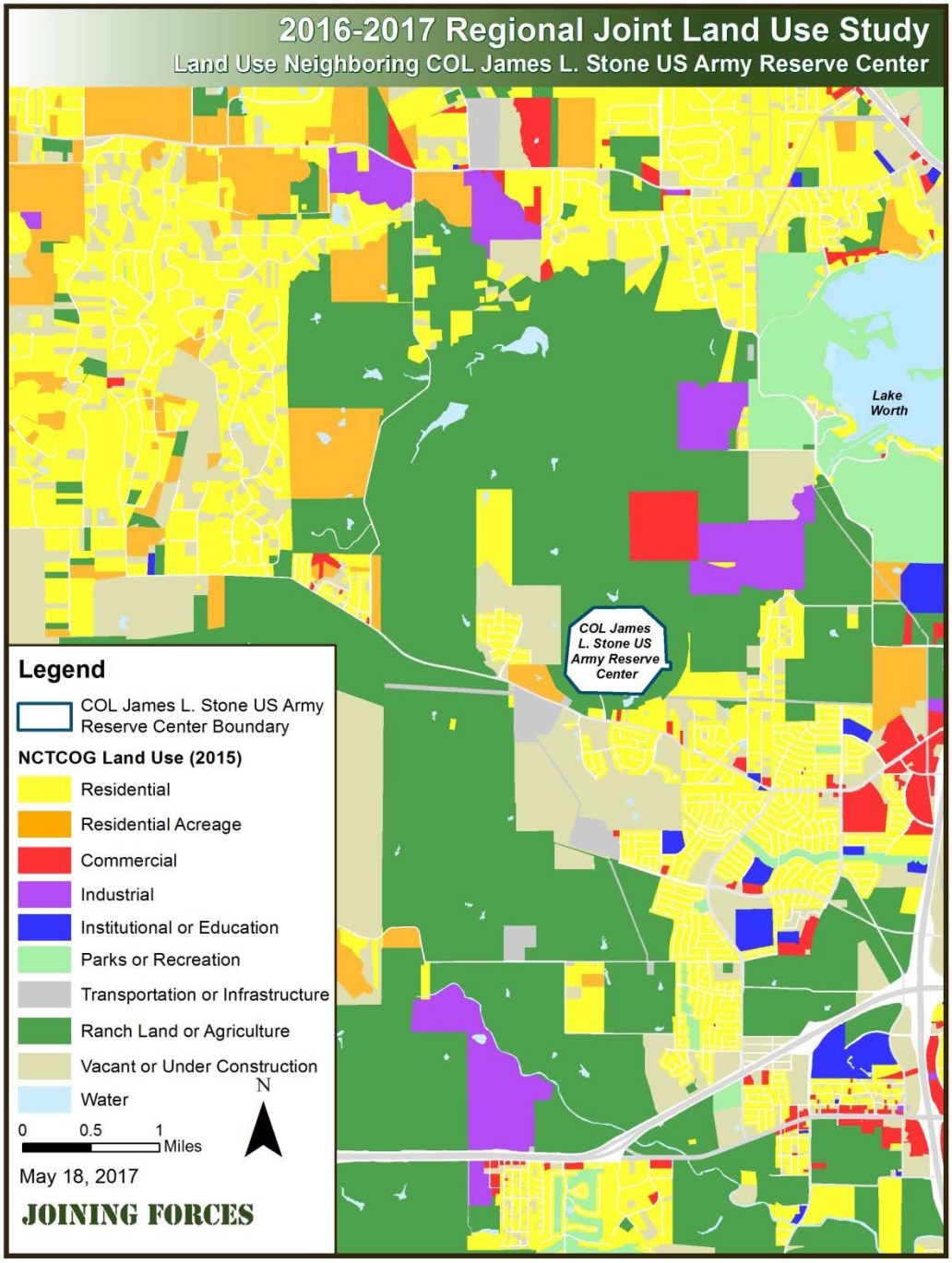

2016-2017 Regional Joint Land Use Study
Land Use Neighboring COL James L. Stone US Army Reserve Center
Lake Worth
COL James L. Stone US Army Reserve Center
Legend
COL James L. Stone US Army Reserve Center Boundary
NCTCOG Land Use (2015)
Residential
Residential Acreage
Commercial
Industrial
Institutional or Education
Parks or Recreation
Transportation or Infrastructure
Ranch Land or Agriculture
Vacant or Under Construction
Water
N
0 0.5 1 Miles
May 18, 2017
JOINING FORCES

Figure 29

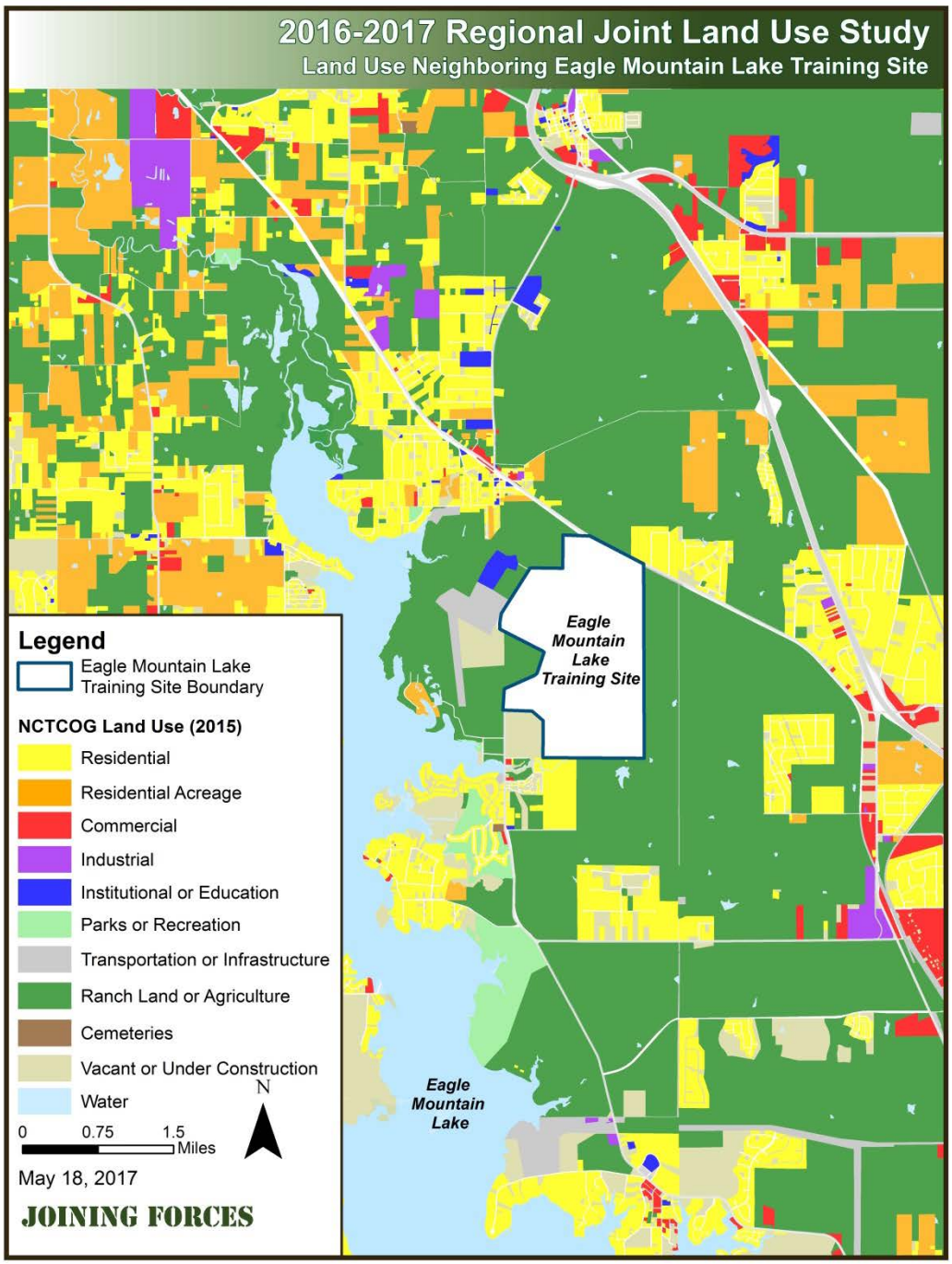

2016-2017 Regional Joint Land Use Study
Land Use Neighboring Eagle Mountain Lake Training Site
Legend
Eagle Mountain Lake Training Site Boundary
NCTCOG Land Use (2015)
Residential
Residential Acreage
Commercial
Industrial
Institutional or Education
Parks or Recreation
Transportation or Infrastructure
Ranch Land or Agriculture
Cemeteries
Vacant or Under Construction
Water
N
0
0.75
1.5
Miles
May 18, 2017
JOINING FORCES
Eagle Mountain Lake Training Site
Eagle Mountain Lake

Figure 30

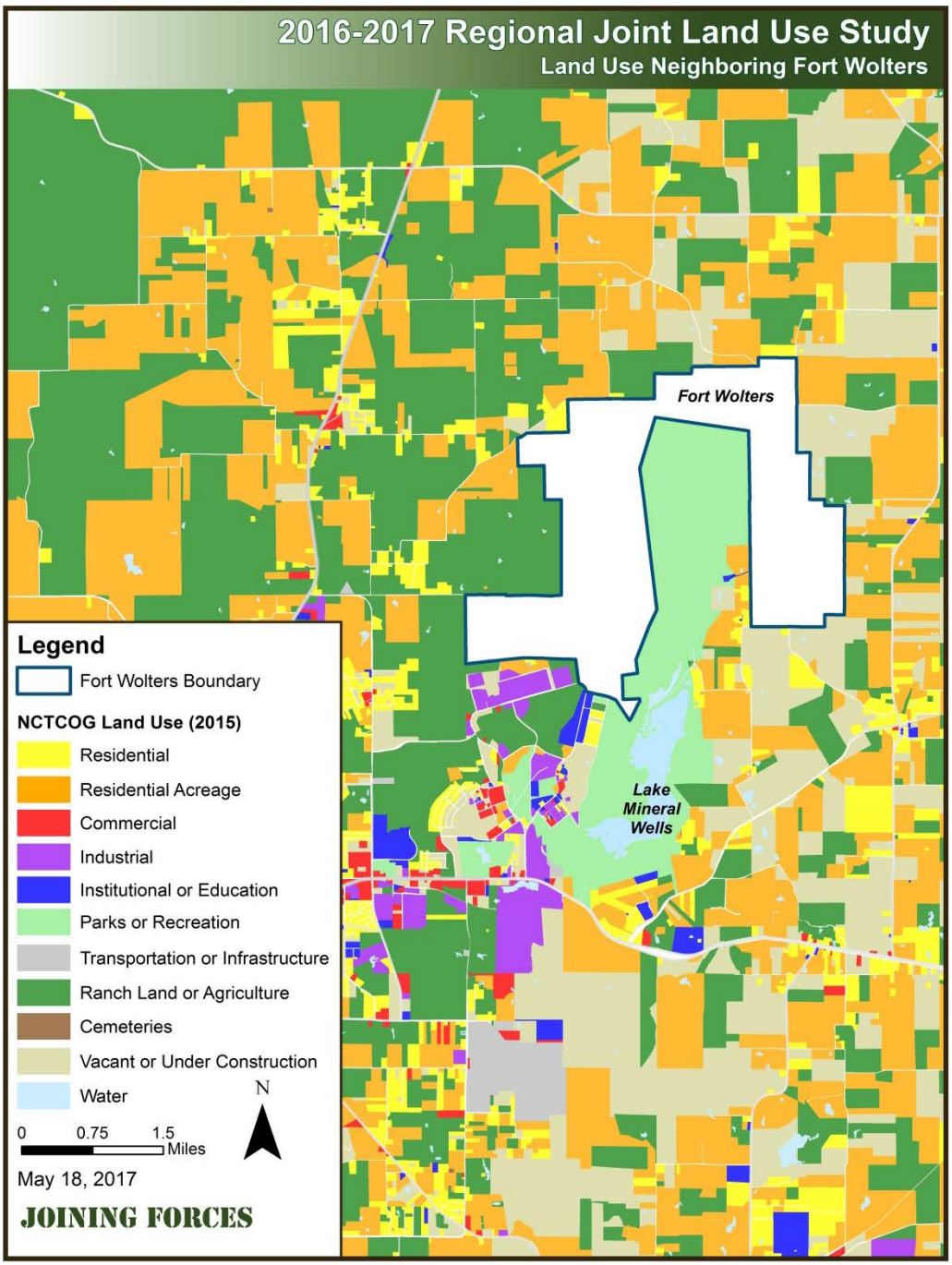
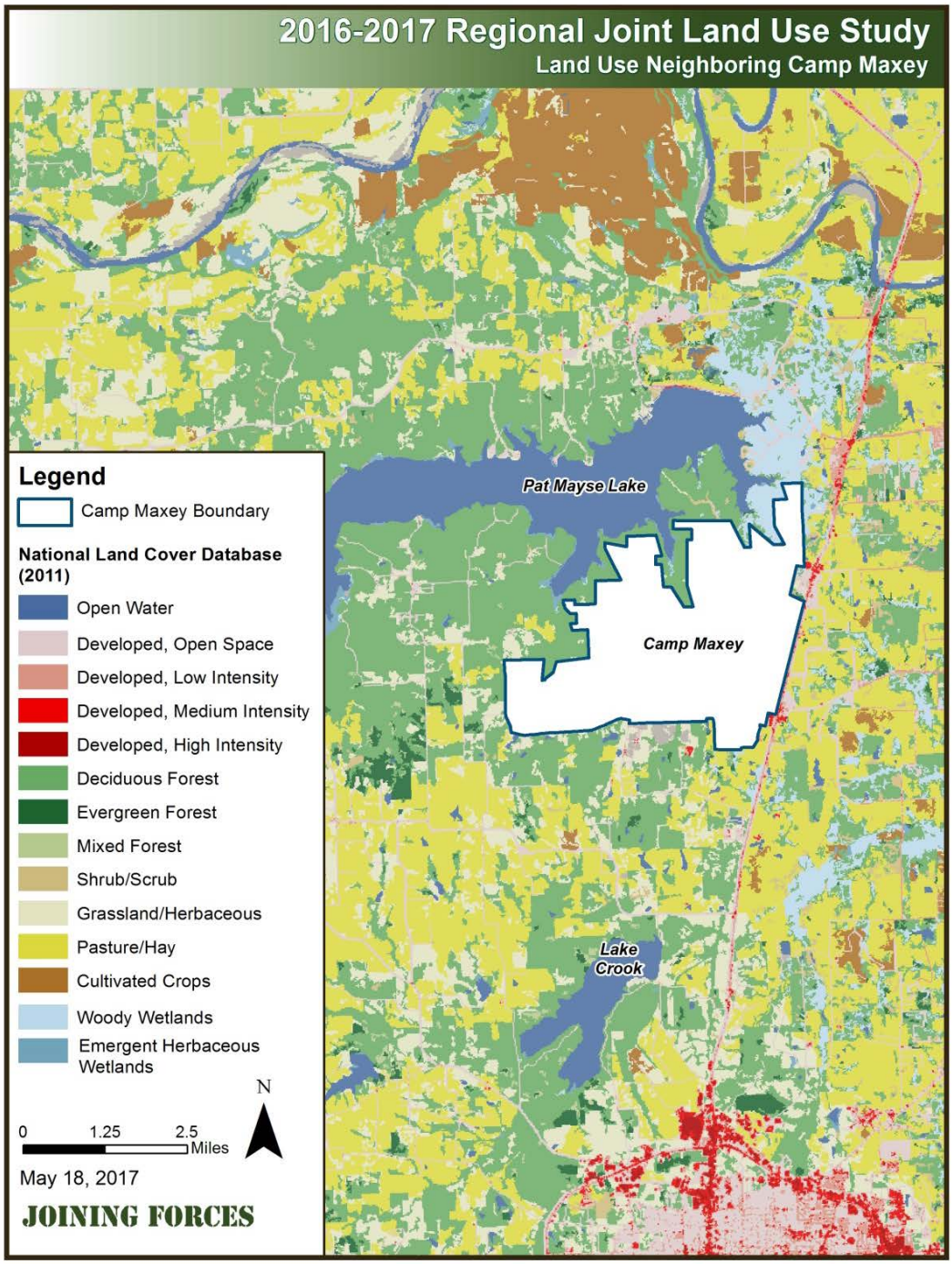

2016-2017 Regional Joint Land Use Study
Land Use Neighboring Fort Wolters
Fort Wolters
Lake Mineral Wells
Legend
Fort Wolters Boundary
NCTCOG Land Use (2015)
Residential
Residential Acreage
Commercial
Industrial
Institutional or Education
Parks or Recreation
Transportation or Infrastructure
Ranch Land or Agriculture
Cemeteries
Vacant or Under Construction
Water
N
0 0.75 1.5 Miles
May 18, 2017
JOINING FORCES

Figure 31


2016-2017 Regional Joint Land Use Study
Land Use Neighboring Camp Maxey
Legend
Camp Maxey Boundary
National Land Cover Database (2011)
Open Water
Developed, Open Space
Developed, Low Intensity
Developed, Medium Intensity
Developed, High Intensity
Deciduous Forest
Evergreen Forest
Mixed Forest
Shrub/Scrub
Grassland/Herbaceous
Pasture/Hay
Cultivated Crops
Woody Wetlands
Emergent Herbaceous Wetlands
N
0
1.25
2.5
Miles
May 18, 2017
JOINING FORCES
Pat Mayse Lake
Camp Maxey
Lake Crook

Technical Appendix F.

RCC Development Review Tool Memo

Assessment and Recommendations for RCC Development Review Web Tool

Introduction

The Development Review Web Tool is a website created by the North Central Texas Council of Governments (NCTCOG) on behalf of the local governments surrounding Naval Air Station Fort Worth Joint Reserve Base (NAS Fort Worth JRB). It was created as a result of recommendations in the Joint Land Use Study (JLUS) completed in 2008. The tool serves as a forum for local governments to communicate about compatibility of land uses in the vicinity of the base. Compatible land uses are those that are consistent with the Air Installation Compatible Use Zone Program (AICUZ). The principal users of the tool are members of the Regional Coordination Committee (RCC), which is composed of staff and elected officials from the local governments surrounding the installation, the installation, and NCTCOG staff. Participating governments include the cities of Benbrook, Fort Worth, Lake Worth, River Oaks, Sansom Park, Westworth Village, and White Settlement; along with Tarrant County. The role of NCTCOG has been to create and maintain the web tool in order to foster open communication between the local governments and the installation.

An analysis of the tool was performed by NCTCOG staff to find out why usage has declined and what actions may be taken to encourage increased participation. The methods of reviewing the Development Review Web Tool include a SWOT analysis (strengths, weaknesses, opportunities, and threats), staff review of the web and mapping components, and a user survey. The goals of the overall analysis were to assess the tool's functionality, gauge attitudes and perceptions, and identify barriers to use of the tool. This type of analysis can form the basis of a proactive strategic plan to encourage participation in the communication tools that support the Joint Land Use initiatives.

From 2008 through June 2017, 69 projects were entered for comment. The process of reviewing a project for compatibility begins when a representative of an RCC member entity enters details of the project(s) (development sites, comprehensive plan updates, or others) for the municipality into the tool. During a defined period, representatives from NAS Fort Worth JRB and members of other RCC governments may review and comment on the proposed project. Comments focus on whether the site is compatible with the Navy's AICUZ land use classification. The comments typically include considerations like noise or sound attenuation, height obstruction, and floor-area-ratio, among many other factors. The following maps were created by NCTCOG staff to show the locations of the projects entered into the tool (see **Figures 1-3**). They also display the city limits near NAS FW JRB, and whether or not the proposed development was determined to be compatible.

Figure 1: Locations of Development Sites Entered into the Development Review Web Tool

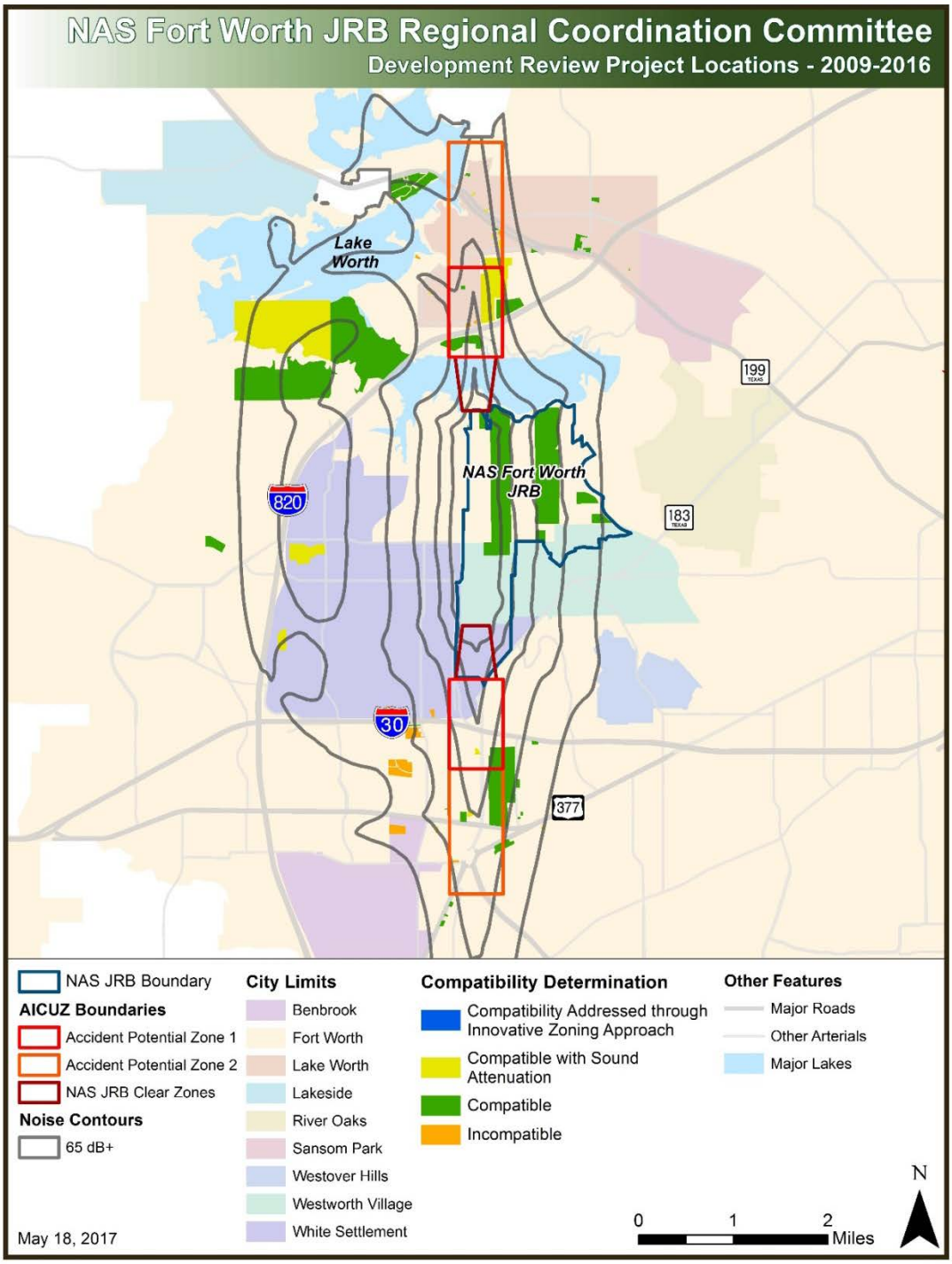


Figure 2: Projects Entered, North Study Area

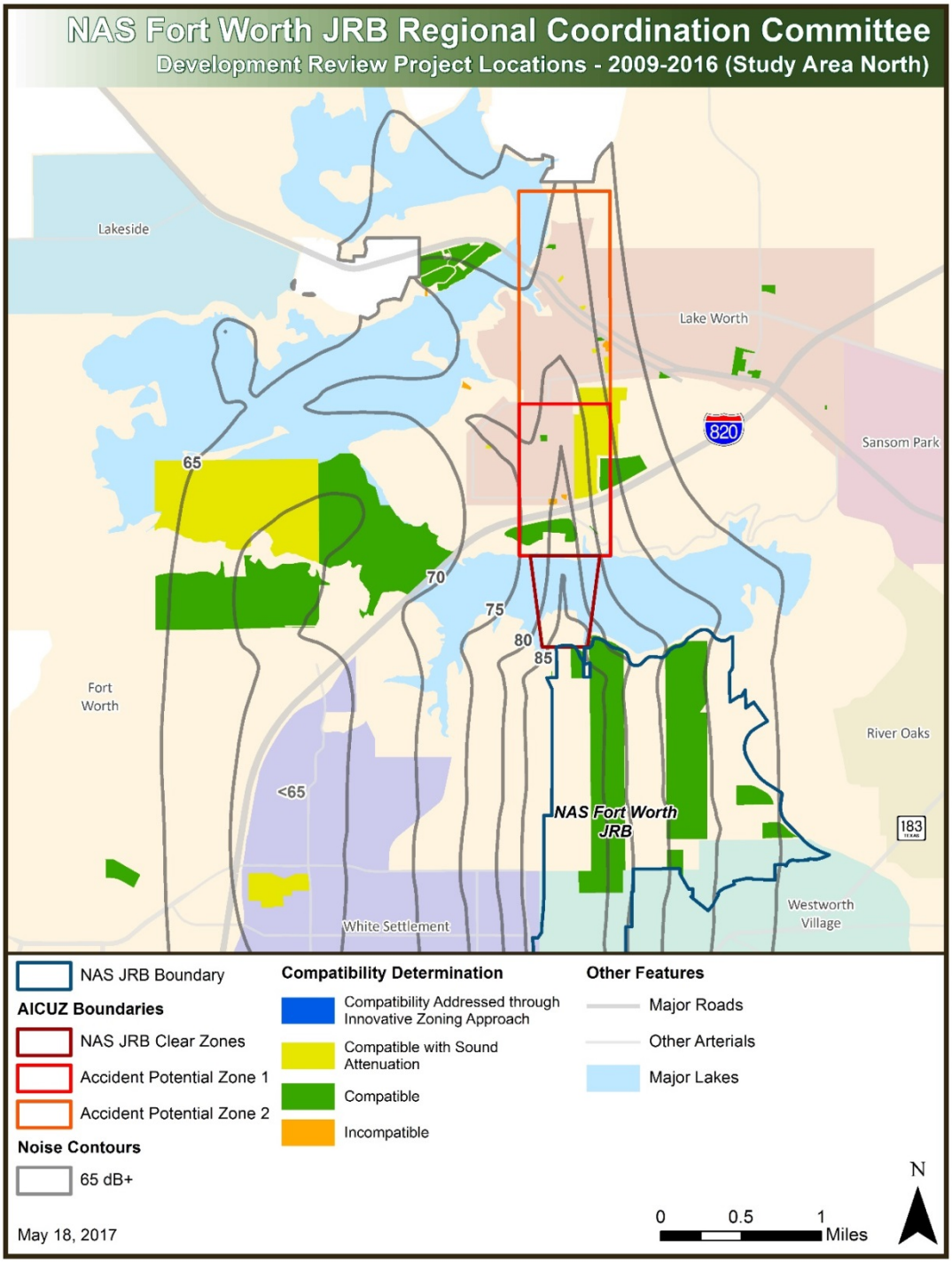
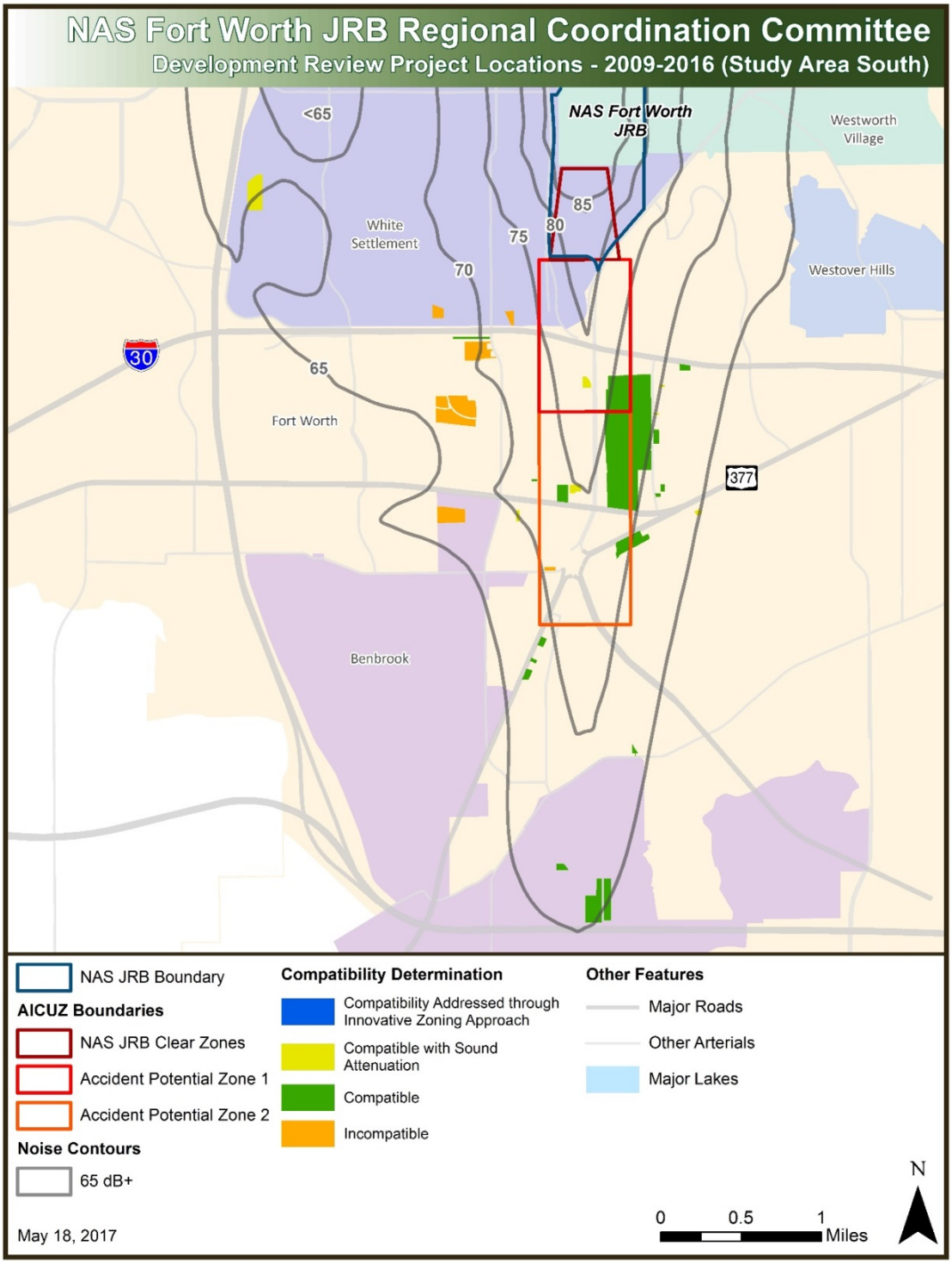


Figure 3: Projects Entered, South Study Area



While the number of projects increased in the first few years, a decline in the number of annual entries occurred after about 2013 (See **Figure 4**). There have been no projects entered into the tool since August 2016. The City of Fort Worth entered the most projects overall with 37, and Lake Worth followed with 23 entries. Benbrook and River Oaks members uploaded four projects each, and White Settlement representatives uploaded one project. Sansom Park and Westworth Village entered zero projects each (See **Figure 5**).

Figure 4: Total Entries to Development Review Web Tool by Year

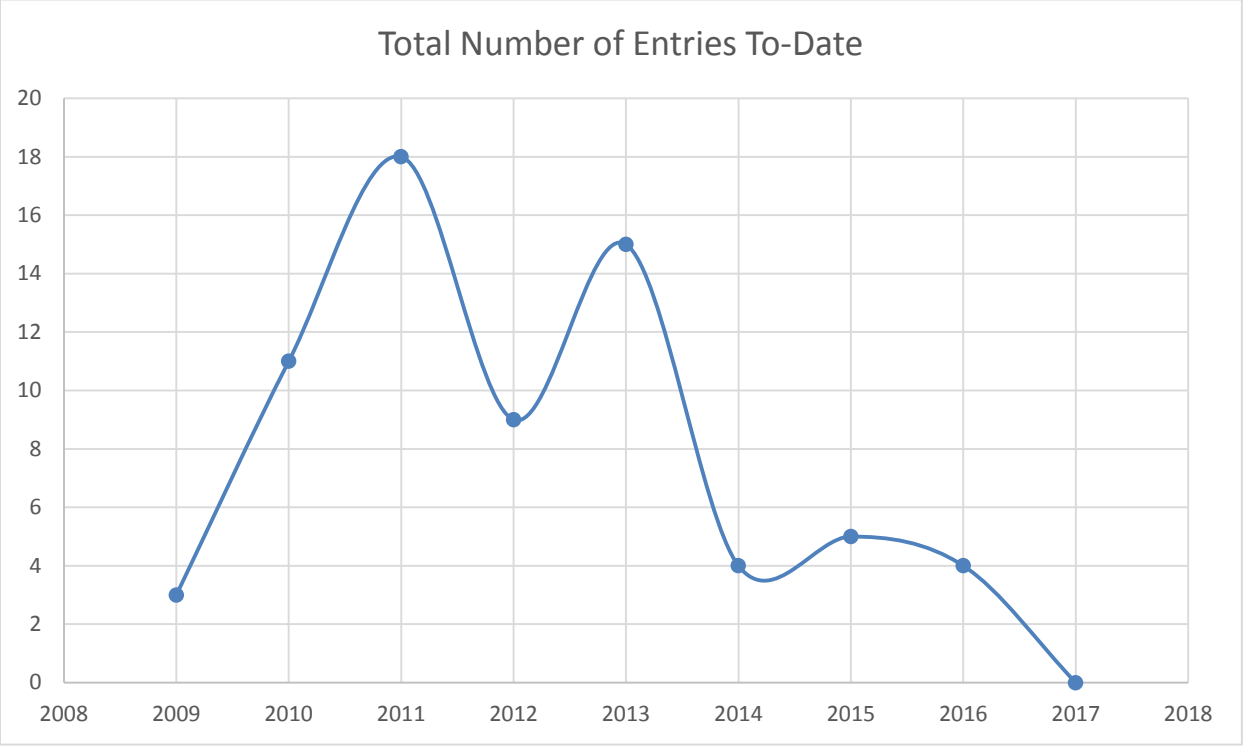


Figure 5: Total Entries from 2009-2016, by Municipality

Entity	Number of Entries
City of Benbrook	4
City of Fort Worth	37
City of Lake Worth	23
City of River Oaks	4
City of Sansom Park	0
City of Westworth Village	0
City of White Settlement	1
Tarrant County	0
Grand Total	**69**

Input from NAS Fort Worth JRB

A discussion was held during a Policy Committee meeting for the Joining Forces project regarding improvements that could be made to improve usage of the Development Review Web Tool. As part of that discussion, NAS Fort Worth JRB was asked what types of actions by local governments would be useful to upload into the tool. In general, NAS Fort Worth JRB is interested in a holistic compatibility review, which can be achieved through parcel-specific information such as amendments to comprehensive plans, thoroughfare plans, zoning changes, variances, subdivision plats, development plans, annexations, etc., but also through larger scale actions like zoning ordinance amendments, endangered species issues, lighting issues, etc.

Assessment

SWOT Analysis

A simple SWOT analysis was performed (**Figure 6**). Strengths and weaknesses are internal characteristics that can be changed by the agency. In terms of the Development Review Web Tool, examples include the performance of the website or the support that NCTCOG lends to the local governments. Opportunities and threats are those positive and negative characteristics that are external to NCTCOG and cannot be changed by the agency. These include the market demand for development or local government budget and staffing constraints. For the purposes of reviewing the Development Review Web Tool, a four-section chart was filled in with bulleted lists of the strengths, weaknesses, opportunities, and threats. These, combined with the staff review and survey results analysis, produce suggested improvements to the Development Review Web Tool.

Figure 6: SWOT Analysis Chart

ANALYSIS OBJECTIVES

Determine internal and external factors for the Development Review Web Tool; determine strengths and weaknesses in order to build an adaptive strategy for future updates to the tool; assess any changes in the environment or market that may have occurred since the tool's inception; and determine ways to prioritize improvements or strategies.

INTERNAL FACTORS

STRENGTHS (+)	WEAKNESSES (-)
• Forum/channel for open communication • NCTCOG provides regional perspective • Contains resources for RCC members • Training available upon request	• No recurring training – upon request only (asking for training may be a barrier) • Outdated web design is not as user friendly • Technical staff (zoning technicians, planners, etc.) aren't always the ones entering projects, and the RCC members may not be aware of all projects • NCTCOG budgets and deadlines may limit ability to update tool

EXTERNAL FACTORS

OPPORTUNITIES (+)	THREATS (-)
• Training of staff and RCC members available, possibly make annual/biannual/new hire • NCTCOG open to updating website • Turnover of staff or RCC members could mean fresh perspectives, open minds • Incorporating the tool into existing workflows may make it easier to use	• Local government officials are subject to budgets, deadlines, and may lack will to use tool • RCC member and staff turnover rate • Turnover of RCC members and staff may result in fewer people using tool: knowing it exists, knowing why it exists, and how to use it • Tool is voluntary and municipalities can choose not to use If development in an area slows there may be no projects to enter • Use is subject to demand for development • Local governments may be reluctant to communicate openly about redevelopment • Determining compatibility is complex with many facets and conditions/preconditions

EVALUATION OF OBJECTIVES

NCTCOG should confirm goals of tool

1. Training: setting annual or biannual sessions may remove barrier of asking for training; new member sessions for RCC should be encouraged; technical staff should be encouraged to attend as well as RCC members
2. Future mobile app and streamlined web design could encourage use; improving readability could increase credibility of tool
3. Determine other metrics to measure success of tool besides number of projects entered, such as outcomes (including level and quality of communication)

Staff Review

NCTCOG staff reviewed the Development Review Web Tool to determine ease of use. Comments on the tool address the following categories: the overall website, mapping component, and suggested improvements. In order to update the look and feel of the Development Review Web Tool, some changes to the website should be made, which would increase credibility of the tool by creating a sense of trust, organization, and authority.[12] The tool is part of a broader visual representation of the quality of the work being performed, as well as what the future looks like. A stagnant website conveys a lack of credibility and initiative, while an updated website demonstrates that fostering communication is an ongoing priority. Suggestions for enhancing the user experience include updating user information and content; reorganizing content displays to make the site easier to navigate; and drawing attention to linked resources.

Over the past year, there has been turnover of several RCC members and staff and many of these individuals have not yet received account information. At this time, an updated list of accounts is needed to include new RCC members and staff who don't yet have an account.

Navigation on the page could also be streamlined. Currently, users must rely on embedded links to move forward, but then use the browser's back button to return back a level. Providing links to return to the project listing page would streamline the user experience. The links to the AICUZ document should be made more visible, as it is the driver for determining compatibility. Also suggested is the inclusion of a descriptive heading on the project page, as well as a

[12] Mark Brinker, "Research Shows Having a Bad Website Can Hurt Your Business," *Mark Brinker & Associates*, 3 March 2017. http://www.markbrinker.com/a-bad-website-can-hurt-your-business; "Consequences of an outdated website," *forinsite*, 3 April 2015. http://www.forinsite.com/blog/comments.cfm?id=1&blogid=4

summary of the commenter's recommendation. This would allow the reader to assess the context and recommendations quickly, which may be of particular importance to busy users.

A review of the mapping component of the web tool addressed technical mechanisms and cartographic appearance. After the initial review, a meeting was held with staff who maintain the web tool, and a list of suggested improvements determined to be feasible was made and ranked by importance. The tool uses an older type of Flash player called Flex Builder. The mapping component could be redesigned in ArcGIS Online, which would allow for a cleaner appearance and up-to-date functionality and spatial data management. However, this would require agreements and permissions, the details of which could take some time to finalize.

Trends in graphic design and cartography are shifting towards a cleaner, less detailed visual display. Dynamic layers that can be turned on or off enable the user to find as much or as little information as they need. Giving users options and control engages users as they interact with the site. Staff suggested other changes to improve the readability of the map component, such as improving transparency of layers, color choice, and labels. A table of suggested changes, along with their rankings of importance, is located in **Figure 7**.

Figure 7: Suggested Improvements to Website and Mapping Component

Suggested Improvements to RCC Development Review Web Tool	
Item	**Priority Ranking**
Update user accounts	High
Update legend descriptions for noise contours to reflect the range	High
Add a column to comments table called "Recommendation" with four choices: compatible; incompatible; compatible with sound attenuation; and compatible with other conditions	High
Add a very visible link to OPNAV in the References box	High
Update color choice and transparency to address blending of colors/reduced readability	High
Provide clear instructions for uploading non-parcel-specific information for review	High
Move or duplicate the "return to project listing" link from the bottom to the top of the page	Medium
Include a qualitative/descriptive heading under Project Details	Medium
Have dynamic layers in map that can be turned on or off	Low
Change label style for streets so they recede into the background	Low
Set the initial scale so it is zoomed out more for context	Low

User Survey: Response Discussion

A survey was conducted to gauge attitudes and perceptions from the RCC members and others who use the tool. The survey included 13 questions, which are found in **Attachment 1**. Question topics range from frequency of use to satisfaction with the tool. The questions were developed by NCTCOG staff and the survey was disseminated via the online survey tool Survey Monkey.

Four responses were received from the survey out of an estimated 14 recipients, for about a 28% response rate. One user reported not using the tool, while three users reported they do use the tool. The respondent who does not use the tool cited a lack of time available to devote to using the tool, but reported good communication with NAS Fort Worth JRB. Out of the three respondents who use the tool, one reported there is a designated person responsible for using the tool, while two responded that there is no designated person. The one designated person's

job title was reported as planner or staff member. This indicates that there are a variety of workflow structures within local governments, some perhaps having more staff and resources than others. This response also points to a varying level of integration of the tool into established workflows, with some local governments integrating the tool more than others.

When asked how respondents use the tool, two out of three said they do not upload projects, but all three said that they comment on projects. One open-ended response reported that there is a "disconnect" between RCC members and those staff who deal with development site applications every day. The respondent requested training for staff and committee members, including how to use the tool and why it exists. A second respondent said they do not upload projects because there are "no planned developments within the noise zones of the Base." This highlights the relationship between development on the ground and entries to the tool. The decrease in entries to the tool could reflect a decrease in developments in the area, but further investigation is required to determine whether this is true. Although there are varying responses about the use of the tool, two out of three respondents reported that the tool is influential to the decision-making process.

The survey asked how frequently local governments upload specific types of projects into the tool. A list of ten project types was given, such as sound attenuation, site plan application review, and subdivision plat approval. The majority of responses stated that respondents never used the tool for the choices given, with 100% of respondents reporting that they never use the tool for sound attenuation or utility plans. One respondent said they use the tool "rarely" for height obstruction. Seven out of ten categories were "sometimes" used by one respondent. The Survey Monkey tool compiled results into one table, so it is not clear which combination of responses each participant entered. No respondent said they "always" or "frequently" used the tool for any project type. When asked why they used the tool "rarely" or "never," respondents had a variety of open-ended responses. One reported that there were no planned developments within the noise contours. Another said simply that they did not use the tool.

The third respondent reiterated that they may have projects to upload, but that they would "need to get staff involved in the process."

When asked what the purpose of the tool should be, three options were provided: to prevent incompatible development, to make incompatible development compatible, or other. Respondents could select all options that applied. Each option was selected twice. One respondent who marked "other" said that the purpose of the tool should be to "provide a means of advisory communication" between NAS Fort Worth JRB and the local governments. The second response in the "other" category indicated that the purpose should be to coordinate projects and communication of land use. The responses indicate that the local governments have different interpretations of the tool's goal and varying needs for the tool.

The next series of questions asked about effectiveness and ease of use; 75% reported that the Development Review Web Tool is "somewhat effective" in meeting the purpose of the tool. One response (25%) reported that the tool is "neither effective nor ineffective." No respondent reported that the tool is "ineffective." In the question about the respondents' satisfaction with ease of use, three out of four said they are "somewhat satisfied," while one out of four said they are "neither satisfied nor dissatisfied." No one reported that they are dissatisfied with the ease of use or effectiveness of the tool; however, responses indicate there is room for improvement.

The final three questions are open-ended and ask direct opinions on what NCTCOG can do to improve the tool. When asked if there was anything NCTCOG could do to make entering or uploading projects a better experience, one response was "No," which suggests there may be dynamics external to NCTCOG affecting the decision to use the tool. Another response asked for training, and another reported that they "have not personally used the tool." Barriers to use of the tool can be addressed by implementing training as part of a strategic plan to increase use of the tool. The last question, which asks if training would be helpful, received a 100% "yes" response.

Conclusions

The Development Review Web Tool is currently an open forum for communication between local governments and NAS Fort Worth JRB about land uses. Because of declining use of the tool, an analysis was conducted to assess the tool's functionality, gauge user attitudes and perceptions, and identify possible barriers to use of the tool. The next step is to utilize the data compiled in this analysis and create a set of suggestions that will capitalize on the tool's strengths and minimize its current vulnerabilities. Suggested improvements align with the issues identified in the SWOT analysis, staff review, and user survey. While survey results show that users feel that the tool is important, and even somewhat effective at its purpose, the decline in usage points to a need for improvement. Figures 6-7 suggest specific actions related to the Development Review Web Tool and NCTCOG's role in maintaining and promoting it. A combined, broad set of strategies suggested for improving the tool are as follows:

- Providing training, particularly to new RCC members and planning and technical staff, should form an essential component of the strategic plan to improve the Development Review Web Tool;
- Aligning the tool with municipalities' existing workflows could make the tool easier to use by allowing users to incorporate it into their daily activities; and
- Updating the web design and mapping component of the tool would renew a sense of initiative. Updating the mapping component of the tool in a program like ArcGIS Online would enable better data collection and spatial data management, as well as convey a sense of importance of the land use communication initiatives. Incorporating additional categories such as zoning overlays would make the tool more robust and useful for the end user.

This assessment recommends that NCTCOG provide staff support to monitor announcements of development, redevelopment, and planning projects in the communities neighboring NAS Fort Worth JRB, consistent with the information that will be most useful to the base and

communities to review for compatibility. This assessment also recommends the development of a strategic plan to improve the Development Review Web Tool. NCTCOG, as steward of this communication channel, is seeking to increase usage of the tool. But while the number of entries is an important metric to gauge the success of the Development Review Web Tool, there are other factors to consider in determining its viability, like the level and quality of communication. Facilitating and maintaining good communication between NAS Fort Worth JRB and local governments is at the core of the tool's functionality. No matter which improvements are made or incorporated into future plans, maintaining the current positive, communicative environment should be preserved.

Technical Appendix G.

Model Energy Infrastructure Permitting Process

Declaration of Department of Defense Notification

Interconnecting Entity (IE):_____

This declaration applies to the following proposed Generation Resource:_____

Check the below listed attestation(s) which apply to the Generation Resource.

I hereby attest that:

____ This IE has notified the Department of Defense (DOD) Siting Clearinghouse of the above listed proposed Generation Resource and requested that it perform an Informal Review and/or Formal Review as described in 32 C.F.R. § 211.1 (2013);

____ This IE has completed the formal review process for the Generation Resource with the Department of Defense (DOD) Siting Clearinghouse and Federal Aviation Administration (FAA), as described in 14 C.F.R. § 77.7 (2010) and 32 C.F.R. § 211.6 (2013); or

____ The above listed proposed Generation Resource is exempt from the requirement to seek review from the Department of Defense (DOD) and the Federal Aviation Administration (FAA), as described in 14 C.F.R. § 77.7 (2010) and 32 C.F.R. § 211.6 (2013).

By signing below, I certify that I am an officer, executive, or authorized employee with authority to bind the IE listed above, that I am authorized to execute and submit this declaration on behalf of each IE listed above, and that, to the best of my knowledge, the statements contained herein are true and correct.

_____
Signature

_____
Name

_____
Title

_____
Date

STATE AND LOCAL GOVERNMENT ENERGY-RELATED SITING PROCESSES
(as of 10/20/15)

Purpose: The following references cite state and local laws of interest to the mission compatibility evaluation process. Updates to this list are welcomed; please forward your input to the DoD Siting Clearinghouse at: osd.dod-siting-clearinghouse@mail.mil

California

California Government Code sections 65040.2, 65040.9, 65302, 65302.3, 65352, 65404, 65560, 65583, 65940, and 65944, as well as California Public Utilities Code section 21675, relate to local planning consideration of impacts to military activities.

Scope: These provisions of law outline how local governments notify the military of certain local planning proposals and development permit applications and inform the military of certain local land use proposals to prevent land use conflicts between local communities and military installations and training activities. Local governments must notify branches of the military when proposed general plan actions and amendments and development projects might have an impact on military facilities and operations. Local governments must consider the impact of development on military readiness activities when preparing or updating their general plan. The law encourages cooperation between military installations and local communities to reduce land use conflicts between civilian development and military readiness activities. It identifies specific requirements about when and where local governments must incorporate military readiness activities into the general plan. The State Office of Planning and Research has published an advisory planning handbook for local officials, planners, and developers: the *California Advisory Handbook for Community and Military Compatibility Planning* (OPR Handbook), published in 2006.
http://opr.ca.gov/docs/Complete_Advisory_Handbook_2006.pdf

California Military Land Use Compatibility Analyst (CMLUCA)
http://cmluca.gis.ca.gov/
Scope: A mapping tool that local governments and developers can use to identify whether proposed planning projects are located in the vicinity of military bases, military training areas, or military airspace. This mapping tool helps local governments and developers comply with state law that requires the military to be notified of certain development applications and general plan actions.

Community and Military Compatibility Planning, Supplement to the General Plan Guidelines
http://opr.ca.gov/docs/Military_GPG_Supplement.pdf
Scope: Assists cities and counties in addressing military compatibility issues when developing, updating or significantly amending their general plans.

Kern County Code of Ordinances, Title 19-Zoning, Chapter 19.08, section 19.08.160.
https://www.municode.com/library/ca/kern_county/codes/code_of_ordinances?nodeId=TIT19ZO_CH19.08INGEST
Scope: provides a map where no zone modification or zone variance may be approved, and no building permit may be issued where a zone modification or zone variance is not required, for any structure or building that exceeds the maximum permitted heights shown in Figure 19.08.160 unless the military authority responsible for operations in that flight area first provides the planning director with written concurrence that the height of the proposed structure or building would create no significant military mission impacts.

Riverside County Military Notification Process for Local Planning Proposals and Development Permit Applications
http://www.riversideca.gov/planning/pdf/application-forms/H-05-0067-SB-1462.pdf
Scope: Provides a map of Joint Reserve March with a 1000 foot exclusion zone, and identifies a review process for seeking joint service review of projects within the zone.

Montana

Cascade County Growth Planning Map

http://www.cascadecountymt.gov/doc/growthpolicy2014maps.pdf

Scope: provides a conflict map between Malmstrom AFB and the missile fields depicting areas of impact to DoD readiness and operations.

New York

New York Codes, Rules and Regulations, Title 16. Department of Public Service, Chapter X. Certification of Major Electric Generating Facilities, Subchapter A. Regulations Implementing Article 10 of the Public Service Law as Enacted by Chapter 388, Section 12, of the Laws of 2011, Part 1001. Content of an Application; 16 NYCRR § 1001.25 (2015).

https://www3.dps.ny.gov/W/PSCWeb.nsf/96f0fec0b45a3c6485257688006a701a/143595fa3be36 aea852579d00068b454/$FILE/Article%2010%20Regulations.pdf

Scope: Article 10 provides for the siting review of new and repowered or modified major electric generating facilities in New York State by the Board on Electric Generation Siting and the Environment (Siting Board) in a unified proceeding. Part 1001 of Chapter X requires the applicant to receive an informal Department of Defense review of the proposed construction or alteration or a formal Department of Defense review of the proposed construction or alteration in accordance with 32 CFR Part 211.

North Carolina

General Statutes of North Carolina, Chapter 143, Article 21C (Permitting of Wind Energy Facilities), § 143-215.115 through § 143-215.126.

http://www.ncleg.net/Sessions/2013/Bills/House/PDF/H484v9.pdf

Scope: North Carolina's permitting process for wind energy facilities. Explicitly solicits input from installation commanders and their staffs regarding the possible impact of construction and operation of a wind turbine facility on DoD readiness and operations.

Oregon

Oregon Revised Statutes, Title 36 (Public Health and Safety), Chapter 469-Energy; Conservation Programs; Energy Facilities Regulation of Energy Facilities (Siting); ORS § 469.320 et seq. http://www.oregonlaws.org/ors/469.320

Scope: Oregon Energy Facility Siting Council manages the site permitting process. No declarative DoD role. However, DoD may petition for status before the council to raise potential concerns, within the state's regulatory authority, regarding a renewable energy project that might impact DoD readiness and operations. 2

Oregon Model Ordinance for Energy Projects

http://www.oregon.gov/energy/Siting/docs/ModelEnergyOrdinance.pdf

Scope: No declarative DoD role. A Guide for Oregon Cities and Counties on siting renewable energy projects

Virginia Model Ordinance Utility-Scale Wind Energy Projects in Virginia:

http://www.deq.virginia.gov/Portals/0/DEQ/RenewableEnergy/4%204%202012%20Util%20Sca le%20Model%20Ord%20formatted.docx

Scope: Provides suggested language for consideration by localities in framing their own local wind ordinance for utility-scale wind energy projects, and suggests developers provide a courtesy notice to the DoD Siting Clearinghouse and the US DoD REC.

Washington

Revised Code of Washington (RCW), sections 35.63.270, 35A.63.290, 36.01.320, and 80.50.071 http://apps.leg.wa.gov/rcw/

Scope: State of Washington's siting certification process. Requires the State or an affected county or city to notify DoD of any application for an energy facility site certification proposing an energy plant, transmission line, or alternative renewable energy facility of at least one hundred fifteen thousand volts. DoD may comment upon the application before the cite certificate is approved.

Community Development Department - Planning Division

3900 Main Street, Riverside, CA 92522 (951) 826-5371 Fax: (951) 826-5981 www.Riversideca.gov

Senate Bill 1462 - Military Notification Process For Local Planning Proposals And Development Permit Applications

In 2004, the California State Senate passed Senate Bill 1462 that requires cities and counties to notify the United States Military of certain development projects.[1] The intention is to create a local notification process whereby the United States Military will be informed of certain local land use proposals in an effort to prevent land use conflicts between local communities and military installations and training activities (Please note: this process goes into effect November 11, 2005).

Your project is affected because of one of the following:

- Located within 1,000 feet of a military installation (March Air Reserve Base); or,
- Beneath a low-level flight path; or,
- Within special use airspace as defined in Section 21098 of the Public Resource Code.

See map attached to determine applicability. If you would like to check your site by address or parcel number please visit http://atlas.resources.ca.gov/ and click on California Military Land Use Compatibility Analyst to verify that it is within 1,000 feet of March Air Reserve Base.

APPLICATION SUBMITTAL: A complete and accurate application is needed to begin the review process for your project. If the application is incomplete or inaccurate, your project may be delayed until corrections or additions are received. When a complete application is accepted, a copy of the complete application will be sent to the four branches of the United States Armed Forces for their review as follows:

US Air Force
Regional Environmental Officer for California
Western Region Environmental Office
US Air Force
333 Market Street, Suite 625
San Francisco, CA 94105-2196
baha.zarah@brooks.af.mil

US Navy
Sheila Donovan
Community Plans and Liaison Coordinator
US Navy
1220 Pacific Highway
San Diego, CA 92132-5190
Sheila.Donovan@navy.mil

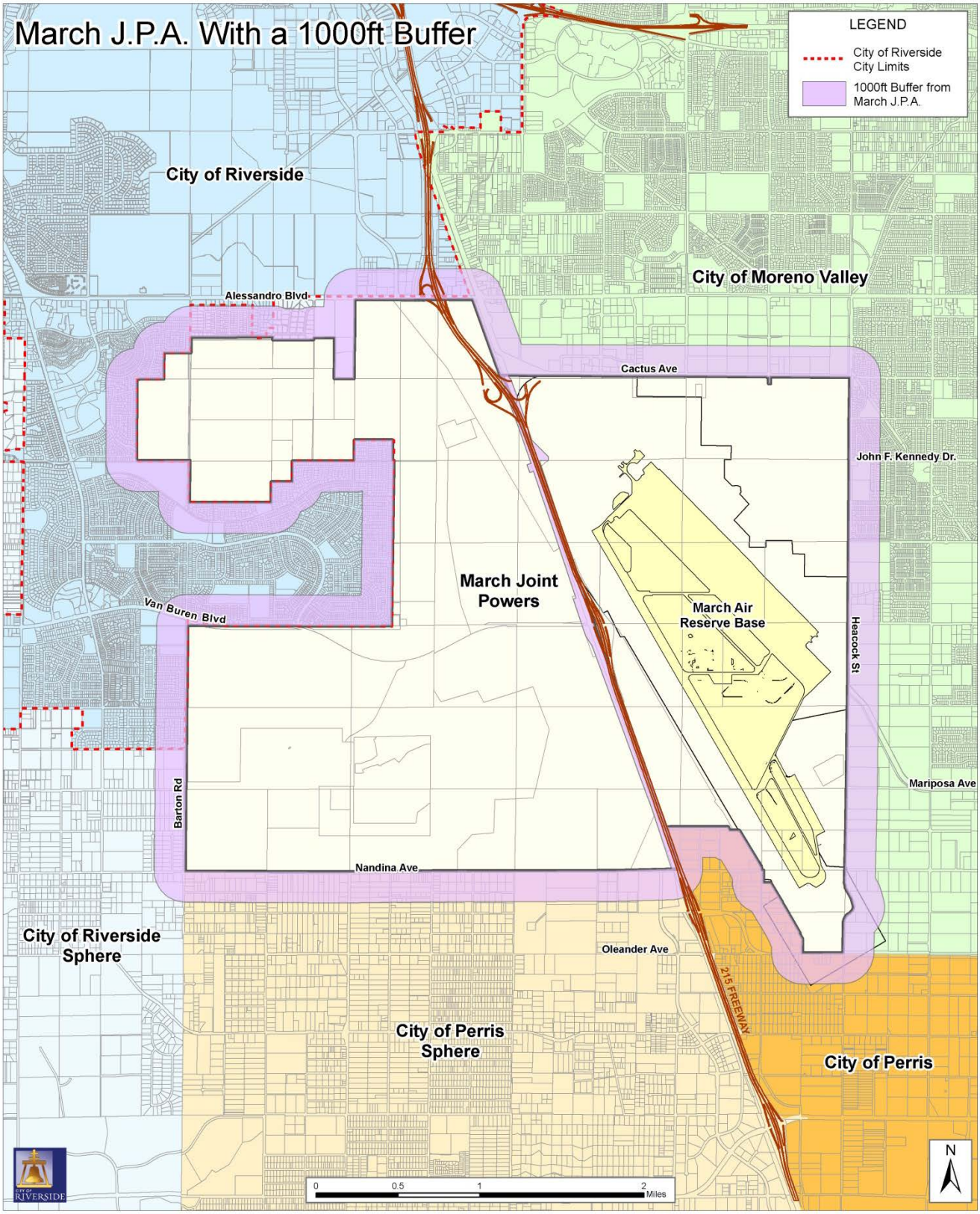
US Marine Corps
Patrick Christman, Director
Western Region Environmental Office
US Marine Corps
Building 1164, Box 555246
Camp Pendleton, CA 92055-5256
ChristmanP@pendleton.usmc.mil

US Army
Fort Irwin
Lt. Colonel Paul D. Cramer, Director
Public Works National Training Center
P.O. Box 105097 B790 5th Street
Fort Irwin, CA 92310
paul.cramer@irwin.army.mil

Fort Hunter-Liggett
Mr. Peter Rubin, Director
Public Works Combat Support Training Center
Parks RFTA, Dublin, CA 94568
peter.rubin@usar.army.mil

Upon receipt of a complete application, any branch of the United States Armed Forces has 45 days to request a consultation with the Planning Division and the applicant (you) to discuss the effects of the proposed project as well as potential alternatives and mitigation measures. **As such, compliance with this procedure may have the effect of extending the review process by more than 45 days.**

[1] For the purpose of this process, a "development project" is defined as – any project undertaken for the purpose of development. "Development project" includes a project involving the issuance of a permit for construction or reconstruction, but not a permit to operate. "Development project" does not include any ministerial projects proposed to be carried out or approved by public agencies. Government Code 65928.


March J.P.A. With a 1000ft Buffer
LEGEND
City of Riverside City Limits
1000ft Buffer from March J.P.A.
City of Riverside
City of Moreno Valley
Alessandro Blvd
Cactus Ave
John F. Kennedy Dr.
March Joint Powers
March Air Reserve Base
Van Buren Blvd
Heacock St
Barton Rd
Mariposa Ave
Nandina Ave
City of Riverside Sphere
Oleander Ave
215 FREEWAY
City of Perris Sphere
City of Perris
0 0.5 1 2 Miles
N

Technical Appendix H.

Model UAS Ordinance/Guidelines

DFW Region Unmanned Aircraft Ordinance

Unmanned aircraft are growing more popular for both hobbyists (and commercial users) and agencies interested in using their video capabilities for planning and rescue operations. No longer are these aircraft limited to military operations. The costs have come down, opening unmanned aircraft to a variety of new uses.

With these lower costs the opportunity for growth in governmental, recreational and commercial UAS usage is at an all-time high; according to the Federal Aviation Administration (FAA) Aerospace Forecast (2017-2037) by 2017, there were approximately 710,000 unmanned aircraft systems (UAS) registered in the US. The FAA predicts this number will grow to almost 4 Million by 2021. That represents a 462% growth rate, and with that many more aircraft in the skies this can pose a significant safety risk.

While this growth rate can have several positive effects such as creating new jobs, business opportunities and saving lives, it also has many potential negative effects. The biggest of these negative side effects is reckless users. In the Dallas-Fort Worth (DFW) region this risk is particularly highlighted when you consider the fact that the state of Texas has the 2nd most UAS registrations in the country (**See Figure 1**). And the region itself has the most registrants in the state at approximately 15,000 total registered users. Anticipating that the region's UAS ownership will grow at the same rate as the nation's that could mean almost 70,000 UAS registrations and 100,000 total (including non-registered UASs based on FAA's 35% non-registered metric).

Another consideration is the amount of reckless drone sightings reported in the region. From 2015 to 2016 the DFW region has had the 3rd most sightings in the country behind New York and Los Angeles at 82 total. That is almost twice as many sightings as Houston has seen during that same period (**See Figure 2**). Also when compared to the largest, "peer" regions in the country (Metropolitan Statistical Areas or MSAs), the DFW MSA has the 4th most sightings

(**See Figure 3**). If reckless UAS sightings are expected to have the same trend as UAS ownership those sightings could grow to almost 450 in 2021. Each one of these sightings represents the probability of an accident or catastrophic incident where the UAS could have crashed into a manned aircraft, building or person. These estimates are based off of those incidents that are actually reported, so the actual number could be higher.

Foreseeing this as a growth opportunity within the DFW region, the Air Transportation Advisory Committee (ATAC) began working to educate and collaborate with regional partners on strategies to manage this increase in demand. In 2014, ATAC held a UAS Workshop to educate members and interested parties. In April 2015, FAA released Notice of Proposed Rulemaking for Small UAS. Following this in October 2015, ATAC organized a UAS Subcommittee to discuss draft model ordinances and community impact. This effort was put on hold in early 2016 at the request of FAA awaiting the final rule. In June 2016, FAA released the final rule for small UAS. The ATAC UAS Subcommittee determined that additional coordination and collaboration was needed to ensure consistency across the DFW region. In January 2017, the ATAC UAS Subcommittee reconvened to begin drafting a UAS model ordinance for regional partners to consider that focuses on take-off and landings of recreational users, an area not covered by the FAA's final rule. In May 2017 the Texas Legislature passed a bill that limits the ability of local governments in the state from approving or enforcing ordinances regulating UAS operations. Under this bill, FAA will be required to approve local ordinances. The ATAC UAS Subcommittee will be seeking more information from FAA on implementation. A sequence of events and critical dates of these efforts are documented in **Attachment 1**.

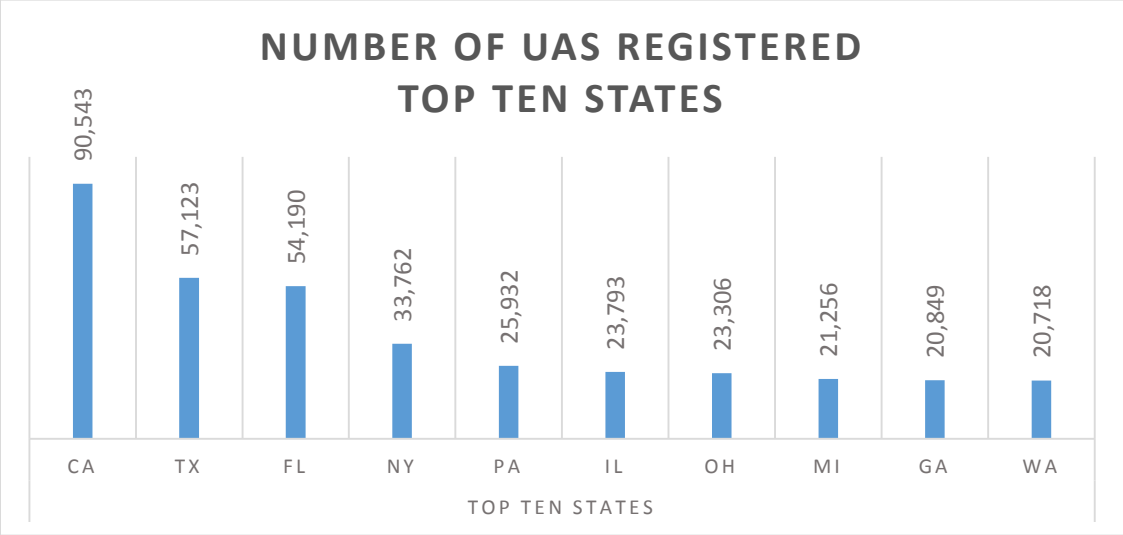
North Central Texas has approximately 400 aviation facilities within the approximately 15,700 square-mile area that encompasses over 200 municipalities. Of the 400 aviation facilities, 35 are general aviation airports, two are commercial airports, more than 140 are registered heliports, as well as military and private aviation facilities. Within a five mile radius of commercial, military and general aviation airports within the DFW region 109 are municipalities impacted. Due to the large number of aviation facility partners, coordination and consistency

for UAS modal ordinances is critical to provide seamless direction to UAS operators in our region. A map and table showing the five mile radius of the commercial, military and GA airports is provided in **Attachment 2** and **Attachment 3**.

With Amazon having approximately five fulfillment centers in the DFW region and wanting to use UASs for delivery services, soon the region's airspace could be filled with that new traffic. Also, with the endless business opportunities with UASs the current projections for our region will likely be outdone. Additionally, like 40 local governments around the country that have already approved ordinances to regulate UASs, the DFW region needs to be prepared. An example from Los Angeles, California is provided in **Attachment 4**.

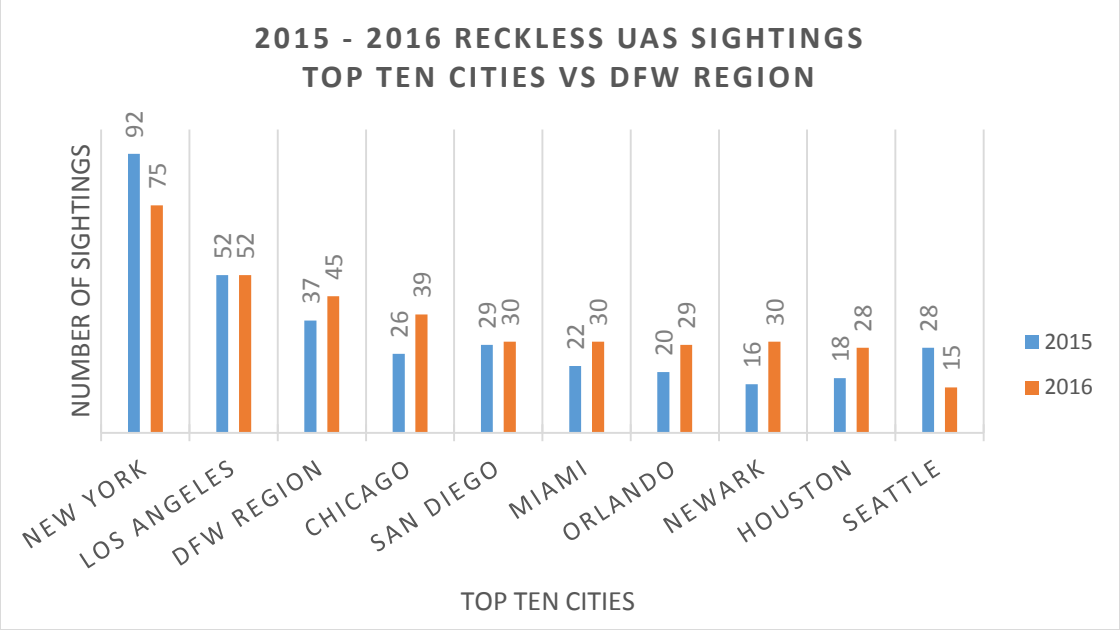
The cumulative potential impacts discussed in this report have led NCTCOG, along with various regional stakeholders, to start the process of creating a draft ordinance on UAS usage that will give law enforcement authority to intervene when a UAS user is operating recklessly. We anticipate that this ordinance will be complete by the summer and, if accepted regionally and allowed under new state legislation, will help keep our skies safe and also ensure that businesses can use UAS technology with minimal hindrances. The current draft model ordinance is provided in **Attachment 5**.

Figure 1 - Number of UAS Registered (Top Ten States)



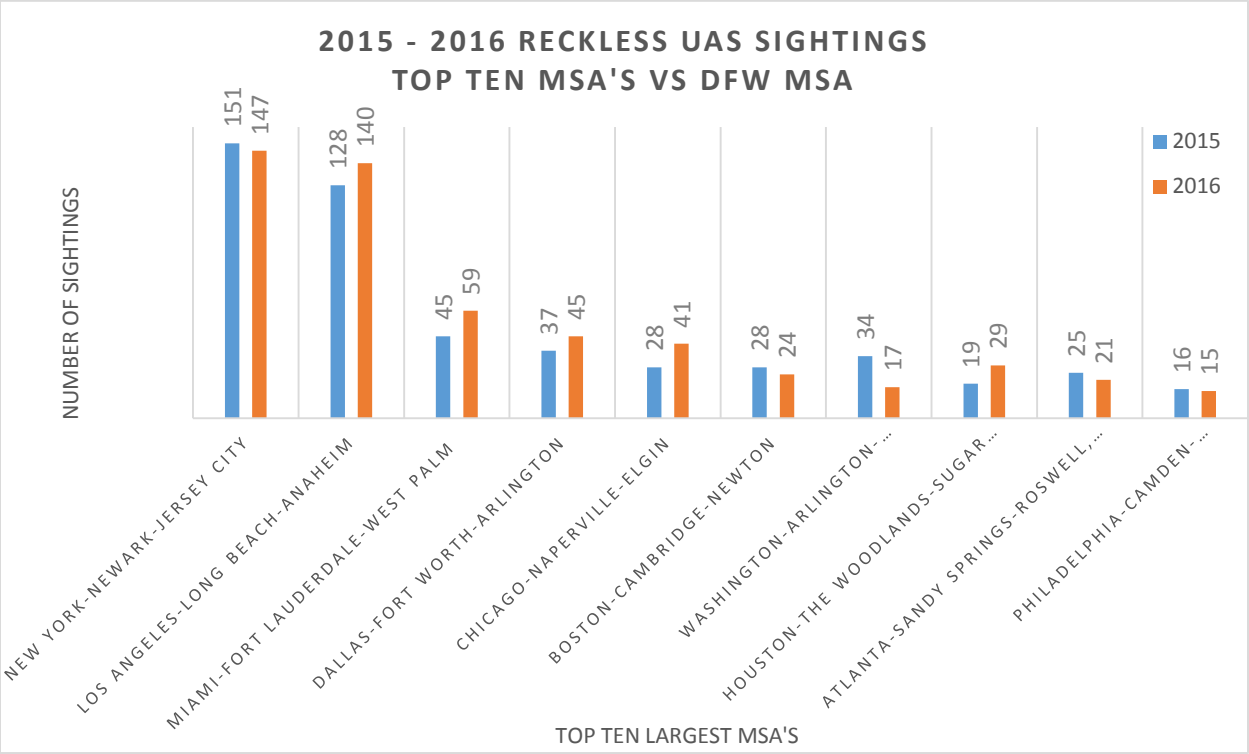
Source: Federal Aviation Administration - "Geographic (City, State, Zip) Listing of sUAS Registry Enrollments and Registrants (as of 2/3/2017)

Figure 2 - Number of Reckless UAS Sightings (Cities)



Source: Federal Aviation Administration – UAS Sightings Reports November 2014 – September 2016

Figure 3- Number of Reckless UAS Sightings (MSA's)



Attachment 1

UNMANNED AIRCRAFT SYSTEMS
IMPORTANT DATES

February 2012, NCTCOG published Unmanned Aircraft System Report as part of the North Central Texas Regional General Aviation and Heliport System Plan. Available online at www.nctcog.org/trans/aviation/documents/Unmanned_Aircraft_Systems_Report_2_25_15_Update.pdf

October 2014, Air Transportation Technical Advisory Committee (ATTAC) held an Unmanned Aircraft System (UAS) Workshop for ATTAC members.

February 2015, Federal Aviation Administration (FAA) release Notice of Proposed Rulemaking (NPR) for Small UAS.

April 2015, ATTAC held an UAS Workshop open for anyone to attend. Information available online at www.nctcog.org/trans/aviation/uas.asp

April 2015, ATTAC approved "Unmanned Aircraft – Policy, Ordinance, and Local Integration Preliminary Report". Available online at www.nctcog.org/trans/aviation/uas.asp

April 2015, ATTAC submitted comments regarding FAA NPR for Small UAS.

August 2015, NCTCOG release Fact Sheet on UAS.

September 2015, the following UAS legislation from the 84th Texas Legislature went into effect.

HB 1481 (Murphy) Relating to prohibiting the operation of an unmanned aircraft over certain facilities; creating a criminal offense.

HB 1481 creates an offense to operate an unmanned aircraft over critical infrastructure facilities if the facility is completely enclosed with a fence or barrier, or with a sign indicating that entry is forbidden, or an aboveground oil, gas, or chemical pipeline that is enclosed by a fence that is obviously designed to exclude intruders.

The offense under is a Class B misdemeanor, unless a person has been previously convicted, then it is a Class A misdemeanor.

The bill takes effect September 1, 2015.

HB 2167 (Smith) Relating to certain images captured by an unmanned aircraft.

HB 2167 extends the lawful purposes of capturing an image using an unmanned aircraft to include professional surveying or engineering. An image captured by a registered professional land surveyor in connection with the practice of professional surveying or an image captured by a professional engineer in connection with the practice of engineering has been added to the list of lawful purposes of capturing an image using an unmanned aircraft, provided that no individual is identifiable in the image.

This bill takes effect September 1, 2015.

HB 3628 (Geren) Relating to the adoption by the Department of Public Safety of rules governing the use of unmanned aircraft in the Capitol Complex; creating a criminal offense.

HB 3628 requires the director of the DPS to adopt rules governing the use of unmanned aircraft in the Capitol Complex. The rules may prohibit or authorize limited use of unmanned aircraft in the Capitol Complex. This offense is a Class C misdemeanor or a Class B misdemeanor if a previous offense has been committed. The director shall adopt the new rules no later than December 1, 2015.

The bill takes effect September 1, 2015.

September 2015, FAA Advisory Circular #91-57A was released to provide guidance to persons operating UAS for hobby or recreation purposes.

ATAC Organized UAS Subcommittee – October 2015

October 14, 2015 first UAS Subcommittee meeting discussed draft ordinance and communities impacted.

October 19, 2015 Press Release on US Transportation Secretary Anthony Foxx Announces Unmanned Aircraft Registration Requirement.

November 4, 2015 second UAS Subcommittee meeting discussed draft ordinance and FAA participated.

December 17, 2015 – FAA issues fact sheet on state and local laws.

December 21, 2015, anyone who owns a small unmanned aircraft of a certain weight must register with the Federal Aviation Administration's Unmanned Aircraft System (UAS) registry before they fly outdoors. People who previously operated their UAS must register by February 19, 2016." *Source*: *FAA* Unmanned Aircraft Systems Registration

January 4, 2016 meet with FAA at FAA headquarters to discuss UAS ordinance (see notes)

January 6, 2016 - FAA Releases B4UFLY Smartphone App Current and upcoming requirements and restrictions for operation of UAS in the National Airspace System.

January 7, 2016 updated ATAC on status and next steps.

February 4, 2016 third UAS Subcommittee meeting to discuss draft ordinance and possible technology to detect UAS.

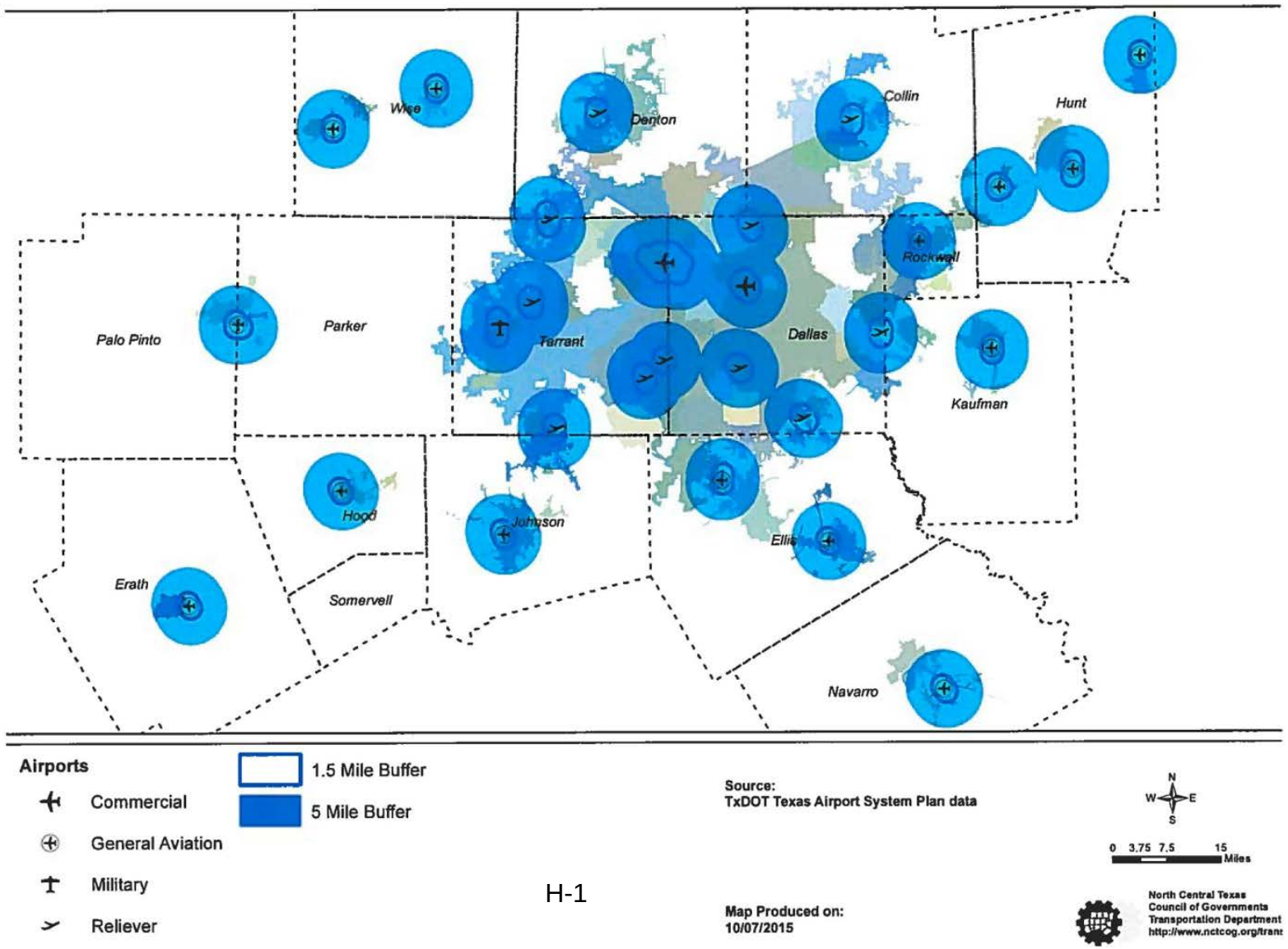
January 25, 2017 new UAS Subcommittee meets for the first time to discuss the creation of a new draft ordinance in response to Part 107's release.

February 27, 2017 UAS Subcommittee meets for the second time to discuss statewide UAS ordinance efforts and preferred ordinance elements.

March 27, 2017 UAS Subcommittee meets for the third time to discuss regional UAS sightings and reviewing new draft ordinance.

Attachment 2

One and a Half Mile plus Five Mile Buffers of Commercial, Military, Reliever, and General Aviation Airports



Attachment 3

Airports within 1.5 and 5 miles of Runways in NCTCOG 16 Counties

NAME	APT_ID	Class	CITY	1.5 Miles	5 Miles	In City Limits	Has Airport
Addison	ADS	Reliever	Farmers Branch	x	x		
			Carrollton	x	x		
			Richardson		x		
			The Colony		x		
			Dallas	x	x		x
			Plano		x		
			Addison	x	x	x	x
			Hebron		x		
Arlington Municipal	GKY	Reliever	Grand Prairie		x		x
			Dalworthington Gardens		x		
			Arlington	x	x	x	x
			Mansfield		x		
			Pantego		x		
Bridgeport Municipal	XBP	General Aviation	Runaway Bay	x	x		
			Bridgeport	x	x	x	x
			Lake Bridgeport	x	x		
C David Campbell Field-Corsicana Municipal	CRS	General Aviation	Corsicana	x	x	x	x
			Eureka		x		
			Angus	x	x		
			Retreat		x		
			Navarro	x	x		
			Mildred		x		
			Mustang	x	x		
Caddo Mills Municipal	7F3	General Aviation	Josephine		x		
			Royse City		x		
			Caddo Mills	x	x	x	x
Clark Field Municipal	SEP	General Aviation	Stephenville	x	x		
Cleburne Municipal	CPT	General Aviation	Cleburne	x	x	x	x
			Keene		x		
Collin County Regional at McKinney	TKI	Reliever	McKinney	x	x	x	x
			Allen		x		
			Melissa		x		
			Lucas		x		
			Lowry Crossing	x	x		
			Princeton		x		
			Fairview	x	x		
			New Hope	x	x		
Commerce Municipal	2F7	General Aviation	Commerce	x	x	x	x
Dallas Executive (Redbird)	RBD	Reliever	Cedar Hill		x		
			Grand Prairie		x		x
			Dallas	x	x	x	x
			DeSoto		x		
			Cockrell Hill		x		
			Duncanville	x	x		
			Lancaster		x		x

Airports within 1.5 and 5 miles of Runways in NCTCOG 16 Counties

NAME	APT_ID	Class	CITY	1.5 Miles	5 Miles	In City Limits	Has Airport
Dallas Love Field	DAL	Commercial	Farmers Branch		x		
			Irving	x	x		
			Dallas	x	x	x	x
			University Park	x	x		
			Highland Park	x	x		
Dallas/Fort Worth International	DFW	Commercial	Farmers Branch		x		
			Carrollton		x		
			Grand Prairie		x		x
			Bedford		x		
			Irving	x	x	x	x
			Fort Worth		x		x
			Arlington		x		x
			Lewisville		x		
			Coppell		x		
			Dallas		x		x
			Colleyville		x		
			Southlake		x		
			Euless	x	x	x	x
			Grapevine	x	x	x	x
			Flower Mound		x		
Decatur Municipal	LUD	General Aviation	Decatur	x	x	x	x
Denton Municipal	DTO	Reliever	Denton	x	x	x	x
			Krum		x		
			Argyle		x		
			Northlake		x		
			Ponder		x		
Ennis Municipal	F41	General Aviation	Bardwell	x	x		
	F41		Ennis		x		
	F41		Garrett	x	x		
	F41		Palmer		x		
Fort Worth Alliance	AFW	Reliever	Haslet	x	x	x	x
			Fort Worth	x	x	x	x
			Justin		x		
			Roanoke		x		
			Keller		x		
			Northlake		x		
			Westlake		x		
Fort Worth Meacham International	FTW	Reliever	Blue Mound		x		
			Haltom City		x		
			Saginaw	x	x		
			Fort Worth	x	x	x	x
			Lake Worth		x		
			Sansom Park	x	x		
			Westworth Village		x		
			River Oaks		x		

Airports within 1.5 and 5 miles of Runways in NCTCOG 16 Counties

NAME	APT_ID	Class	CITY	1.5 Miles	5 Miles	In City Limits	Has Airport
Fort Worth Spinks	FWS	Reliever	Briaroaks		x		
			Crowley	x	x		
			Fort Worth	x	x	x	x
			Burleson	x	x		
			Everman		x		
			Cross Timber		x		
Granbury Municipal	GDJ	General Aviation	Brazos Bend		x		
			Granbury	x	x		
Grand Prairie Municipal	GPM	Reliever	Grand Prairie	x	x	x	x
			Arlington	x	x		x
			Dallas		x		x
Lancaster	LNC	Reliever	Red Oak		x		
			Ferris		x		
			Dallas		x		x
			Lancaster	x	x	x	x
			Hutchins		x		
			Wilmer	x	x		
Majors	GVT	General Aviation	Greenville	x	x	x	x
Mesquite Metro	HQZ	Reliever	Balch Springs		x		
			Seagoville		x		
			Forney		x		
			Mesquite	x	x	x	x
			Dallas		x		x
			Heath		x		
			Sunnyvale	x	x		
Mid-Way	JWY	General Aviation	Red Oak		x		
			Oak Leaf		x		
			Glenn Heights		x		
			Ovilla		x		
			Waxahachie	x	x		
			Midlothian	x	x	x	x
Mineral Wells	MWL	General Aviation	Mineral Wells	x	x	x	x
			Cool		x		
			Millsap		x		
NAS Fort Worth Joint Reserve Base	NFW	Military	Benbrook		x		
			Fort Worth	x	x	x	x
			Lake Worth	x	x		
			Sansom Park		x		
			Westworth Village	x	x	x	x
			White Settlement	x	x	x	x
			River Oaks		x		
			Lakeside		x		
			Westover Hills	x	x		

Airports within 1.5 and 5 miles of Runways in NCTCOG 16 Counties

NAME	APT_ID	Class	CITY	1.5 Miles	5 Miles	In City Limits	Has Airport
Rockwall Municipal	F46	General Aviation	Mobile City	x	x		
			Rowlett		x		
			Fate	x	x		
			McLendon-Chisholm		x		
			Royse City		x		
			Rockwall	x	x	x	x
			Dallas		x		x
			Heath		x		
			Wylie		x		
Terrell Municipal	TRL	General Aviation	Terrell	x	x	x	x
			Post Oak Bend City		x		
			Oak Ridge	x	x		

Attachment 4

ORDINANCE NO. 183912

An ordinance adding Section 56.31 to Article 6 of Chapter V of the Los Angeles Municipal Code to impose community-based safety requirements on the operation of Model Aircraft and to impose restrictions consistent with certain Federal Aviation Rules on the operation of both Model Aircraft and Civil Unmanned Aircraft Systems (UASs), commonly known as drones.

WHEREAS, the operation of Unmanned Aircraft such as Model Aircraft and Civil UASs can at times pose a hazard to full-scale aircraft in flight and to persons and property on the ground; and

WHEREAS, imposing community-based safety requirements on the operation of Model Aircraft and imposing restrictions on the operation of both Model Aircraft and Civil UASs consistent with Federal Aviation Rules is necessary to mitigate such risks and to protect the public from the hazards associated with the operation of Unmanned Aircraft.

NOW, THEREFORE,

THE PEOPLE OF THE CITY OF LOS ANGELES DO ORDAIN AS FOLLOWS:

Section 1. A new Section 56.31 is added to Article 6 of Chapter V of the Los Angeles Municipal Code to read as follows:

SEC. 56.31. UNMANNED AIRCRAFT SYSTEMS.

(a) For purposes of this section:

1. "**Unmanned Aircraft**" shall mean an aircraft, including, but not limited to, an aircraft commonly known as a drone, that is operated without the possibility of direct human intervention from within or on the aircraft.

2. "**Unmanned Aircraft System**" shall mean an Unmanned Aircraft and associated elements, including, but not limited to, any communication links and components that control the Unmanned Aircraft.

3. "**Person**" shall have the same meaning as set forth in Subsection (a) of Section 11.01 of this Code.

4. "**Model Aircraft**" shall mean an Unmanned Aircraft or Unmanned Aircraft System operated by any Person strictly for hobby or recreational purposes.

5. "**Civil UAS**" shall mean an Unmanned Aircraft or Unmanned Aircraft System operated by any Person for any purposes other than strictly

hobby or recreational purposes, including, but not limited to, commercial purposes or in furtherance of, or incidental to, any business or media service or agency.

6. "**Public UAS**" shall mean an Unmanned Aircraft or Unmanned Aircraft System operated by any public agency for government related purposes.

(b) The following shall apply to the operation of any Model Aircraft within the City of Los Angeles:

1. No Person shall operate any Model Aircraft within the City of Los Angeles and within 5 miles of an airport without the prior express authorization of the airport air traffic control tower.

2. No Person shall operate any Model Aircraft within the City of Los Angeles in a manner that interferes with manned aircraft, and shall always give way to any manned aircraft.

3. No Person shall operate any Model Aircraft within the City of Los Angeles beyond the visual line of sight of the person operating the Model Aircraft. The operator must use his or her own natural vision (which includes vision corrected by standard eyeglasses or contact lenses) to observe the Model Aircraft. People other than the operator may not be used in lieu of the operator for maintaining visual line of sight. Visual line of sight means that the operator has an unobstructed view of the Model Aircraft. The use of vision-enhancing devices, such as binoculars, night vision goggles, powered vision magnifying devices, and goggles or other devices designed to provide a "first-person view" from the model, do not constitute the visual line of sight of the person operating the Model Aircraft.

4. No Person shall operate any Model Aircraft within the City of Los Angeles other than during daylight hours defined as between official sunrise and official sunset for local time.

5. No Person shall operate any Model Aircraft within the City of Los Angeles more than 400 feet above the earth's surface.

6. Excluding takeoff and landing, no Person shall operate any Model Aircraft within the City of Los Angeles closer than 25 feet to any individual, except the operator or the operator's helper(s).

(c) The following shall apply to the operation of any Model Aircraft or Civil UAS within the City of Los Angeles:

1. No Person shall operate any Model Aircraft or Civil UAS within the City of Los Angeles in a manner that is prohibited by any federal statute or regulation governing aeronautics.

2. No Person shall operate any Model Aircraft or Civil UAS within the City of Los Angeles in violation of any temporary flight restriction (TFR) or notice to airmen (NOTAM) issued by the Federal Aviation Administration.

3. No Person shall operate any Model Aircraft or Civil UAS within the City of Los Angeles in a careless or reckless manner so as to endanger the life or property of another. The standard for what constitutes careless and reckless operation under this section shall be the same as the standard set forth in any federal statutes or regulations governing aeronautics including but not limited to Federal Aviation Rule 91.13.

(d) It shall be unlawful for any Person to violate or fail to comply with this section. Any Person violating the provisions of this section shall be guilty of a misdemeanor and subject to the provisions of Subsection (m) of Section 11.00 of this Code.

(e) This section shall not apply to any Public UAS operated pursuant to, and in compliance with, the terms and conditions of any current and enforceable authorization granted by the Federal Aviation Administration.

Sec. 2. The City Clerk shall certify to the passage of this ordinance and have it published in accordance with Council policy, either in a daily newspaper circulated in the City of Los Angeles or by posting for ten days in three public places in the City of Los Angeles: one copy on the bulletin board located at the Main Street entrance to the Los Angeles City Hall; one copy on the bulletin board located at the Main Street entrance to the Los Angeles City Hall East; and one copy on the bulletin board located at the Temple Street entrance to the Los Angeles County Hall of Records.

I hereby certify that this ordinance was passed by the Council of the City of Los Angeles, at its meeting of OCT 14 2015.

HOLLY L. WOLCOTT, City Clerk

By _____
Deputy

Approved 10/22/15

_____
Mayor

Approved as to Form and Legality

MICHAEL N. FEUER, City Attorney

By _____
for JANET KARKANEN
Deputy City Attorney

Date SEP 16 2015

File No. 15-0927

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DECLARATION OF POSTING ORDINANCE

I, VERONICA COLEMAN-WARNER, state as follows: I am, and was at all times hereinafter mentioned, a resident of the State of California, over the age of eighteen years, and a Deputy City Clerk of the City of Los Angeles, California.

Ordinance No.183912 – Adding Section 56.31 to Article 6 of Chapter V of the Los Angeles Municipal Code to impose community-based safety requirements on the operation of Model Aircraft and to impose restrictions consistent with certain Federal Aviation Rules on the operation of both Model Aircraft and Civil Unmanned Aircraft Systems, commonly known as drones - a copy of which is hereto attached, was finally adopted by the Los Angeles City Council on **October 14, 2015**, and under the direction of said City Council and the City Clerk, pursuant to Section 251 of the Charter of the City of Los Angeles and Ordinance No. 172959, on **October 23, 2015** I posted a true copy of said ordinance at each of the three public places located in the City of Los Angeles, California, as follows: 1) one copy on the bulletin board located at the Main Street entrance to the Los Angeles City Hall; 2) one copy on the bulletin board located at the Main Street entrance to the Los Angeles City Hall East; 3) one copy on the bulletin board located at the Temple Street entrance to the Los Angeles County Hall of Records.

Copies of said ordinance were posted conspicuously beginning on **October 23, 2015** and will be continuously posted for ten or more days.

I declare under penalty of perjury that the foregoing is true and correct.

Signed this **23rd** day of **October, 2015** at Los Angeles, California.

Veronica Coleman-Warner

Veronica Coleman-Warner, Deputy City Clerk

Ordinance Effective Date: **December 2, 2015** **Council File No. 15-0927**

Attachment 5

ORDINANCE NO. [Number of Ordinance]

AN ORDINANCE AMENDING THE [NAME] ORDINANCE OF THE [CITY NAME], BEING ORDINANCE NO. [NUMBER], AS AMENDED, CODIFIED AS [SECTION/AREA OF CITY CODE] OF THE [CITY NAME], PROVIDING REGULATIONS FOR USE OF UNMANNED AIRCRAFT; PROVIDING THAT THIS ORDINANCE SHALL BE CUMULATIVE; PROVIDING A SEVERABILITY CLAUSE; PROVIDING A PENALTY CLAUSE; PROVIDING A SAVINGS CLAUSE; PROVIDING FOR PUBLICATION IN THE OFFICIAL NEWSPAPER; AND PROVIDING AN EFFECTIVE DATE.

WHEREAS, the [Airport(s)/Heliport(s) Names] are major economic generators and fulfill an essential community purpose; and

WHEREAS, the [Military Installation Name – if applicable] serves a vital role in the economy of the City of [City Name] and the region as well as in the defense of the Nation; and

WHEREAS, the creation or establishment of land uses or airport hazards that are not compatible with the operations of an airfield is a public nuisance, injures the region served by the airports, and affects the welfare of users of the airports and of owners, occupants, and users of land in the vicinity of the airports; and

WHEREAS, these nuisances may include any use, activity or structure that may be a hazard to the taking off, landing, and maneuvering of aircraft or that interferes with visual radar, radio, or other systems for tracking, acquiring data relating to, monitoring or controlling aircraft be prevented; or that may be sensitive to the noise level and vibrations that are typical in the

vicinity of an operative airfield, tending to destroy or impair the utility of the airport and the public investment in the airports; and

WHEREAS, it is necessary in the interest of the health, safety, and welfare of the general public, as well as the economic stability of the region that the creation or establishment of incompatible land uses and airport hazards be prevented; and

WHEREAS, it is necessary in the interest of predictable growth and development of land in the vicinity of the airports, the long term integrity of the airports' usage and operations,

NOW, THEREFORE, BE IT ORDAINED BY THE CITY COUNCIL OF THE [CITY NAME], Texas :

SECTION 1.

Section X.XXX.X. " [Name of Applicable City Standard and Guidelines], of Article X, of Chapter X is amended to add recommended policy for the use of small unmanned aircraft, commonly referred to as drones:

It shall be unlawful for any Pilot in Command (PIC) to use a small Unmanned Aircraft System (sUAS) for any civil or recreational aircraft operation within five (5) miles of any public, private or military airport without written permission of the airport issued to the PIC by the airport's authorized representative.

It shall further be unlawful for any PIC to use a sUAS for any civil aircraft operation unless the flight is permitted under the applicable Federal Aviation Administration (FAA) rules for the operation and maintenance of sUAS activity within 5 miles of an airport, or the flight is authorized and permitted pursuant to a Special Airworthiness Certificate.

The following requirements must be met to be eligible to receive permission to operate a sUAS within the 5 mile distance buffer prohibited above:

a. No sUAS shall be operated within 1.5 miles from any point of the centerline of any runway or an airport or heliport property line.
b. No sUAS shall be operated in any manner while equipped with a weapon of any kind.
c. No person shall capture or store any image using an unmanned aircraft in violation of Texas Government Code Chapter 423, as amended.
d. Insurance shall be required for all civil operations within five (5) miles of any airport. Proof of insurance shall be provided upon request by law enforcement and/or any authorized airport personnel.
    1. Minimum coverage limits for the civil operation of sUAS are as follows:
        i. $2,500,000 Comprehensive General Liability Protection
        ii. $25,000 Accident/Medical Coverage
e. Functional Global Positioning System (GPS), altitude indicator, and GPS track recorder must be installed on each sUAS prior to any civil operation. Flight track data shall be provided to any airport upon written request provided that any portion of the sUAS's operation occurred within five (5) miles of such airport and the request is made in writing to the PIC within thirty (30) days following completion of the flight.
f. Unless otherwise exempted by law, a Notice to Airman (NOTAM) must be filed before any civil UAS operation.
g. Prior to their use within 5 miles, the noise footprint, or controlled airspace, whichever is greater, for any military installation with flight operations requires correspondence with the Operations Officer and/or Community Planning Liaison Officer of the installation Commanding Officer's staff.

h. All sUAS shall be registered in accordance with FAA policy and guidance prior to operation. Proof of FAA registration shall be provided by the PIC of any sUAS upon request by law enforcement.

i. UAS operated for public uses shall be exempt from the regulations set forth in this Ordinance provided that such public uses are authorized by and/or otherwise comply with all FAA Certificate of Authorization (COA) requirements applicable to such public uses. The exemption provided in this Section 1(i) shall be subject to notice and approval of the authorized representative of any airport within five (5) miles of the pubic UAS use.

SECTION 2.

Operations authorized by the FAA – Exception

Notwithstanding the prohibitions set forth in the previous section, nothing in this Ordinance shall be construed to prohibit, limit, or otherwise restrict any person who is authorized by the Federal Aviation Administration to operate a small unmanned aircraft in city air space, pursuant to Section 333 of the FAA Modernization and Reform Act of 2012 or a certificate of waiver, certificate of authorization or airworthiness certificate under Section 44704 of Title 49 of the United States Code or other Federal Aviation Administration grant of authority for a specific flight operation(s), from conducting such operation(s) in accordance with the authority granted by the Federal Aviation Administration.

Operations prohibited by the FAA – Clarification

Nothing in this Ordinance shall be construed to authorize the operation of any small unmanned aircraft in city airspace in violation of any Federal statute or rules promulgated thereunder, including but not limited to, any temporary flight restrictions or notices to airmen issued by the Federal Aviation Administration.

SECTION 3.

This ordinance shall be cumulative of all provisions of ordinances and of the Code of the [City Name], as amended, except where the provisions of this ordinance are in direct conflict with the provisions of such ordinances and such Code, in which event conflicting provisions of such ordinances and such Code are hereby repealed.

SECTION 4.

It is hereby declared to be the intention of the City Council that the sections, paragraphs, sentences, clauses and phrases of this ordinance are severable, and, if any phrase, clause, sentence, paragraph or section of this ordinance shall be declared unconstitutional by the valid judgment or decree of any court of competent jurisdiction, such unconstitutionality shall not affect any of the remaining phrases, clauses, sentences, paragraphs and sections of this ordinance, since the same would have been enacted by the City Council without the incorporation in this ordinance of any such unconstitutional phrase, clause, sentence, paragraph or section.

SECTION 5.

Any person, who shall violate a provision of this Article, or fail to comply therewith, or with any of the requirements thereof, shall be prosecuted within the limits provided by law and, upon conviction, shall be punished by a fine not to exceed Five Hundred Dollars ($500.00) for each offense. Each day that a violation continues shall constitute a separate offense.

Nothing in this Ordinance shall prohibit the City, State or Federal government from enforcing any administrative, civil and/or criminal enforcement remedies concurrently or availing itself of any other remedy allowed by law in connection with the administration or enforcement of this Ordinance.

SECTION 6.

All rights and remedies of the [City Name] are expressly saved as to any and all violations of the provisions of [Ordinance Numbers] and any other ordinances affecting zoning which have accrued at the time of the effective date of this ordinance, and, as to such accrued violations and all pending litigation, both civil and criminal, whether pending in court or not, under such ordinances, same shall not be affected by this ordinance but may be prosecuted until final disposition by the courts.

SECTION 7.

The City Secretary of the [City Name] is hereby directed to publish the caption, penalty clause and effective date of this ordinance for two (2) days in the official newspaper of the [City Name] as authorized by Section 52. 013, Texas Local Government Code.

SECTION 8.

All other provisions of the [Name] Ordinance of the [City Name] not herein amended shall remain in full force and effect.

SECTION 9.

This ordinance shall take effect upon adoption and publication as required by law.

Terms as defined by the FAA or the State of Texas:

1. Aircraft: any contrivance invented, used, or designed to navigate, or fly, in the air (Title 49, United States Code (49 USC) § 40102)
2. Pilot in Command (PIC): the person who has final authority and responsibility for the operation and safety of the flight; has been designated as PIC before or during the flight;

and holds the appropriate category class and type-rating, if appropriate, for the conduct of the flight (14 CFR § 1.1)

3. Unmanned aircraft (UA): any aircraft that is operated without the possibility of direct human intervention from within or on the aircraft (P.L. 112-95, Section 331)
4. Unmanned Aircraft System (UAS): an unmanned aircraft and associated elements, including communication links and the components that control the unmanned aircraft, that are required for the pilot in command to operate safely and efficiently in the national airspace system (P.L. 112-95, Section 331)
5. UAS Certificate of Waiver or Authorization (COA): an authorization issued by the Air Traffic Organization to an operator for a specific unmanned aircraft activity
6. Image: any capturing of pictures, video, sound waves, thermal, infrared, ultraviolet, visible light, or other electromagnetic waves, odor, or other conditions existing on or about real property in this state or an individual located on that property.
7. Public Operations: Limited by federal statue to certain government operations within U.S. airspace. Title 49 U.S.C. § 40102(a)(41) provides the definition of "Public Aircraft" and § 40125 provides the qualifications for public aircraft status. Whether an operation qualifies as a public aircraft operation is determined on a flight-by-flight basis, under the terms of the statute. The considerations when making this determination are aircraft ownership, the operator, the purpose of the flight, and the persons on board the aircraft.
8. Civil Operations: Non-Governmental including, but not limited to, commercial purposes or in furtherance of, or incidental to, any business or media service or agency.
9. Model Aircraft: Aircraft used for Hobby or Recreation operations only.
10. Weapons: something used to injure, defect or destroy.
11. Malice: Per Section 41.001 of the Texas Civil Practice and Remedies Code, a specific intent by the defendant to cause substantial injury or harm to the claimant.

Technical Appendix I.

Model Military Overlay Zone Ordinance

City of Fort Worth Airport/Airfield ("AO") Overlay District

§ 4.405 AIRPORT/AIRFIELD ("AO") OVERLAY DISTRICT.

(a) *Purpose and intent.* The purpose of the airport/airfield overlay district is the regulation of land uses in the vicinity of the city's airports and airfields and to ensure the protection of the airports where it has been determined that they are an essential economic element of the city and surrounding cities. It is also the purpose of this section to protect the health, safety and general welfare of the public where it is recognized that aircraft accidents and excessive noise have the potential for endangering or harming the lives and or property of users or occupants of land in the vicinity of the airports that serve Fort Worth.

(b) *Generally.*

(1) *Applicability.*

a. Airport zoning regulations shall apply to all of the incorporated areas of the City of Fort Worth which are located within an accident potential zone or clear zone as described herein. The use of all land and any buildings or structures located upon the land, and the height, construction, reconstruction, alteration, expansion or relocation of any building or structure upon the land shall conform to all regulations applicable to this section. No land, building, structure or premises shall be constructed and/or used for any purpose or in any manner other than is permitted in this section.

b. The airport zoning regulation shall also be in accordance with prescribed regulations contained in V.T.C.A. Local Government Code §§ 241.001 et seq.

(2) *Electrical interference.* Notwithstanding any other provisions of this section, no use shall be made of land or water nor institution within an airport/airfield overlay district in such a

manner as to create electrical interference with navigational signals or radio communications between the airport and aircraft, make it difficult for pilots to distinguish between airport lights and others, impair visibility in the vicinity of the airport, create bird strike hazards or otherwise endanger or interfere with the landing, takeoff or maneuvering of aircraft utilizing the City of Fort Worth airports or the Naval Air Station Fort Worth Joint Reserve Base (NAS FW JRB).

(3) *Maps.* Maps identifying the boundaries of the airport/airfield overlay district for the applicable airports and further described by each applicable airport subsection are hereby incorporated into the city's official zoning map.

(4) *Zoning classification.*

a. *Airport/airfield overlay district.* The airport/airfield overlay district is designed as an overlay to the base zoning district. Property located within this zoning overlay must also be designated as being within one of the base zoning districts. Permitted uses must be allowed in both the base zoning district and the overlay district and must comply with height, yard, area and parking requirements of the base zoning district.

b. *Zoning designation.* The zoning designation of the property located within the airport/airfield overlay district shall consist of the base zoning symbol and the overlay symbol as a suffix. For example, if a parcel is zoned "A-5" and is also located in the airport/airfield overlay district, the zoning of the parcel would be "A-5/AO." The zoning designation of parcels located within a compatible use zone shall consist of the base zoning symbol and the following as a suffix: "AO-CUZ."

(5) *Height considerations.*

a. 14 C.F.R. Part 77, Subpart C establishes the following imaginary surfaces for airports: approach surface; conical surface; horizontal surface; primary surface; and transitional surface as defined in the applicable airport layout plan.

1. Structures cannot penetrate Federal Aviation Regulation Part 77 imaginary surfaces and elevation at the site of construction.

2. Construction or alteration requiring notice: any person proposing construction or alteration whether permanent, temporary or of natural growth in the area surrounding any municipal or military airport shall notify the manager, Air Traffic Division of the Federal Aviation Administration (FAA) Regional Office and the manager of the municipal airport or community liaison or other appointee of the NAS FW JRB, as applicable, if such construction or alteration exceeds any of the following height standards.

i. The height limits are defined in terms of imaginary surfaces in the airspace extending about two to three miles around airport runways and approximately nine and one-half miles from the ends of the runways having a precision instrument approach.

ii. Notice must be provided for all structures measuring 200 feet above ground level measured at the point of highest elevation of the foundation or where it has been determined that the proposed construction penetrates the Federal Aviation Regulation Part 77 imaginary surfaces.

3. When requested by the FAA, any construction or alteration that would be in an instrument approach area and available information indicates the height might exceed any FAA obstruction standard, must be submitted for review.

b. Notice to FAA: nothing in this section shall be construed as relieving any property owner, sponsor or agent from the requirement for filing a notice of proposed construction or alteration with the appropriate Federal Aviation Administration.

c. A copy of a determination of no hazard or similar documentation will be required from the FAA, and the NAS FW JRB, as applicable, before release of a building permit by the City of Fort Worth.

(6) *Marking of nonconforming structures.* The owner of any nonconforming structure or object of natural growth deemed an operational hazard by the City of Fort Worth and/or Naval Air Station Joint Reserve Base is required to install and maintain thereon markers and lighting to indicate to the operators of aircraft in the vicinity of the airport the presence of such airport hazards. Such markers and lights shall be installed, operated and maintained at the expense of the property owner, as required by the FAA.

(c) *Naval Air Station Fort Worth Joint Reserve Base.*

(1) *Purpose and intent.* The City of Fort Worth has designated a NAS FW JRB compatible use zone (AO-CUZ) in order to promote the public health, safety, peace, comfort, convenience and general welfare of the inhabitants of and near military airport environs and to prevent the impairment of military airfields and the public investment therein. The land areas below military airport take off and final approach paths are exposed to significant danger of aircraft accidents. It is, therefore, necessary to limit the density of development and intensity of uses in such areas. The NAS FW JRB compatible use zone is intended to: guide, control and regulate future growth and development; promote orderly and appropriate use of land; protect the character and stability of existing land uses; enhance the quality of living in the areas affected; protect the general economic welfare by restricting incompatible land uses; prevent the

establishment of any land use which would endanger aircraft operations and the continued use of the NAS FW JRB.

(2) *Boundaries.* The specific boundaries of the NAS FW JRB compatible use zone are shown on the official zoning map maintained by the city and depicted and attached as Exhibit B.27. The compatible use zones include the clear zones and accident potential zones (APZs).

(3) *Use restrictions in accident potential zones and clear zone.*

a. Permitted uses shall be allowed in accordance with Table 1, attached and incorporated hereinto the zoning ordinance.

b. Certain uses, unless stated otherwise, within Table 1 shall be prohibited within the APZs. Prohibited uses include, but are not limited to, new residences, schools, places of public assembly and outdoor recreation uses. Other prohibited uses include the manufacture of flammable or combustible liquids or materials, the generation of any substance that would impair visibility or otherwise interfere with the operation of aircraft including steam/dust/smoke; and uses that may encourage the congregation of birds or waterfowl increasing the chance of a bird strike including landfills.

c. Above ground fuel storage facilities shall be permitted only in accordance with the Uniform Fire Code.

d. All new nonresidential uses indicated on the table as “N” Not Compatible on Table 1 are considered prohibited.

(4) *Residential uses.* In lieu of the requirements of Chapter 7, Nonconformities regarding construction, the following shall be allowed within the AO-CUZ.

a. Existing residential one-family uses located within a platted residential subdivision will be permitted to reconstruct a single-family residential structure.

b. New residential construction shall be permitted only on vacant lots that are within an existing platted residential subdivision. This section does not apply to residential properties located within the clear zone.

c. Tracts or lots may not be subdivided.

(5) *Existing nonresidential uses and structures.* In lieu of the requirements of Chapter 7, Nonconformities regarding construction and continuation of use, the following shall be allowed within the AO-CUZ

a. Existing nonresidential uses or structures may reconstruct a structure for the same nonconforming use with equal or less square footage that had previously existed on the property or for such other use that has a density equal to or less than the prior use. Density will be measured from the occupancy count as determined by the city's building official.

b. A nonresidential structure that is vacant for any period of time will be allowed to request a certificate of occupancy for a new tenant or property owner provided that the use requested is identical to the use identified on the last certificate of occupancy for the structure, or is for a use that has a density equal to or less than the previous use of the structure. Density will be measured from the occupancy count as determined by the city's building official.

c. A certificate of occupancy may be issued for new tenants or property owners and changes of use for any use allowed in a shopping center with multiple tenant spaces or an existing regional mall site, as stated in Table 1, Note 7 and Note 8.

d. In an existing structure, a use not allowed in Table 1 will be allowed provided that the proposed nonconforming use has a density equal to or less than the previous use of the structure. A use changed to a lower density than had previously existed may not thereafter be returned to a use of higher density, provided however the aforementioned shall not apply to a shopping center or an existing regional mall site.

e. Any tenant or property owner of a building within an existing regional mall site shall be permitted to construct, re-construct, relocate and redevelop the square footage existing within the APZ-I area as of the effective date of this ordinance plus an additional 25,000 square feet of building improvements at any location solely within 400 feet of the eastern APZ-I boundary. The additional 25,000 square feet within 400 feet of the eastern APZ-1 boundary shall be allocated to and located upon the applicable portion of the property described as Parcel 1 in the special warranty deed filed of record under Instrument No.D205100827, Real Property Records, Tarrant County, Texas (the "developer's parcel") or such other tract within 400 feet of the eastern APZ-I boundary designated by the owner of the developer's parcel.

f. A nonconforming use if changed to a conforming use may not thereafter be changed to a nonconforming use, provided however the aforementioned shall not apply to a shopping center or an existing regional mall site.

(6) *Boundaries.* The specific boundary of the Naval Air Station Fort Worth Joint Reserve Base Airport Overlay is shown on the official zoning map maintained by the city and depicted and attached as Exhibit B.27A.

(7) *Communications facilities and electrical interference.* No use shall cause electrical interference with navigational signals or radio communications at the airport or with radio or electronic communications between the airport and aircraft. Proposals for the location of new or expanded radio, radio-telephone, television transmission facilities, electrical transmission

lines and wind turbines shall be coordinated through the Department of the Navy Representative, FAA Central Service Area prior to approval.

(8) *Outdoor lighting.*

a. No use shall project lighting directly onto an existing runway or taxiway or into existing airport approach and landing paths except where necessary for safe and convenient air travel. Lighting for any new or expanded use shall incorporate shielding in their designs to reflect light away from airport approach and landing paths. Control of outdoor lighting shall be achieved primarily through the use of such means as cutoff fixtures, shields and baffles, and appropriate application of fixture mounting height, wattage, aiming angle and fixture placement.

b. *Criteria.* Lighting shall meet the following criteria:

1. *Lighting arrangement.* Lighting arrangements that mimic runway lighting (i.e., long linear parallel rows of lighting) that could be confused with runway or taxiway lighting are not permitted.

2. *Illumination levels.* Lighting shall have intensities, uniformities and glare control in accordance with the recommended practices of the Illuminating Engineering Society of North America (IESNA), unless otherwise directed by the City of Fort Worth.

3. *Lighting fixture design.*

i. Fixtures shall be of a type and design appropriate to the lighting application.

ii. For the lighting of predominantly horizontal surfaces such as, but not limited to parking areas, roadways, vehicular and pedestrian passage areas, merchandising and storage areas, automotive-fuel dispensing facilities, automotive sales areas, loading docks, cul-de-sacs,

active and passive recreational areas, building entrances, sidewalks, bicycle and pedestrian paths, and site entrances, fixtures shall be aimed straight down and shall meet IESNA full-cutoff criteria. Fixtures, except those containing directional lamps, with an aggregate rated lamp output not exceeding 500 lumens, e.g., the rated output of a standard non-directional 40-watt incandescent lamp, are exempt from the requirements of this subsection. In the case of decorative street lighting, the City of Fort Worth may approve the use of luminaires that are fully shielded or comply with IESNA cutoff criteria.

iii. For the lighting of predominantly non-horizontal surfaces such as, but not limited to, facades, landscaping, signs, billboards, fountains, displays and statuary, fixtures shall be fully shielded and shall be installed and aimed so as to not project their output past the object being illuminated or skyward. Fixtures, except those containing directional lamps, with an aggregate rated lamp output not exceeding 500 lumens, e.g., the rated output of a standard non-directional 40-watt incandescent lamp, are exempt from the requirements of this subsection.

iv. "Barn lights," aka "dusk-to-dawn lights," shall be shielded.

4. *Billboards and signs.*

i. Externally illuminated billboards and signs shall have fixtures mounted at the top of the billboard or sign and aimed downward. The fixtures shall be designed, fitted and aimed to shield the source from off-site view and to place the light output onto and not beyond the sign or billboard. The face of the sign or billboard and the illumination shall not exceed 30-vertical footcandles during the hours of darkness.

ii. The light source for internally illuminated signs and billboards shall not exceed 1,000 initial lumens per square foot of sign face.

iii. Rotating, traveling, pulsing, flashing or oscillating light sources, lasers, beacons, searchlights or strobe lighting shall not be permitted.

iv. The use of highly reflective signage that creates nuisance glare or a safety hazard is not permitted.

(9) *Glare.*

a. No use shall cause glare by highly reflective materials, including but not limited to unpainted metal or reflective glass, on the exterior of structures located within airport approach and landing paths or on nearby lands where glare could impede a pilot's vision. Proposed solar arrays shall be coordinated through the Department of the Navy Representative, FAA Central Service Area prior to approval. The control of glare shall meet the following criteria:

b. *Criteria.*

1. Vegetation screens shall not be employed to serve as the primary means for controlling glare. Rather, glare control shall be achieved primarily through the use of such means as cutoff fixtures, shields and baffles, and appropriate application of fixture mounting height, wattage, aiming angle and fixture placement. Glare surface suppressants that effectively reduce glare may also be utilized.

2. All lighting shall be aimed, located, designed, fitted and maintained so as not to present a hazard to pilots or the safe operation of aircraft.

3. Directional fixtures such as floodlights and spotlights shall be shielded, installed and aimed that they do not project their output past the object being illuminated or skyward.

4. Except as permitted for certain recreational lighting, fixtures not meeting IESNA full-cutoff criteria shall not be mounted in excess of 16 feet above finished grade. Fixtures meeting IESNA full-cutoff criteria shall not be mounted in excess of 20 feet above finished grade.

5. Flag lighting sources shall have a beam spread no greater than necessary to illuminate the flag and shall be adequately shielded.

(10) *Emissions.* No use shall, as part of its regular operations, cause emissions of smoke, ash, vapor, gas, dust, steam or other emissions that could obscure visibility of pilots or conflict with airport operations.

(11) *Wildlife attractants.* No use shall foster an increase in wildlife population and thereby increase the likelihood of a bird impact problem.

(12) *Waste disposal facilities.*

a. No new waste disposal facilities shall be permitted with 10,000 feet of any airport unless approval is obtained from the FAA.

b. Expansions of existing land disposal facilities within these distances shall be permitted only upon demonstration that the facility is designed and will operate so as not to increase the likelihood of bird/aircraft collisions. Timely notice of any proposed expansion shall be provided to the City of Fort Worth, Texas DOT and the FAA, and any approval shall be accompanied by such conditions as are necessary to ensure that an increase in bird/aircraft collisions is not likely to result.

ORDINANCE NUMBER 17680-08-2007

AN ORDINANCE AMENDING THE FORT WORTH BUILDING CODE, BY PROVIDING FOR SOUND ATTENUATION CONSTRUCTION REQUIREMENTS NEAR THE NAVAL AIR STATION JOINT RESERVE BASE; PROVIDING PENALTIES FOR THE VIOLATION THEREOF; PROVIDING THAT THIS ORDINANCE SHALL BE CUMULATIVE; PROVIDING A SEVERABILITY CLAUSE; PROVIDING A SAVINGS CLAUSE; PROVIDING FOR PUBLICATION IN PAMPHLET FORM; PROVIDING FOR PUBLICATION IN THE OFFICIAL NEWSPAPER; AND PROVIDING AN EFFECTIVE DATE.

WHEREAS, the City of Fort Worth has determined that it is appropriate to protect persons within designated noise sensitive buildings from excessive exterior noise near airports through regulations of design and construction of such new buildings in the vicinity of the designated airports;

NOW, THEREFORE, BE IT ORDAINED BY THE CITY COUNCIL OF THE CITY OF FORT WORTH, TEXAS, AS FOLLOWS:

SECTION 1.

Section 7-47 of the Code of the City of Fort Worth (1986) is amended by adding a new Division II to Chapter 12 as follows:

CHAPTER 12
DIVISION II

SOUND INSULATION REQUIREMENTS FOR NOISE SENSITIVE USES NEAR AIRPORTS

SECTION 1211
GENERAL

1211.1 Scope. The regulations and requirements shall apply to all new residential buildings and new noise-sensitive non-residential buildings, as defined herein, that are located wholly or partially within the boundaries of the 65 DNL or greater noise contours as designated in Figure 1211.1(1).

The term "new" shall apply to new detached buildings built after the effective date of this ordinance, and shall include later additions or modifications to those same buildings. The term shall also include a Change of Occupancy in existing buildings from a non-protected occupancy to one of the protected occupancies listed herein.

Buildings in existence prior to the effective date, and additions to or modifications of those same buildings, shall not be required to comply, except when a Change of Occupancy from a non-protected occupancy to one of the protected uses is involved.

SECTION 1212
DEFINITIONS

1212.1 General. The following words and terms shall, for the purposes of this chapter and as used elsewhere in this code, have the meanings shown herein.

Aircraft noise – is generally expressed in terms of it's A-weighted sound level, in units called "decibels." Strictly speaking, the decibel unit should be abbreviated only by "dB"; however, for clarity "dBA" and "dB(A)" are often used to highlight the fact that the sound level measurement has been A-weighted.

Noise exposure – in areas around airports is expressed in terms of the Day-Night Average Sound Level, which is abbreviated by "DNL" in text and "L_{dn}" in equations.

NOISE-SENSITIVE NON-RESIDENTIAL BUILDINGS –

1. Nursing homes and hospitals, generally classified as Group I; and
2. Child day care centers, Adult day care centers and schools, generally classified as Group E and Group I-4.

RESIDENTIAL STRUCTURES: Single-family, Two-family, Townhouse, Multi-family, and Assisted Living uses, generally classified as Group R, whether in a single occupancy or mixed occupancy.

Sound insulation properties – of building construction materials are described by Sound Transmission Loss (TL) or Sound Transmission Class (STC). The higher the TL or STC value, the less sound will be transmitted through the building material.

SECTION 1213
PURPOSE

1213.1 General. All buildings and structures with protective uses, as applicable under this Division, shall be required to have minimum sound insulation standards and requirements to protect the persons within designated noise sensitive buildings from excessive exterior noise through regulation of design, construction and modification of such buildings. After proper sound insulation measures are taken, the interior sound level, attributable to exterior sources, shall not exceed 45 dB.

With the request for a building permit application, or Change of Use permit application, submitted plans shall show evidence of compliance with the sound insulation requirements. Compliance shall consist of submittal of an acoustical analysis report as follows:

1. In accordance with the prescriptive requirements of Section 1214 or the default ratings of Section 1215; or
2. Any qualified design prepared under by a person experienced in the field of acoustical engineering or a registered architect.

SECTION 1214
BUILDING REQUIREMENTS

1214.1 General. Compliance with the following prescriptive provisions shall be deemed to be in compliance with this Division.

1214.2 Building requirements for construction in the 65 dB zone.

1. **Exterior Walls.**
   Walls that form the exterior envelope may be as listed below and shall be constructed as follows:

   a. Wood walls with studs at least 4 inches in nominal depth. Exterior finish shall be stucco, minimum 7/8-inch thickness, brick veneer, masonry, or any siding material allowed by this code. Wood, metal or cementitious fiber siding shall be installed over ½-inch solid sheathing.

      Wall insulation shall be at least R-13 glass fiber, or mineral wool or equal and shall be installed continuously throughout the stud space. Foam insulation, as permitted by this code, shall be accepted provided it solidifies to a spongy state and not solid or rigid.

      Interior wall finish shall be at least ½" gypsum wallboard

   b. Masonry or concrete load bearing walls. Masonry walls with a surface weight of less than 40 pounds per square foot will require an interior supporting studwall that is finished as required by Item a above.

   c. Or, it is permitted to use any wall designated in Section 1215 with a default STC value of 25* or greater.

2. **Exterior Windows**
   Windows in the exterior envelope shall be constructed as follows:

a. All openable windows in the exterior walls shall have a laboratory sound transmission class rating of at least STC 30 dB and shall have air infiltration rate of no more than 0.5 cubic feet per minute when tested according to ASTM E-283; or, shall be double thermopane windows meeting the requirements of the Energy Code.
b. All fixed windows in the exterior walls shall be at least ¼-inch thick and shall be set in non-hardening glazing materials; or, shall be double thermopane windows meeting the requirements of the Energy Code.
c. Or, it is permitted to use any window designated in Section 1215 with a default STC value of 25* or greater.
d. The total area of glazing in rooms used for sleeping shall not exceed 20 percent of the floor area.

3. **Exterior Doors**
   a. Exterior hinged doors shall be as follows:
      1. a door and edge seal assembly that has a laboratory sound transmission class rating of at least STC 30 dB; or
      2. a door, other than a hollow core wood door, that complies with the Energy Code; or,
      3. any door installed with a storm door; or,
      4. doors installed as part of a vestibule.
   b. Sliding glass doors shall have glass that has a laboratory sound transmission class rating of at least STC 30 dB; or, shall be a sliding glass door that complies with the Energy Code.
   c. Access doors from a garage to a room within a dwelling shall have a laboratory sound transmission rating of at least STC 30 dB; or, shall comply with the Energy Code as a door in the exterior envelope.
   d. Or, it is permitted to use any door designated in Section 1215 with a default STC value of 25* or greater.
   e. View windows in doors and sidelights shall comply with item 2 above, unless used in a door as listed in 3a above.

4. **Roof/Ceiling Construction**
   a. Roof rafters shall have a minimum slope of 4:12 and shall be covered on their top surface with ½-inch solid sheathing and any roof covering allowed by this code. An accessible attic space shall be provided above rooms on the uppermost level of Group R buildings.
   b. Commercial type flat roofs are permitted if insulated as required by the Energy Code and a separate lay-in ceiling is added below with an airspace between the two.
   c. Cathedral ceilings are discouraged but, if installed, must have enough space to install the insulation of Item d below, with a minimum of 6" air space between the insulation and the roof deck.
   d. Attic insulation shall be batt or blown-in glass fiber or mineral wool with a minimum R-30 rating applied between the ceiling joists.
   e. Attic ventilation, when installed, shall be:

1. Gable vents or other attic vents that penetrate the attic enclosure shall be fitted with a ½" plywood panel, with 1" semi-rigid insulation attached to the surface facing the vent, so that the panel is at least six inches larger than the vent opening on all sides and is attached to prevent direct line-of-site perpendicular to the vent. The new panel shall also be positioned so that the amount of ventilation is not reduced. Or,
2. Eave vents that are located under the roof overhang.

f. Ceilings shall be finished with gypsum board or plaster that is at least 5/8-inch thick;
or,
½" gypsum board on resilient channels (RC) installed 16" o.c. perpendicular to the joists. Gypsum screws into the RC shall not be long enough to penetrate the wood stud by more than ¼" if occurring over the stud location;
or,
a lay-in ceiling with an airspace.

g. Skylights shall penetrate the ceiling by means of a completely enclosed light well that extends from the roof opening to the ceiling opening. A secondary openable glazing panel shall be mounted at the ceiling line and shall be glazed with at least 3/16-inch plastic, tempered or laminated glass. The weather-side skylight shall be any type that is permitted by this code. The total size of skylights shall be no more than 20 percent of the roof area of the room.

5. Floors

The floor of the lowest occupied rooms shall be slab on fill, below grade or over a fully enclosed basement or crawlspace. All door and window openings in the fully enclosed basement shall be tightly fitted. All crawlspace vents must be fitted with a ½" plywood panel, with 1" semi-rigid insulation attached to the surface facing the vent, so that the panel is at least six inches larger than the vent opening on all sides and is attached to prevent direct line-of-site perpendicular to the vent. The new panel shall also be positioned so that the amount of ventilation is not reduced.

6. Ventilation

a. A ventilation system shall be provided that will provide at least the minimum air circulation and fresh air supply requirements of the Mechanical Code, in each room without opening any windows, door or other opening to the exterior. Openable windows or doors will not be counted for compliance with the fresh air provisions. Fresh air must be brought in through the HVAC system.
b. Window and/or through-the-wall ventilation or air-conditioning units shall not be used.
c. All vent ducts connecting the interior space to the outdoors shall contain at least a ten-foot length of internal sound-absorbing duct lining. Each duct shall be provided with a ninety-degree (right angle) bend in the duct such that there is no direct line-of-sight through the duct from the venting cross-section to the room-opening cross-section. Residential bathroom vents discharging at an eave vent need only to have two ninety-degree (right angle) bends.
d. Kitchen cooktop vent hoods shall be the non-ducted recirculating type with no ducted connection to the exterior.

7. **Fireplaces**
   Each fireplace constructed of masonry units shall be fitted with a spark arrestor, a damper as required by code and shall have glass doors across the front of the firebox.

8. **Wall and Ceiling Openings**
   Openings in the exterior that degrades its ability to achieve an interior rating of 45 dB or less when all doors and windows are closed are prohibited. Any access panels, pet doors, mail delivery drops, air conditioning, or other openings must be designed to maintain the 45 dB or less standard in the room to which they provide access.

   At the penetration of exterior walls by pipes, ducts, or conduits, the space between the wall and pipes, ducts, or conduits shall be caulked at the pipe duct or conduit or filled with mortar to the wall.

*STC ratings may overstate the actual attenuation provided by as much as 3 dB, therefore, 25 STC rating in lieu of 20 is mandated.

1214.3 Building requirements for construction in the 70 dB zone.

1. **Exterior Walls**
   Walls that form the exterior envelope may be as listed below and shall be constructed as follows:

   a. Wood walls with studs at least 4 inches in nominal depth. Exterior finish shall be stucco, minimum 7/8-inch thickness, brick veneer, masonry, or any siding material allowed by this code. Wood, metal or cementitious fiber siding shall be installed over ½-inch solid sheathing.

      Wall insulation shall be at least R-13 glass fiber, or mineral wool or equal and shall be installed continuously throughout the stud space. Foam insulation, as permitted by this code, shall be accepted provided it solidifies to a spongy state and not solid or rigid.

      Interior wall finish shall be at least 5/8-inch gypsum wallboard or plaster;
      or,
      ½" gypsum wallboard installed on resilient channels (RC) installed 16" o.c. perpendicular to the studs. Gypsum screws into the RC shall not be long enough to penetrate the wood stud by more than ¼" if occurring over the stud location.

   b. Masonry or concrete load bearing walls. Masonry walls with a surface weight of less than 40 pounds per square foot will require an interior supporting studwall that is finished as required by Item a above.

   c. Or, it is permitted to use any wall designated in Section 1215 with a default STC value of 30* or greater. When using door/window openings with a default STC

value of less than 30 STC but not less than 25 STC, the STC of the wall shall be downrated by 20%.

2. Exterior Windows

Windows in the exterior envelope shall be constructed as follows:

a. All openable windows in the exterior walls shall have a laboratory sound transmission class rating of at least STC 35 dB and shall have air infiltration rate of no more than 0.5 cubic feet per minute when tested according to ASTM E-283.

b. All fixed windows in the exterior walls of rooms shall:
   1. Have a laboratory sound transmission class rating of at least STC 35 db, or
   2. Be 5/8-inch laminated glass with a laboratory sound transmission class rating of at least STC 35 db and shall be set in non-hardening glazing materials, or
   3. Be glass block at least 3-1/2 inches thick.

c. Or, it is permitted to use any window designated in Section 1215 with a default STC value of 30* or greater.

d. The total area of glazing in rooms used for sleeping shall not exceed 20 percent of the floor area.

3. Exterior Doors

a. Exterior hinged doors shall be as follows:
   1. a door and edge seal assembly that has a laboratory sound transmission class rating of at least STC 35 dB; or
   2. a door, other than a hollow core wood door, that complies with the Energy Code and installed with a storm door; or,
   3. doors installed as part of a vestibule.

b. Sliding glass doors shall have glass that has a laboratory sound transmission class rating of at least STC 35 dB.

c. Access doors from a garage to a room within a dwelling shall have a laboratory sound transmission rating of at least STC 30 dB; or, shall comply with the Energy Code as a door in the exterior envelope.

d. Or, it is permitted to use any door designated in Section 1215 with a default STC value of 30* or greater.

e. View windows in doors and sidelights shall comply with item 2 above, unless used in a door as listed in 3a above.

4. Roof/Ceiling Construction

a. Roof rafters shall have a minimum slope of 4:12 and shall be covered on their top surface with ½-inch solid sheathing and any roof covering allowed by this code. An accessible attic space shall be provided above rooms on the uppermost level of Group R buildings.

b. Commercial type flat roofs are permitted if insulated as required by the Energy Code and a separate lay-in ceiling is added below with an airspace between the two.

c. Cathedral ceilings are discouraged but, if installed, must have ¾" solid decking above, enough space to install the insulation of Item d below, with a minimum of 6" air space between the insulation and the roof deck.
d. Attic insulation shall be batt or blown-in glass fiber or mineral wool with a minimum R-30 rating applied between the ceiling joists.
e. Attic ventilation, when installed, shall be:
   1. Gable vents or other attic vents that penetrate the attic enclosure shall be fitted with a ½" plywood panel, with 1" semi-rigid insulation attached to the surface facing the vent, so that the panel is at least six inches larger than the vent opening on all sides and is attached to prevent direct line-of-site perpendicular to the vent. The new panel shall also be positioned so that the amount of ventilation is not reduced. Or,
   2. Eave vents that are located under the roof overhang.
f. Ceilings shall be finished with gypsum board or plaster that is at least 5/8-inch thick. Ceiling materials shall be mounted on resilient channels;
   or,
   a lay-in ceiling with an airspace.
g. Skylights shall penetrate the ceiling by means of a completely enclosed light well that extends from the roof opening to the ceiling opening. A secondary openable glazing panel shall be mounted at the ceiling line or at a point that provides at least a 4-inch space between the skylight glazing and the secondary glazing and shall be glazed with at least 3/16-inch plastic or laminated glass. The weather-side skylight shall be any type that is permitted by this code. The total size of skylights shall be no more than 20 percent of the roof area of the room.

5. Floors

The floor of the lowest occupied rooms shall be slab on fill, below grade or over a fully enclosed basement or crawlspace. All door and window openings in the fully enclosed basement shall be tightly fitted. All crawlspace vents must be fitted with a ½" plywood panel, with 1" semi-rigid insulation attached to the surface facing the vent, so that the panel is at least six inches larger than the vent opening on all sides and is attached to prevent direct line-of-site perpendicular to the vent. The new panel shall also be positioned so that the amount of ventilation is not reduced.

6. Ventilation

a. A ventilation system shall be provided that will provide at least the minimum air circulation and fresh air supply requirements of the Mechanical Code, in each room without opening any windows, door or other opening to the exterior. Openable windows or doors will not be counted for compliance with the fresh air provisions. Fresh air must be brought in through the HVAC system.
b. Window and/or through-the-wall ventilation or air-conditioning units shall not be used.
c. All vent ducts connecting the interior space to the outdoors shall contain at least a ten-foot length of internal sound-absorbing duct lining. Each duct shall be provided with a ninety-degree (right angle) bend in the duct such that there is no direct line-of-sight through the duct from the venting cross-section to the room-

opening cross-section. Residential bathroom vents discharging at an eave vent need only to have two ninety-degree (right angle) bends.

d. Kitchen cooktop vent hoods shall be the non-ducted recirculating type with no ducted connection to the exterior.

7. **Fireplaces**
Each fireplace constructed of masonry units shall be fitted with a spark arrestor, a damper as required by code and shall have glass doors across the front of the firebox.

8. **Wall and Ceiling Openings**
Openings in the exterior that degrades its ability to achieve an interior rating of 45 dB or less when all doors and windows are closed are prohibited. Any access panels, pet doors, mail delivery drops, air conditioning, or other openings must be designed to maintain the 45 dB or less standard in the room to which they provide access.

At the penetration of exterior walls by pipes, ducts, or conduits, the space between the wall and pipes, ducts, or conduits shall be caulked at the pipe duct or conduit or filled with mortar to the wall.

*STC ratings may overstate the actual attenuation provided by as much as 3 dB, therefore, 30 STC rating in lieu of 25 is mandated.

1214.4 Building requirements for construction in the 75 dB or greater areas.

1. **Exterior Walls**
Walls that form the exterior envelope may be as listed below and shall be constructed as follows:

a. Wood walls with studs at least 4 inches in nominal depth. Exterior finish shall be stucco, minimum 7/8-inch thickness, brick veneer, masonry, or any siding material allowed by this code. Wood, metal or cementitious fiber siding shall be installed over 3/4-inch solid sheathing.

Wall insulation shall be at least R-13 glass fiber, or mineral wool or equal and shall be installed continuously throughout the stud space. Foam insulation, as permitted by this code, shall be accepted provided it solidifies to a spongy state and not solid or rigid.

Interior wall finish shall be at least 5/8-inch gypsum wallboard installed on resilient channels (RC) installed 16" o.c. perpendicular to the studs. Gypsum screws into the RC shall not be long enough to penetrate the wood stud by more than ¼" if occurring over the stud location.

b. Masonry or concrete load bearing walls. Masonry walls with a surface weight of less than 40 pounds per square foot will require an interior supporting studwall that is finished as required by Item a above.

c. Or, it is permitted to use any wall designated in Section 1215 with a default STC value of 35* or greater. When using door/window openings with a default STC value of less than 35 STC but not less than 30 STC, the STC of the wall shall be downrated by 20%.

2. Exterior Windows

Windows in the exterior envelope shall be constructed as follows:

a. All openable windows in the exterior walls shall have a laboratory sound transmission class rating of at least STC 40 dB and shall have air infiltration rate of no more than 0.5 cubic feet per minute when tested according to ASTM E-283.

b. All fixed windows in the exterior walls of rooms shall:
   1. Have a laboratory sound transmission class rating of at least STC 40 db, or
   2. Be 5/8-inch laminated glass with a laboratory sound transmission class rating of at least STC 40 db and shall be set in non-hardening glazing materials, or
   3. Be glass block at least 3-1/2 inches thick.

c. Or, it is permitted to use any window designated in Section 1215 with a default STC value of 35* or greater.

d. The total area of windows and doors in rooms used for sleeping shall not exceed 20 percent of the floor area.

3. Exterior Doors

a. Exterior hinged doors shall be as follows:
   1. a door and edge seal assembly that has a laboratory sound transmission class rating of at least STC 40 dB; or
   2. a solid-core wood or insulated metal door at least one (1) inch thick separated by an airspace of at least four (4) inches from another door, which can be a storm door. Both doors shall be tightly fitted and weather-stripped; or,
   3. doors installed as part of a vestibule.

b. Sliding glass doors shall have glass that has a laboratory sound transmission class rating of at least STC 40 dB;
   or,
   a double sliding glass door, separated by a minimum four-inch airspace. Each door shall comply with the air leakage rate of the Energy Code. Glass shall be at least three-sixteenths (3/16) inch thick but not equal in thickness between the two doors, and tempered or laminated.

c. Access doors from a garage to a room within a dwelling shall have a laboratory sound transmission rating of at least STC 30 dB; or, shall comply with the Energy Code as a door in the exterior envelope.

d. Or, it is permitted to use any door designated in Section 1215 with a default STC value of 35* or greater.

e. View windows in doors and sidelights shall comply with item 2 above, unless used in a door as listed in 3a above.

f. The joint between the wall opening and the door frame shall be continuously filled with glass fiber insulation and the exterior cover trim shall be continuously caulked to seal the joint.

4. **Roof/Ceiling Construction**
   a. Roof rafters shall have a minimum slope of 4:12 and shall be covered on their top surface with ½-inch solid sheathing and any roof covering allowed by this code. An accessible attic space shall be provided above rooms on the uppermost level of Group R buildings.
   b. Commercial type flat roofs are permitted if insulated as required by the Energy Code and a separate lay-in ceiling is added below with an airspace between the two.
   c. Cathedral ceilings are discouraged but, if installed, must have 1" solid decking above, have enough space to install the insulation of Item d below, with a minimum of 6" air space between the insulation and the roof deck. Structural information shall be provided confirming adequate support of the decking.
   d. Attic insulation shall be batt or blown-in glass fiber or mineral wool with a minimum R-30 rating applied between the ceiling joists.
   e. Attic ventilation, when installed, shall be:
      1. Gable vents or other attic vents that penetrate the attic enclosure shall be fitted with a ½" plywood panel, with 1" semi-rigid insulation attached to the surface facing the vent, so that the panel is at least six inches larger than the vent opening on all sides and is attached to prevent direct line-of-site perpendicular to the vent. The new panel shall also be positioned so that the amount of ventilation is not reduced. Or,
      2. Eave vents that are located under the roof overhang.
   f. Ceilings shall be finished with gypsum board or plaster that is at least 5/8-inch thick. Ceiling materials shall be mounted on resilient channels;
      or,
      a lay-in ceiling with an airspace.
   g. Skylights shall penetrate the ceiling by means of a completely enclosed light well that extends from the roof opening to the ceiling opening. A secondary openable glazing panel shall be mounted at the ceiling line or at a point that provides at least a 4-inch space between the skylight glazing and the secondary glazing and shall be glazed with at least 3/16-inch plastic or laminated glass. The weather-side skylight shall be any type that is permitted by this code. The total size of skylights shall be no more than 20 percent of the roof area of the room.

5. **Floors**
   The floor of the lowest occupied rooms shall be slab on fill, below grade or over a fully enclosed basement or crawlspace. All door and window openings in the fully enclosed basement shall be tightly fitted. All crawlspace vents must be fitted with a ½" plywood panel, with 1" semi-rigid insulation attached to the surface facing the vent, so that the panel is at least six inches larger than the vent opening on all sides and is attached to prevent direct line-of-site perpendicular to the vent. The new panel shall also be positioned so that the amount of ventilation is not reduced.

6. **Ventilation**
   a. A ventilation system shall be provided that will provide at least the minimum air circulation and fresh air supply requirements of the Mechanical Code, in each

room without opening any windows, door or other opening to the exterior. Openable windows or doors will not be counted for compliance with the fresh air provisions. Fresh air must be brought in through the HVAC system.

b. Window and/or through-the-wall ventilation or air-conditioning units shall not be used.
c. All vent ducts connecting the interior space to the outdoors shall contain at least a ten-foot length of internal sound-absorbing duct lining. Each duct shall be provided with a ninety-degree (right angle) bend in the duct such that there is no direct line-of-sight through the duct from the venting cross-section to the room-opening cross-section. Residential bathroom vents discharging at an eave vent need only to have two ninety-degree (right angle) bends.
d. Kitchen cooktop vent hoods shall be the non-ducted recirculating type with no ducted connection to the exterior.

7. **Fireplaces**
Each fireplace constructed of masonry units shall be fitted with a spark arrestor, a damper as required by code and shall have glass doors across the front of the firebox.

8. **Wall and Ceiling Openings**
Openings in the exterior that degrades its ability to achieve an interior rating of 45 dB or less when all doors and windows are closed are prohibited. Any access panels, pet doors, mail delivery drops, air conditioning, or other openings must be designed to maintain the 45 dB or less standard in the room to which they provide access.

At the penetration of exterior walls by pipes, ducts, or conduits, the space between the wall and pipes, ducts, or conduits shall be caulked at the pipe duct or conduit or filled with mortar to the wall.

*STC ratings may overstate the actual attenuation provided by as much as 3 dB, therefore, 35 STC rating in lieu of 30 is mandated.

SECTION 1215
DEFAULT COMPONENT RATINGS

1215.1 General. The acoustical performance of the building depends on the combined performances of each of the elements. The final result depends on the transmission loss (or STC) and the relative surface areas of the elements. If any of the components has poor insulation properties the overall performance can be seriously weakened. Windows are usually one of the weakest elements in the dwelling's sound insulation performance.

The following default STC ratings may be used in determining the sound envelope of the building. The required combined default values are as follows:

Zone 65 dB – The sound enclosure must be comprised of all components, wall, window, doors and roof that each have a default STC rating of 25* or higher.

Zone 70 dB – The sound enclosure must be comprised of all components, wall, window, doors and roof that have a default STC rating of 30* or higher. It is permitted to use windows and doors of less than 30 STC but not less than 25 STC rating, provided the wall STC shall be downrated by 20% and the non-compliant window/door area shall not exceed 20% of the floor area per room.

Zone 75 or higher dB – The sound enclosure must be comprised of all components, wall, window, doors and roof that have a default STC rating of 35* or higher. It is permitted to use windows or doors with less than 35 STC but not less than 30 STC rating, provided the wall STC shall be downrated by 20% and the non-compliant window/door area shall not exceed 20% of the floor area per room.

*STC ratings may overstate the actual attenuation provided by as much as 3 dB, therefore, all STC rating requirements are upgraded by 5.

Walls	STC	STC when under-rated windows or doors are used
Exterior siding, ½" solid sheathing, 2 x 4" nominal stud 16" o.c., fiberglass insulation, ½" interior gypsum attached directly to studs	39	31
7/8" stucco, No. 15 felt building paper and 1" wire mesh, 2 x 4" nominal stud 16" o.c., fiberglass insulation, ½" gypsum board attached directly to stud.	46	37
Face Brick, ½" air space with metal ties, ¾" insulation board sheathing, 2 x 4" nominal studs 16" o.c., fiberglass building insulation, ½" gypsum board attached directly to studs	56	45
1" stucco, 8" thick hollow concrete block, ½" gypsum attached to furring strips	49	39
Exterior siding, 7/16" solid sheathing, 2 x 4" nominal stud 16" o.c., batt insulation, resilient channels, ½" gypsum board	43	34
Exterior siding, 7/16" solid sheathing, 2 x 6" nominal stud 16" o.c., batt insulation, resilient channels, ½" gypsum board	47	37
Exterior siding, 7/16" solid sheathing, 2 x 4" staggered studs 16" o.c. on 2 x 6" base plate, batt insulation, ½" gypsum attached directly to studs	50	40

Windows	STC
Wood double hung, closed but unlocked, single glazing	23
Aluminum sliding, latched, single glazing	24

Wood double hung, closed but unlocked, glazed with 7/16" insulating glass	22
1/8" double glazed window with ¼" air space	26
¼" single glazed window	30
¼" laminated glass single glazed window	34
¼" + 1/8" double glazed window with 2" airspace	39
¼" + 1/8" double glazed window with 4 ¾" airspace	43

Doors	**STC**
Wood, flush solid core, with brass weather stripping	27
Wood, flush solid core, plastic weather stripping, aluminum storm door	34
Wood, French door, brass weather stripping	26
Steel, flush, with urethane foam core, with magnetic weather stripping	28
Wood, solid core	26
Steel or fiberglass	25
Sliding glass	27

Wood double hung, closed but unlocked, glazed with 7/16" insulating glass	22
1/8" double glazed window with ¼" air space	26
¼" single glazed window	30
¼" laminated glass single glazed window	34
¼" + 1/8" double glazed window with 2" airspace	39
¼" + 1/8" double glazed window with 4 ¾" airspace	43

Doors	**STC**
Wood, flush solid core, with brass weather stripping	27
Wood, flush solid core, plastic weather stripping, aluminum storm door	34
Wood, French door, brass weather stripping	26
Steel, flush, with urethane foam core, with magnetic weather stripping	28
Wood, solid core	26
Steel or fiberglass	25
Sliding glass	27

SECTION 2.

This article shall be cumulative of all provisions of ordinances and of the Code of the City of Fort Worth, Texas (1986), as amended, except where the provisions of this article are in direct conflict with the provisions of such ordinances and such Code, in which event conflicting provisions of such ordinances and such Code are hereby repealed.

SECTION 3.

It shall be unlawful for any person to erect, construct, enlarge, alter, repair, move, improve, remove, convert, demolish, equip, use, occupy, or maintain any building or structure in the City or cause the same to be done contrary to or in violation of any of the provisions of this Code. Any person, firm or corporation violating any of the provisions of this ordinance shall be deemed guilty of a misdemeanor and upon conviction thereof shall be punishable by a fine not to exceed Two Thousand Dollars ($2,000.00) for all violations involving fire safety, or public health and sanitation and shall be fined not more than Five Hundred Dollars ($500.00) for all other violations of this ordinance. Each day or any portion thereof during which any violation of this ordinance occurs or continues shall be deemed a separate offense and upon conviction thereof shall be punishable as herein provided.

SECTION 4.

It is hereby declared to be the intention of the City Council that the sections, paragraphs, sentences, clauses, and phrases of this ordinance are severable, and, if any phrase, clause, sentence, paragraph, or section of this ordinance shall be declared void, ineffective, or unconstitutional by the valid judgment or final decree of any court of competent jurisdiction, such voidness, ineffectiveness, or unconstitutionality shall not affect any of the remaining phrases, clauses, sentences, paragraphs, and sections of this ordinance, since the same would have been enacted by the City Council without the incorporation in this ordinance of any such void, ineffective, or unconstitutional phrase, clause, sentence, paragraph, or section.

SECTION 5.

This ordinance constitutes a digest and revision of the Building Code of the City of Fort Worth, as provided in Section 2, Chapter XXV, and Section 9, Chapter XXVII, of the Charter of the City of Fort Worth. The Development Department of the City of Fort Worth, Texas, is hereby authorized to publish this ordinance in pamphlet form for general distribution among the public, and the operative provisions of this ordinance, as so published, shall be admissible in evidence in all courts without further proof than the production thereof, as provided in Chapter XXV, Section 3, of the Charter of the City of Fort Worth, Texas.

SECTION 6.

The City Secretary of the City of Fort Worth, is hereby directed to publish the caption, penalty clause, and effective date of this ordinance for two (2) days in the official newspaper of the City of Fort Worth, Texas as authorized by Section 2, Chapter XXV of the Charter of the City of Fort Worth, Texas and by Section 52.013 (a) of the Texas Local Government Code.

SECTION 7.

This ordinance shall take effect upon adoption and publication as required by law.

APPROVED AS TO FORM AND LEGALITY:

Melinda Remor
Assistant City Attorney

Adopted: August 9, 2007

Effective: August 24, 2007

City of Fort Worth, Texas

Mayor and Council Communication

COUNCIL ACTION: Approved on 8/9/2007 - Ord. Nos. 17680-08-2007 and 17681-08-2007

DATE: Thursday, August 09, 2007
LOG NAME: 06AIRPORT NOISE **REFERENCE NO.: PZ-2747**

SUBJECT:
Adopt Ordinances Amending the Building Code and Residential Code to Add Noise Attenuation Provisions for Noise-Sensitive Uses in the Naval Air Station Joint Reserve Base Noise Impact Areas

RECOMMENDATION:

It is recommended that the City Council adopt the attached ordinances amending the Building Code and the Residential Code by adding construction provisions for attenuation of airport noise for certain uses in the Naval Air Station Joint Reserve Base noise impact areas.

DISCUSSION:

The City of Fort Worth, other adjacent municipalities, and Tarrant County are participating in a Joint Land Use Study (JLUS) associated with the Naval Air Station Joint Reserve Base. The purpose of the JLUS is to promote compatible community growth that supports military training and operational missions at the Joint Reserve Base. A JLUS Policy Committee is overseeing the study and will issue recommendations in October 2007. The recommendations will seek to minimize incompatible development in the noise impact areas, which are depicted in the attached ordinances. Each municipality will then review the recommendations and revise their development regulations on an individual basis.

Given the potential for incompatible development while the study recommendations are prepared and implemented, the City Council authorized staff to prepare building code amendments for noise sensitive uses in the noise impact areas. These uses include residences, nursing homes, hospitals, day care centers, and schools. The code amendments would require noise attenuation in the construction of new buildings to achieve an interior noise level of 45 DNL. The requirements will apply to exterior walls, exterior windows, exterior doors, roof/ceiling construction, wall and ceiling openings, floors, ventilation and fireplaces. The attached ordinances would amend the Building Code and the Residential Code.

In June and July, City staff briefed affected property owners, the Development Advisory Committee, and representatives of the Fort Worth Builders Association, Greater Fort Worth Association of Realtors, and the Fort Worth Chamber of Commerce. The City Council endorsed the proposed code amendments at the pre-Council meeting on July 31.

The ordinance amendments would affect property in COUNCIL DISTRICTS 3 and 7.

FISCAL INFORMATION/CERTIFICATION:

The Finance Director certifies that this action will have no material effect on City funds.

TO Fund/Account/Centers	FROM Fund/Account/Centers
Submitted for City Manager's Office by:	Dale Fisseler (6266)
Originating Department Head:	Fernando Costa (8042)
Additional Information Contact:	Al Godwin (7825)

City of Benbrook - "NAS" OVERLAY DISTRICT

Sections:

17.78.010 - Purpose.

The purpose of this overlay district is to provide uses that are compatible with the aircraft operations at the Naval Air Station Fort Worth Joint Reserve Base. The boundaries of the district will be adopted by the city council and will approximate the area within the city that may be affected by day-night level (DNL) noise levels of sixty-five decibels (dB) or greater. The basis for the determination of the area affected by the sixty-five DNL will be the most recently-adopted Air Installation Compatible Use Zone (AICUZ) for NAS Fort Worth JRB adopted by the Department of Defense.

(Ord. No. 1344, § 1, 10-18-2012; Ord. No. 1356, § 4, 10-17-2013)

17.78.020 - Use regulations.

In addition to the zoning restrictions contained within the underlying zoning district and not withstanding any other provisions in the underlying district, no new building or newly-developed land shall be used and no buildings shall be hereafter erected, reconstructed, altered, or enlarged, within the "NAS" Overlay District unless they comply with the following restrictions.

(Ord. No. 1344, § 1, 10-18-2012; Ord. No. 1356, § 4, 10-17-2013)

17.78.022 - Permitted uses allowed only with sound attenuation (minimum of 25 dB. reduction).

A. Public, private, and parochial elementary and secondary schools.

B. Higher education institutions.

C. Religious institutions.

D. Museums, libraries and fine arts centers (including auditoriums and concert halls).

(Ord. No. 1344, § 1, 10-18-2012; Ord. No. 1356, § 4, 10-17-2013)

17.78.026 - Prohibited uses.

A. One- and Two-family dwellings are prohibited.

B. Multiple-family dwellings.

Exception: One-, two- or multiple family dwellings that were constructed or occupied on the date of the adoption of this Ordinance, or any existing platted lot that is zoned for one-, two- or multiple family dwellings, may construct or reconstruct within the NAS Overlay zone provided that construction methods are used to achieve an inside sound level reduction of thirty decibels (30 db (A)) from the outside noise level.

(Ord. No. 1344, § 1, 10-18-2012; Ord. No. 1356, § 4, 10-17-2013)

MODEL MILITARY OVERLAY ZONE ORDINANCE

SUMMARY.

A. The Naval Air Station Fort Worth Joint Reserve Base (NAS Fort Worth JRB) Overlay Zoning Districts are intended to provide for uses and unique design requirements for lands adjacent to and within accident potential zones, noise zones, noise zones and restricted airspace zones, for NAS Fort Worth JRB. Site design and other standards are necessary to protect navigable airspace and may include height limitations, smoke limitations, lighting limitations, and other standards necessary to ensure protection of the airspace. These environs have been identified through data provided by NAS Fort Worth JRB and by the Joint Land Use Study conducted by the city.

B. The following documents are hereby adopted by reference as is fully set forth within this Ordinance:

    1. NAS Fort Worth JRB Air Installations Compatible Use Zone (AICUZ) Report.

    2. *Joining Forces* Joint Land Use Study

PURPOSE

The purpose of the NAS Fort Worth JRB Zoning Districts is to:

1. Ensure safety to people and property within the zones;
2. Prohibit the establishment of incompatible structures within the designated zones;
3. Protect the airspace, approach zones, inner horizontal zones, conical zones, outer horizontal zones, and transitional zones from the establishment of structures or placement of objects that interfere with the safe operation of aircraft;
4. Limit land uses within the zones to those uses that are compatible with military operations; and
5. Protect people and property from the potential adverse effects of aircraft noise and aircraft crashes;

ADMINISTRATION.

The following administrative requirements apply to the airport/airfield environs.

Notification of NAS Fort Worth JRB. All applications for rezoning and development approval, including site plans, building permits, subdivision plats, and other permits and plans in the zones shall be subject to review by a representative at NAS Fort Worth JRB. Such review shall be limited to issues of compatibility with NAS Fort Worth JRB and issues affecting the safety of persons and property related to aircraft take-offs, landings, and flight

operations. Comment shall be received in the form of a recommendation to the final approving authority.

NAS FORT WORTH JRB ZONING DISTRICTS.

A. Description of NAS Fort Worth JRB Zoning Districts. NAS Fort Worth JRB Zoning Districts include the established accident potential and noise zones of the airfield and extend outward from those zones at varying distances specific to the installation and its use. Districts include and define areas that are close enough to the installation to affect or to be affected by the mission of the airfield. Because of the relationship of these areas to the airfield, they are subject to additional restrictions on development. The regulations and densities adopted herein are based on the AICUZ findings, the recommendations in Department of Defense Instruction (DoDI) 4165.57 (Air Installations Compatible Use Zones), Office of the Chief of Naval Operations Instruction (OPNAVINST) 11010.36C, and the Joint Land Use Study.

1. Accident Potential Zones (APZs) I

2. Accident Potential Zones (APZs) II

B. General requirements for all zones.

1. *Avigation easements*. All applications for subdivision approval and/or building permits for any structure requiring plan approval shall include the dedication of an avigation easement to the city. The dedicated avigation easement allows property owners to develop land in accordance with the applicable zoning district and regulations. However, military airfields receive a clear right to maintain flight operations over the parcel. The easement is recorded with the deed to a property and runs in perpetuity with the land.

2. *Real Estate Disclosure*. The Seller's Disclosure Notice shall include information that a property may be located near a military installation and may be affected by high noise or air installation compatible use zones or other operations.

3. *Noise reduction standards*. All new buildings shall be constructed with sound protection based on the level of noise exposure, which can be determined by the location of the building within the adopted AICUZ map. Sound attenuation is not required if the site is located outside the 65 decibel (dB) noise contour. Noise reduction standards, construction and methods are specified in

Naval Facilities Engineering Command's Sound Insulation Guidelines for Residences Exposed to Aircraft Operations.

a. The Department of Defense (DoD) recommends an outdoor-to-indoor noise level reduction (NLR) of at least 25 dB for homes in the 65 and 70 dB Day-Night Sound Level (DNL) noise contours.

b. The DoD recommends an outdoor-to-indoor NLR of at least 30 dB for homes in the 70 and 75 dB DNL noise contours.

4. *Uses interfering with aircraft*. It is unlawful to establish, maintain or continue any use within the city in such a manner as to interfere with the operation of aircraft. The following requirements shall apply to all lawfully established uses within the city.

a. *Height*.

b. *Obstruction marking and lighting*. Notwithstanding the provisions of any other article of this ordinance or any other ordinance, the owner of any structure or obstruction over 200 feet above ground level shall install marking and lighting on the structure in accordance with the specific standards established by Federal Aviation Advisory Circular 70/7460-1L - Obstruction Marking and Lighting with Change 1. In

addition, the owner shall install high intensity white obstruction lights on a structure which exceeds 800 feet above ground level (AGL). Towers less than 200 feet may require lighting after Navy evaluation.

c. *Dangerous lighting*. All lights or illumination used in conjunction with street, parking, signs or use of land and structures shall be arranged and operated in such a manner that is not misleading or dangerous to aircraft operating from the airfield as determined by the NAS Fort Worth JRB airfield operator.

d. *Smoke or glare*. No operations of any type shall produce smoke, glare or other visual hazards within three statute miles of any usable runway of NAS Fort Worth JRB.

e. *Electronic interference*. No operations of any type shall produce electronic interference with navigation signals or radio communication between the airfield and the aircraft.

f. *Aircraft-wildlife strike hazards.* Human-made or natural areas, such as poorly-drained sites, retention ponds, roosting habitats on buildings, landscaping, putrescible-waste disposal operations, wastewater treatment plants,

agricultural or aquacultural activities, surface mining, or wetlands, may be used by wildlife for escape, feeding, loafing, or reproduction. Wildlife use of areas within an airfield's approach or departure airspace, aircraft movement areas, loading ramps, or aircraft parking areas may cause conditions hazardous to aircraft safety. These uses shall be sited in accordance with the following criteria to achieve adequate separate between the attractant and aircraft movement:

i. A distance of 10,000 feet from any runways, loading ramps, or aircraft parking areas used or planned to be used by turbojet or turboprop aircraft.

ii. A distance of five (5) miles from any runways, loading ramps, or aircraft parking areas if the use places the runways and/or approach and departure patterns of the airfield between bird feeding, water or roosting areas.

5. *Split parcels*. For purposes of regulating parcels split by the MAZ lines, only that portion of a parcel that falls within the MAZ shall be subject to the conditions of the MAZ.

ZONE REGULATIONS

A. APZ 1 regulations. Areas within the APZ 1 overlay are subject to the following additional restrictions:

1. The following uses are prohibited:

    a. All residential uses

    b. Any non-residential uses that concentrate, within a structure on a regular basis, more than 25 people per acre. This limitation applies to: sports stadiums, amphitheaters, auditoriums, clubhouses, churches, schools, hospitals, assisted living and other medical facilities, hotels and motels, restaurants and other eating and drinking establishments and strip commercial centers built to such a scale that gatherings of more than 25 people per acre would be expected on a regular basis.

2. The following uses are permitted:

    a. Any non-residential use permitted in the underlying zoning district. All permitted uses must comply with the following development standards:

        I. Maximum building footprint shall be 8,000 square feet

        II. Maximum gross acreage lot coverage shall be 20%

III. Minimum side yard setback shall be 15 feet

B. APZ 2 regulations. Areas within the APZ 2 overlay are subject to the following additional restrictions:

1. The following uses are prohibited:

   a. All multi-family residential uses

   b. Manufactured home parks

   c. Any non-residential uses that concentrate, within a structure on a regular basis, more than 50 people per acre. This limitation applies to: sports stadiums, amphitheaters, auditoriums, clubhouses, churches, schools, hospitals, assisted living and other medical facilities, hotels and motels, restaurants and other eating and drinking establishments and strip commercial centers built to such a scale that gatherings of more than 50 people per acre would be expected on a regular basis.

2. The following uses are permitted:

   a. The maximum density of single-family residential uses shall not exceed one (1) unit per acre.

b. Any non-residential use permitted in the underlying zoning district. All permitted uses must comply with the following development standards:

   I. Maximum building footprint shall be 15,000 square feet

   II. Maximum gross acreage lot coverage shall be 35%

   III. Minimum side yard setback shall be 10 feet

Technical Appendix J.

Model Advisory/Coordinating Body Structure and Bylaws

BYLAWS AND OPERATING PROCEDURES
Naval Air Station Fort Worth, Joint Reserve Base Regional Coordination Committee

Adopted March 2008
Amended October 2015

STATEMENT OF PRINCIPLES

1. Naval Air Station Fort Worth, Joint Reserve Base is a vital national military asset that serves the operational needs of the United States Navy (as the host unit), United States Air Force, United States Army, United States Marine Corps, and the Texas Air National Guard.

2. Naval Air Station Fort Worth, Joint Reserve Base is home to thousands of Civilian, Reserve, Guard and full time military jobs.

3. Naval Air Station Fort Worth, Joint Reserve Base is required to be open and operational in order to maintain the adjacent presence of Lockheed Martin which employs thousands of civilians, in the manufacturing and testing of aircraft and aircraft technology.

4. Local leaders recognize that the mutual well being of the Naval Air Station Fort Worth, Joint Reserve Base and the surrounding communities is contingent upon cooperative strategic planning.

5. Land use near a military base can complement or compromise the utility and effectiveness of the installation and its mission.

6. Local leaders entered into a Joint Land Use Study committed to a fair and open process of examining land use and development issues around the installation; enhancing communication between the installation and the community; and implementing practical policies, programs, and projects geared to sustaining and enhancing the installation and the quality of life in the neighboring communities.

7. A resolution in support of the expansion of missions at Naval Air Station Fort Worth, Joint Reserve Base was adopted by the Joint Land Use Study Policy Committee on September 24, 2007. Similar resolutions were adopted by the surrounding entities in close proximity to the Naval Air Station Fort Worth, Joint Reserve Base.

DEFINITIONS

Section 1. The following definitions shall apply to terms used in these Bylaws and Operating Procedures:

A. Encroachment The Department of Defense defines "encroachment" as the cumulative result of any and all outside influences that inhibit normal military training and testing.

B. Joint Land Use Study The Joint Land Use Study (JLUS) was a cooperative planning initiative between the Naval Air Station Fort Worth, Joint Reserve Base, City of Benbrook, City of Fort Worth, City of Lake Worth, City of River Oaks, City of Westworth Village, City of White Settlement, and Tarrant County. The goal of the Joint Land Use Study was to promote compatible community growth that supports military training and operational missions. This inter-jurisdictional partnership resulted in the identification of actions that can be taken jointly by the community and installation to promote compatible development and address current and future encroachment.

C. Study Sponsor In the event of study or grant awards, the study sponsor is defined as the agency that administers the grant, performs coordinating activities related to the successful completion of the grant, maintains accountability for grant activities, and reports on activities associated with the grant. The North Central Texas Council of Governments has been selected to fulfill this role at the discretion of the Regional Coordination Committee.

D. Voting Entity A voting entity is defined as a city or county that:
   - Is located in close proximity to the Naval Air Station Fort Worth, Joint Reserve Base as described in Section 3, Section A "Membership," and

- Has expressed intent to participate in the Regional Coordination Committee by passing a resolution in support of the study and assigning voting representatives as described in Section 3, Section A, "Membership."
- Voting entities must be in good standing to cast votes. To maintain a "good standing" status, entities shall not be more than 90 days in arrears of required financial contributions.

ORGANIZATION

Section 2. Implementation efforts related to JLUS recommendations shall be overseen by the Naval Air Station Fort Worth, Joint Reserve Base Regional Coordination Committee (RCC).

A. RCC Purpose The RCC is comprised of local governments located in close proximity to the Naval Air Station Fort Worth, Joint Reserve Base. The RCC is charged with implementing land development recommendations, performing public outreach, and providing direction to staff. The RCC shall be the forum for the cooperative development of recommendations related to issues impacting the Naval Air Station Fort Worth, Joint Reserve Base.

NAVAL AIR STATION FORT WORTH, JOINT RESERVE BASE REGIONAL COORDINATION COMMITTEE

Section 3.The following rules shall govern the procedure, membership, and records of the Naval Air Station Fort Worth, Joint Reserve Base Regional Coordination Committee (RCC). In all other cases, the rules contained in the current edition of ***Robert's Rules of Order Newly Revised*** shall guide the RCC to which they are applicable and in which they are not inconsistent with these bylaws and any special rules of order the RCC may adopt.

A. Membership Membership on the RCC is open to the local governments in close proximity to the Naval Air Station Fort Worth, Joint Reserve Base listed here: City of Benbrook, City of Fort Worth, City of Lake Worth, Town of Lakeside, City of River Oaks, City of Sansom Park, Town of Westover Hills, City of Westworth Village, City of White Settlement, and Tarrant County. In order to become a voting entity, the governing body of the entity must pass a resolution supporting the Joint Land Use Study recommendations adopted by the JLUS Policy Committee

on September 24, 2007, and it must assign representatives to the RCC. Each voting entity shall be allotted two voting members that may vote on all matters of the RCC. The RCC voting members may vote to include the following organizations as Non-voting members: Department of Defense Office of Economic Adjustment, Naval Air Station Fort Worth, Joint Reserve Base, area Chambers of Commerce, Lockheed Martin, Independent School Districts, Economic Development Corporations, the North Central Texas Council of Governments, and other local, state, or federal agencies as appropriate.

B. Appointees Voting representatives of voting entities shall be appointed by and serve at the pleasure of their mayor, city councils, and/or Commissioners' Court. Each mayor, city council, and Commissioners' Court may appoint two members from their jurisdiction, including but not limited to; elected officials, an appointed member of another local government board, or a citizen representative of the applicable entity to serve on the RCC. The term of each assigned member will be determined by the appointing entity. Appointing authorities may appoint or delegate an alternate to attend and vote at a meeting for which their appointed member is not available. Delegate appointments shall be made to the Secretary or the Secretary's designee prior to the start of the meeting.

C. Standards of Conduct RCC (voting and non-voting) members shall not:

- Appear before the RCC while acting as an advocate for any other person, group, or business entity;
- Knowingly use their position on the RCC for their own private gain, or for the financial gain of their business;
- Engage in debate or vote on matters affecting a person, entity, or property in which that individual has a conflict of interest; or
- Accept or solicit any gift or favor that would tend to influence that individual in the discharge of official duties.

All RCC members must adhere to Chapter 171 of the Local Government Code and to the Code of Ethics from their respective local governments and public agencies.

D. Attendance Records of attendance of RCC meetings shall be kept and presented as part of each meeting summary. Entities with members that have missed at least three consecutive

meetings will be notified and the appointing bodies shall be asked to review the continued service of their representatives. Members shall notify the Committee Secretary or staff if they are unable to attend regular RCC meetings.

E. Quorum The quorum rule shall be: At least fifty-percent of all voting members must be present to conduct the business of the RCC. Once a quorum has been determined to exist, any business of the membership may be accomplished by a simple majority vote of the members making up the required quorum unless otherwise specified in these Bylaws.

F. Officers The RCC shall elect a Chair, Vice Chair, Secretary, and Treasurer for a term of two years. Regular elections shall be held in the first quarter of every odd calendar year, or at the first Committee meeting that takes place thereafter. Any appointed representative of a voting entity is eligible for officer positions. The Chair may rotate between various entities at the pleasure of the Committee. Chair, Vice Chair, Secretary, and Treasurer are considered for reelection every two years. No officer may serve more than two consecutive regularly-elected terms in any one position. The Chair shall preside over meetings of the RCC. When possible, and at the Chair's discretion, the Chair may be advised by the Immediate Past Chair throughout his or her tenure. In the event that the Immediate Past Chair is not re-appointed by his or her entity, at the Chair's discretion, he or she will serve as advisor for one two-year term in a non-voting capacity if they so desire.

G. Executive Committee The Executive Committee shall be comprised of the current Chair, Vice Chair, Secretary, Treasurer, and the Immediate Past Chair. In the event the Immediate Past Chair is not reappointed, the fifth Executive Committee member will be voted on by the RCC. The Executive Committee may be convened at the discretion of the Chair to seek consensus about RCC correspondence. The RCC will be briefed on Executive Committee actions at the regular RCC meetings.

H. Elections Regularly scheduled elections shall take place the first quarter of every odd calendar year. Special elections shall be held on an as-needed basis due to mid-term vacancies of any length of time. A vacancy in either the office of the Vice Chair, Secretary, or Treasurer shall be filled by the RCC by means of a special election in the first meeting of the Committee after the

vacancy becomes known. A nominating committee as appointed by the Chair shall provide at least one candidate for each position. Candidates shall be announced to the Committee in the meeting prior to scheduled elections. Write-in candidates are allowed during the scheduled elections. The incumbent officers shall preside over the entire meeting during which officer elections are held, with the newly elected officers beginning their duties at the conclusion of the meeting.

In the event that the offices of Chair, Vice Chair, Secretary, and Treasurer all become vacant, new officers shall be elected by means of a special election at the next regularly scheduled meeting of the RCC with nominations from the floor. In the event that the Chair of the RCC cannot continue to serve at any time during the term of election, the Vice Chair shall automatically become the Chair, and the Secretary shall automatically become Vice Chair. If an officer declines to fill a vacancy in these circumstances, a special election shall be held for the vacant position(s).

I. Meeting Schedule At least one meeting shall be held annually by the RCC, but the Committee shall meet as often as necessary for the purpose of transacting the business at hand. The Chair shall call the meeting and shall designate in the written notice of the meeting the business to be transacted or considered. Regular meetings shall be held on the third Monday of a month at 1:30 p.m., or as designated by the Committee, and will be hosted on a rotating basis by the voting entities.

J. Open Meetings Written notice of the meeting, accompanied by an agenda, shall be posted at least 72 hours prior to the meeting. All meetings shall be held as open meetings as defined in Chapter 551 of the Texas Government Code.

K. Meeting Summary Summaries of the meetings shall be kept and shall be submitted to the members of the RCC for approval.

L. Staff Support Staff support for the RCC shall be provided by the North Central Texas Council of Governments as long as they are able to provide this service. The RCC is able to contract for staff support as needed. Officers may assign administrative functions to the staff.

M. RCC Functions The function of the RCC shall be to review and vote on all matters related to implementation of the Joint Land Use Study recommendations surrounding the Naval Air Station Fort Worth, Joint Reserve Base in accordance with the RCC mission statement. This includes but is not limited to: providing direction to staff, implementing land development recommendations, and performing public outreach events.

INTENT

Section 4.These Bylaws and Operating Procedures are intended to provide rules and procedures to assure the orderly function of the Joint Land Use Study implementation surrounding the Naval Air Station Fort Worth, Joint Reserve Base.

ADOPTION

Section 5.These Bylaws and Operating Procedures shall be in full force and effect at such time as they have been approved by two-thirds vote of the RCC at a meeting at which a quorum, as defined herein, is present.

REVISION

Section 6.These Bylaws and Operating Procedures may be revised by approval of two-thirds of the members of the RCC at a meeting in which a quorum, as defined herein, is present. Changes in the Bylaws must be presented at one regularly scheduled meeting and voted on at a following regularly scheduled meeting. No Bylaw change shall be made that has not been presented at a previous meeting. The Chair shall vote on Bylaw changes.

Technical Appendix K.

Stormwater Management Memo

Prepared by Hayden Consultants, Inc.

Executive Summary

The purpose of this memo is to document current stormwater drainage conditions and develop stormwater management recommendations to address flooding impacts within the Farmers Branch Watershed. Analysis includes a review of previous studies, reports, and modeling, and a summary of ongoing stormwater management efforts within the region. This memo is a supporting element of the *Joining Forces* Regional Joint Land Use Study, which analyzes a range of potential issues, including flooding that could affect military operations at NAS Fort Worth JRB.

1. Description of Watershed

NAS Fort Worth JRB is bounded by Lake Worth to the north, the West Fork of the Trinity River on the east, and the Farmers Branch Watershed to the west (see **Appendix SW-A Vicinity/Location Map**). Farmers Branch Creek also flows east through the City of White Settlement, ultimately flowing into the West Fork of the Trinity River. The creek flows under the southern runways of the base airfield through two large culverts, which end at the Westworth Village golf course. Interstate 820 (IH 820) splits the watershed. The City of River Oaks is downstream of the base on the east side of the Trinity River.

Prior hydraulic modeling conducted by the U.S. Army Corps of Engineers (USACE) identified five main reaches in the Farmers Branch Watershed: MS-1, MS-2, MS-3, Las Vegas Trail (LVTrail), and West Trib. A reach describes the distance along a channel between cross sections. It is significant because it defines the length between left over bank, main channel, and right over bank. Rainfall over an extended period and area can cause creeks to overflow the banks and create overtopping conditions or flooding in surrounding areas.

With the current condition of the hydraulic structures in the Farmers Branch Watershed, most area roads overtop at the 2-year frequency[1] except for IH 820 and Dale Lane, which pass the 2-year event, and the Meadow Park Drive Bridge, which passes the 50-year flow (Q).

According to the USACE Section 205 – Local Flood Damage Report, the hydraulic structures in the watershed performed as follows:

- Nine structures in reach MS-1, with eight overtopping with the 2-year Q
- Two structures in MS-2, both overtopped by the 2-year Q
- Five structures in MS-3, with 3 overtopped with the 2-year Q
- Three structures in LVTrail Trib, all overtopped with the 2-year Q
- Four structures in West-Trib, with 2 overtopped with the 2-year Q

Note: (Using the USACE fully developed flow)

A typical roadway stream crossing should pass a minimum of the 2-year frequencies, while typical Texas Department of Transportation (TxDOT) criteria require passing a higher frequency based on the roadway classification. Local streets should pass the 10-25 year frequency, while highways, such as IH 820 should pass a minimum of 50-year frequency.

2. History and Background

The USACE completed an update to the original Federal Emergency Management Agency (FEMA) Hydrology and Hydraulics for the Farmers Branch Watershed in November of 2005 as part of a Section 205 report. The Section 205 Report can be found in **Attachment I-K.3**.

[1] The frequency otherwise known as Annual Exceedance Probability (AEP) is the probability that a given storm will occur in a given year, i.e. a 100 year frequency or 1% AEP, will have a 1 in 100 chance of occurring in any single year; likewise a 2 year frequency will have a 50% and will have a 1 in 2 chance of occurring in any single year. The higher the frequency the larger the rainfall amount as expressed in depth (inches).

The study focused on measures to reduce flooding along Farmers Branch Watershed as part of a National Economic Development Plan (NED). The findings indicated that Farmers Branch Creek experienced repetitive loss damages (50% Annual Exceedance Probability – "AEP") even during minor storm events (2-year frequency storm). The report identified several mitigation options, including replacement of bridge and culvert structures along the floodplain, detention ponds near IH 820, and widening of the existing channels. The study hydraulically modeled each of these options and prepared a cost benefit analysis (see **Appendix B, Table 2** Cost/Benefit of options from Section 205). The USACE determined that the project with the highest benefit relative to cost and reduction of flood risk was re-channelization and widening of a reach of Farmers Branch Creek between White Settlement Road, including a widening of LVTrail. The study designates this option as the Locally Preferred Plan (LPP). The project has since been constructed.

3. Existing Conditions

The climate in Fort Worth, Texas is generally mild with annual rainfall averages of 32.46 inches. The area is prone to flooding due to a high percentage of impervious surfaces in the watershed.

During a rain event, Farmers Branch Creek initially flows through the culverts. With increased discharge, the water had the potential to pool on the west side of the runway and eventually overtop the runway.

The community upstream of NAS Fort Worth JRB has also performed some channel reconstruction along the property line near White Settlement City Hall to reduce flooding. The channel was widened between Meadow Park Drive and White Settlement Road to a 90-foot bottom width and a 170-foot top width.

4. Prior Studies

FEMA/National Flood Insurance Program (NFIP) Coordination

The USACE performed a study of Farmers Branch Creek for FEMA as a part of Flood Insurance Study (FIS) number 48439C in 2009. The FIS hydrologic and hydraulic analyses for the FIS study of all streams within the City of White Settlement became effective in 1986. The stream reach study limits range from the confluence with the West Fork of the Trinity River downstream to 1,690 feet upstream of Little Fox Lane. NAS Fort Worth JRB is within this study limit. See **Appendix SW-C** for a map showing the 100-year FEMA floodplain with an aerial background. The full FEMA Flood Insurance Rate maps (FIRM) and Flood Insurance Study (FIS) report are in **Attachment I-K.2**.

Table 1 shows the hydrologic study values found within the FIS report. NAS Fort Worth JRB is downstream of the crossing of Grant Lane and upstream of the confluence with the West Fork Trinity River. The FEMA flows are significant since they reflect the amount of water placed in the channel, which determines the limits of the floodplain boundary and Base Flood Elevation (BFE), and in turn establishes flood risk for adjacent properties.

Table 1: Summary of FEMA Flows

Flooding Source and Location	Drainage Area	Peak Discharges			
		10% Annual Chance	2% Annual Chance	1% Annual Chance	0.2% Annual Chance
Farmers Branch					
at confluence with West Fork Trinity River	11.40	11,200	14,400	15,900	20,350
Upstream of confluence of Kings Branch	6.70	5,870	6,870	7,430	9,540
***At Grant Lane**	**5.14**	**5,010**	**6,450**	**7,100**	**8,540**
Approximately 420 feet upstream of Las Vegas Trail	3.69	4,990	6,740	7,510	9,450
Approximately 460 feet upstream of Las Vegas Trail	3.11	4,400	5,970	6,650	8,370
Approximately 50 feet upstream of Loop 820	3.02	1,090	1,440	1,600	2,000
Upstream of Redford Road	2.21	2,400	3,200	3,550	4,500
At Alemeda Boulevard	1.30	2,050	2,700	3,000	3,800
Approximately 50 feet upstream of Little Fox Lane	0.50	1,500	2,000	2,200	2,800

***Upstream of NAS Forth Worth JRB**

As a part of the the FIS study, Farmers Branch Creek was modelled hydraulicly in May 1991. The model analyzes the 10, 50, 100, and 500 year event based on surveyed topographic cross sections. These cross sections utilize differing roughness coefficients based on observations when the model was created. For the channel sections, a Manning's roughness coefficient[2] of 0.020 to 0.065 was used. For the overbanks, a roughness ranging from 0.040 to 0.80 was used, as the overbank typically has greater vegetation. See **Appendix SW-C** for the flood profile displaying the studied water surface elevation at the site of the NAS Fort Worth JRB.

USACE Section 205 – Local Flood Damage Report

Major flooding events have been recorded in 1984, 1989, and 2000. The flood in June 2000 resulted in flooding damages exceeding $2,000,000. Because of these flooding events, a detailed Section 205 Flood damage report was prepared. See **Attachment I-K.3**. The objectives of the study were to determine measures that can reduce the flooding along Farmers Branch Creek in White Settlement. The report did not evaluate potential improvements on the installation.

The planning team gathered the most current modeling for Farmers Branch Creek as part of this analysis, as well as portions of the Section 205 report containing the summary of options for various reaches.

The 205 hydrologic study evaluated the 6.8 square mile watershed contributing to the Farmers Branch Creek. The watershed was broken into 17 subbasins for analysis. As a part of the

[2] This is the friction factor between the water and the surface the water is flowing over. It comes from the Mannings Equation, which is used to model the volumetric flow rate in a channel or closed conduit. The higher the roughness factor the slower the water will travel measured in velocity in feet/second in a given stretch of channel.

analysis, land use of the watershed was updated to evaluate existing land use based on North Central Texas Council of Governments (NCTCOG) land use maps. The fully developed flows were created based on 2008 City of White Settlement and City of Fort Worth zoning maps.

Table 2: Comparison of FEMA vs the existing flows in the *Section 205

Flooding Source and Location	Drainage Area	FEMA 100 Year	Section 205 Existing Condition (June 2002)	Increase
	Square Miles (sq. mi.)	Cubic Feet per Second (cfs)	cfs	%
Farmers Branch at Grant Lane	5.14	7,100	9,530	34%
Farmers Branch at Kings Branch	6.7	7,430	10,340	39%

Table 3: Comparison of the existing and fully developed flows in the Section 205

Flooding Source and Location	Drainage Area	Section 205 Existing Condition	Section 205 Fully Developed Condition	Increase
	sq. mi.	cfs	cfs	%
Farmers Branch at Grant Lane	5.14	9,530	9,730	2%
Farmers Branch at Kings Branch	6.7	10,340	10,510	2%

*Section 205 refers to the hydraulic report prepared by the USCAE

The Section 205 study broke the main stem stream into five hydraulic regions: MS-1, MS-2, MS-3, LVTrail and West Trib. See location map in **Appendix SW-A**. The region affecting the NAS Fort Worth JRB is MS-1. Reach MS-1 begins just downstream of the base runways and extends to the confluence with the LVTrail tributary. MS-2 begins at the confluence with the LVTrail Tributary and ends at the confluence with the West Tributary. Lastly, MS-3 begins at the confluence with the West Tributary and ends at the crossing at highway IH 820, and reach LVTrail follows the North LVTrail road, and begins at Westpoint Boulevard, to the confluence at the intersection of Roland and the North LVTrail.

The report analyzed two detention options – a large basin between IH 820 and West Tributary and a medium basin between IH 820 and Dale Lane. The analysis determined that detention would have negative economic net benefits and, therefore, was not recommended.

The study was based on the original FEMA HEC-2 model created in 1984. The existing model was supplemented with 2-foot integral topographic aerial contours obtained from NCTCOG. The modeling approach was run utilizing a mixed flow regime mode to produce more accurate results. Multiple hydraulic alternatives were analyzed to provide flooding relief upstream of NAS Fort Worth JRB but none on the base. Other alternatives evaluated were structural modifications to existing culverts and detention basins along the main stem. Small, medium, and large trapezoidal channels were modelled with the fully developed flows with 3:1 side slopes and a 0.035 Manning's roughness value. Channel improvements were only upstream of White Settlement Road, as it was found that Water Surface Elevation (WSEL) is increased if channel improvements are applied downstream of White Settlement Road.

In addition, gabions[3] were modeled on LVTrailTrib since it has high erosive velocities. Results showed ponding upstream of structures at South Judd and Redford Lane and increased WSEL just upstream of each structure. The study concluded that the best configuration was the medium channel along Farmers Branch and LVTrailTrib called the LPP model. The consultant team used the LPP model as the base hydraulic model, which has a medium sized channel improvement along Farmers Branch and LVTrailTrib, as it provides the highest cost benefit ratio. See **Appendix SW-B, Table 2** - Cost/Benefit of Options from Section 205.

Adjacent Corridor Studies

Members of the public participating in outreach for the *Joining Forces* effort around NAS Fort Worth JRB identified drainage and flooding as a significant priority. Meeting attendees in particular noted flooding issues along the State Highway 183 corridor near Roberts Cut Off Road and along State Highway 199.

Previous NCTCOG corridor master plan efforts, specifically State Highway 183 (River Oaks Boulevard or SH 183) and State Highway 199 (Jacksboro Highway or SH 199) have assessed flooding issues related to Farmers Branch Watershed. The drainage assessment for the SH 199 Corridor Master Plan studied the corridor running northwest to southeast, just northeast of NAS Fort Worth JRB, along the banks of the West Fork of the Trinity River, and then crossing near the Panther Island Bypass Channel, and Clear Fork Trinity River. It identifies surface drainage along the SH 199 corridor as poorly defined with inadequate drainage collection, minimal storm drain inlets, and insufficient upstream and on-system capture areas, which may flood the roads. The study detailed 14 outfalls, which have varying capacity from <2-year frequency to 100-year frequency, and many of which contained silt. Two creeks were identified: the Menefee Creek (647 acres) – 5-year capacity and the WF-5 tributary (473 acres) – 2-year

[3] wire mesh boxes filled with rock used for stormwater conveyance

capacity. These creeks will see flooding during large events along SH 199 at the confluence of Menefee Creek and Stream WF-5, and where SH 199 crosses the unnamed creek. Three large bridges are along SH 199: West Fork of Trinity River, Panther Island Bypass Channel, and Clear Fork of Trinity River, which all convey the 100-year floods.

Comments collected from public meetings in River Oaks as part of *Joining Forces* indicate that several locations along SH 183 are also prone to flooding and that there are issues regarding the sizing of stormwater facilities. Currently, the corridor is characterized by wide swaths of impervious cover, consisting of roadway pavement and parking areas, which limit infiltration of stormwater and generate both high volumes of stormwater runoff and high loadings of stormwater pollutants. In addition, in certain locations, box culverts or storm sewers crossing under River Oaks Boulevard may be undersized, limiting the conveyance of water under the roadway and causing elevated water surface elevations on the upstream side of the roadway that may contribute to both roadway and structural flooding during severe rain events. Existing internal drainage along the corridor typically consists of incised roadside or median ditches, connected across intersections and driveways by culverts.

As a result, the SH 183 Corridor Master Plan recommended that immediate short-term solutions from the TxDOT would be necessary, including re-grading ditches and cleaning out culverts along the highway. Long-term solutions for flooding in River Oaks include a regional drainage and hydrology study and preliminary engineering to improved facilities.

5. Hydrologic Modeling of Farmers Branch Creek

Updated Conditions

The planning team conducted an independent analysis for the hydrology within the Farmers Branch Watershed to determine if flow has increased relative to the USACE Section 205 – Local Flood Damage Report based on the most recent land use maps.

See **Appendix SW-D.1** for the drainage area map for the analysis, which splits Farmers Branch into 18 sub-basins. The map uses the latest Digital Elevation Model (DEM) information, downloaded from the TINRIS.org website. The background of the map shows the United States Geological Survey (USGS) contour elevation layer.

See **Appendix SW-D.2** for the 2014 land use map. The NCTCOG 2014 land use dataset shows that the Farmers Branch Watershed consists of 1/4-acre residential, 1/8-acre residential, industrial, commercial/business, streets and road, and open space land uses. The NAS Fort Worth JRB runways are included as an industrial and street and road land use category.

Appendix SW-D.3 shows the United States Department of Agriculture Natural Resources Conservation Service soil groups associated with the Farmers Branch Watershed. The predominate group is Type D Soil, consisting of impervious and expansive clays. Within the channels a Goodland formation limestone is evident due to erosion the steep slopes and high velocities throughout the reaches.

The planning team developed an independent hydrologic analysis of the Farmers Branch Watershed incorporating 2014 future land use for Fort Worth and White Settlement to enable comparison with Section 205 flows. **Table 4** shows the amount of water in cubic feet per second (cfs) for a given storm frequency based on the updated land use. The comparison of flows between the Section 205 study and the current analysis is shown in **Appendix SW-D.4,**

Table 6. The comparison shows that the updated hydrology is very close to the flows originally calculated for the future development, and overall slightly lower, with flows tending to converge as the storm frequency increases. The results validate the modeling conducted as part of the USACE Section 205 – Local Flood Damage Report.

Table 4: Updated Drainage Area Flow Analysis

Drainage Area	Flow (cfs)						
	002YR	005YR	010YR	025YR	050YR	100YR	500YR
DA-001	171.00	195.80	218.60	261.40	287.80	314.10	382.80
DA-002	1,975.70	2,421.10	2,746.10	3,326.00	3,694.10	4,056.80	4,869.50
DA-003	297.10	372.30	425.80	518.40	577.50	635.50	759.60
DA-004	155.90	188.60	214.00	259.40	288.40	316.90	378.80
DA-005	834.70	1,026.40	1,169.20	1,420.40	1,580.80	1,738.30	2,077.30
DA-006	348.00	420.70	477.70	579.30	644.20	707.90	845.60
DA-007	319.70	389.90	444.70	541.00	602.70	663.20	789.40
DA-008	481.00	599.90	687.90	839.10	936.00	1,030.90	1,227.90
DA-009	519.60	625.90	704.70	849.50	940.80	1,031.00	1,243.60
DA-010	131.50	156.40	175.60	211.30	233.70	255.80	310.70
DA-011	335.30	403.00	453.50	546.30	604.70	662.40	800.80
DA-012	109.40	128.90	144.60	173.80	192.10	210.20	255.10
DA-013	155.80	190.10	215.10	260.20	288.80	317.00	381.20
DA-014	138.30	182.20	212.70	268.20	303.60	338.40	413.90
DA-015	886.90	1,021.70	1,143.10	1,370.70	1,512.50	1,653.40	2,006.80
DA-016	207.10	249.70	283.10	343.20	381.50	419.10	500.90
DA-017	392.70	479.70	546.20	663.30	738.20	811.70	969.40
DA-018	554.10	697.10	807.80	990.90	1,110.10	1,226.20	1,458.70

Farmers Branch Creek has a total of 19 existing structures. Farmers Branch, LVTrail, and West Trib are the major channels, with Manning's roughness (velocity) values ranging from 0.04 to 0.08 for Farmers Branch. Farmers Branch has a contributing area of 6.8 acres. Farmers Branch includes economic damage reaches FB-1, FB-2, FB-3, FB-4, and FB-7, while LVTrailTrib and West Trib include economic damage reaches FB-5 and FB-6, respectively. High erosive velocities are seen upstream of Old Railroad Bridge crossing, the South Judd Street, Redford Lane, and Dale Court Lane culvert crossings. See **Appendix SW-E** for an exhibit on the economic damage reaches. Economic damage reaches reflect the results of Flood Damage Analysis, which integrates hydrologic, hydraulic, and floodplain characteristics with expected annual damages to strictures due to a flooding event.

6. Watershed Strategies

In addition to analyzing physical infrastructure capacities in areas surrounding NAS Fort Worth JRB, this memo identifies planning and development strategies for implementation within the broader watershed and region. Regulatory tools and best management practices (BMPs), such as Low Impact Development (LID) can both play a major role in reducing flooding risks.

The NCTCOG hosted a Countywide Watershed Management Roundtable in March 2017 to provide information about the importance of understanding flood risk, concepts such as freeboard, and floodplain management. Nine counties in North Central Texas participated in the Roundtable survey of local floodplain management practices (Collin, Dallas, Denton, Ellis, Kaufman, Navarro, Palo Pinto, Tarrant, and Wise). See **Attachment I-K.4** for discussion materials.

Regulatory Requirements

Floodplain management is a critical step in reducing flood damage to surrounding residential areas. FEMA maps determine the flood risk for a given area based on engineering studies and BFE. The BFE represents the height to which flood waters are anticipated to rise and it is the regulatory basis for flood-proofing structures. Areas that have a one percent chance of being inundated by flood waters in any given year are designated as a Special Flood Hazard Area (SFHA). The SFHA designation requires regulation of development in or near flood prone areas and flood insurance.

Within these areas, freeboard is a critical concept. Freeboard is the vertical distance between the flood level and the crest of a waterway bank, dam or embankment, the underside of a bridge, or floor of a building. In these areas, codes require at least one foot of freeboard. Stronger regulatory policies call for freeboard in excess of one foot. Higher freeboard compensates for unknown factors, such as increased urbanization in the watershed that could contribute to higher than calculated flood heights. Stronger regulatory policies, therefore, would contain higher freeboard requirements.

BMP Implementation

Structural stormwater controls are facilities designed to treat stormwater runoff and/or mitigate the effects of increased stormwater runoff peak rate, volume, and velocity due to urbanization. The focus of such systems is water quantity control and flood prevention and/or mitigation.

LID goes beyond designing systems to convey certain quantities of water to techniques that maintain a site's ability to filter, store, evaporate, and detain runoff close to its source. Instead

of conveying stormwater in large end-of-pipe facilities at the bottom of drainage areas, LID addresses stormwater through small, cost-effective landscape features at the site level.

One of the primary objectives of LID site design is to preserve as much as possible a site's pre-development hydrologic functions by infiltrating and temporarily storing runoff water. LID techniques include:

- Bioretention, which consists of a grass buffer strip, sand bed, or ponding area that collects and treats stormwater
- Green roofs, also known as vegetated roof covers that filters, absorbs, and/or detains rainfall
- Permeable paving materials that allow rainwater to infiltrate the ground and reduce the runoff leaving a site
- Constructed stormwater wetlands, which are manmade shallow-water ecosystems designed to treat and store stormwater runoff
- Vegetated swales, which are used to convey and treat stormwater runoff from parking lots, roadways, and residential and commercial developments

iSWM™ stands for *integrated* Stormwater Management. The iSWM™ Program for Construction and Development is a cooperative initiative that assists cities and counties to achieve the goals of water quality protection, streambank protection, and flood mitigation, while also helping communities to meet their construction and post-construction obligations under state stormwater permits.[4] The iSWM™ program consists of four parts: Criteria Manual, Technical Manual, Tools, and program guidance.

[4] www.iswm.nctcog.org

iSWM™ promotes the most comprehensive approach to stormwater management by linking stormwater planning with informed land use and transportation decisions. This framework recommends that planning take place at both the watershed and smaller sub-watershed scales. While traditional stormwater management emphasizes techniques, such as peak discharge control, volume reduction, groundwater recharge, channel protection, and flood protection watershed based planning promotes a broader range of goals, including streambank and stream corridor restoration, habitat protection, protection of historical and cultural resources, enhancement of recreational opportunities, and community design.

The tools of watershed management include:

- Zoning and land use planning
- Land acquisition and land conservation
- Riparian buffers and greenways
- Site design practices (LID techniques)
- Structural stormwater controls
- Site erosion and sediment control
- Elimination of non-stormwater discharges
- Watershed stewardship

Conclusion

Historically, poor drainage has produced localized flooding in surrounding communities. Prior modeling indicated that the culverts beneath the NAS Fort Worth JRB runway were undersized relative to flow. Stakeholders at the base have indicated that the placement of storm drains in strategic locations has largely mitigated previous flooding issues. Additionally, recent improvements such as channel reconstruction have reduced flood events in the White

Settlement area. NAS Fort Worth JRB has confirmed that there are no currently no significant, or recurring, flooding concerns within the fence line.

While NAS Fort Worth JRB and surrounding areas have been able to reduce flooding, a regional emphasis on stormwater management is necessary to maintain manageable rates of stormwater flow as development in the watershed continues, and to ensure the effective function of current stormwater infrastructure. Substantial increases in future stormwater flow and any degrading of the capacity of the stormwater system could generate new flooding risks at the base or affect access and safety due to flooding in surrounding areas.

This memo identifies the following planning, infrastructure, and maintenance related strategies to provide adequate, ongoing management of stormwater and promote the overall health of the region's watershed.

- Strengthen awareness and promote the implementation of iSWM™ strategies and LID techniques to reduce flooding risks across the watershed
  - Conduct community outreach on the effects of additional impervious areas on stormwater quality and quantity
  - Connect communities and private sector developers with informational resources on iSWM™ and LID techniques
  - Develop an outline for a Stormwater Master Plan utilizing iSWM™ and LID components for use by city and county governments
  - Highlight regional best practice examples of iSWM™/LID techniques
  - Encourage creation of stream buffers, the preservation of open space, and limitations on clearing and grading to enhance natural drainage functions
  - Build on the efforts of the Countywide Watershed Management Roundtable to facilitate continued regional dialogue on stormwater issues and strategies

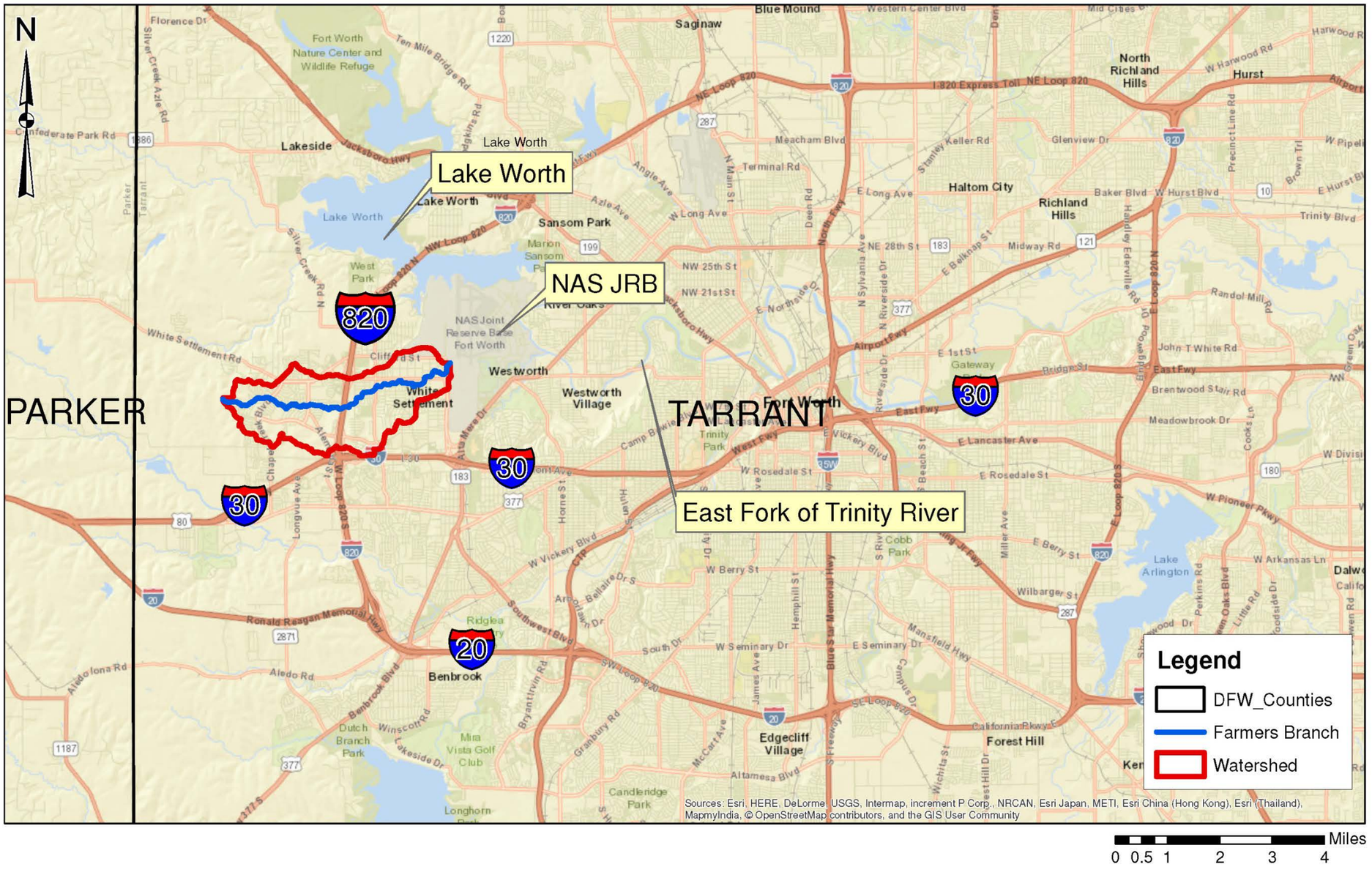
- Enforce NFIP Regulations for the Farmers Branch Watershed to establish freeboard requirements above FEMA BFE
  - Require developments to file a Letter of Map Revision (LOMR) if a project effects the established FEMA BFE
- Increase the capacity and function of existing stormwater infrastructure through the re-grading of ditches and cleaning out culverts along highway corridors and the implementation of engineering improvements in storm drain inlets and upstream and on-system capture areas
  - Clearly define ongoing operation and maintenance responsibilities
  - Additional HH modeling will determine the appropriate sizing of the storm drain infrastructure, which can be put into an overall storm-water masterplan. The City of Fort Worth and White Settlement will need to work together on develop a Capital Improvement Plan, that will identify areas that need improvement since they both are effected by the Farmer's Branch Watershed. The plan should include improvement to streets and roads to increase the size of crossing structures, upgrading the size of storm drain systems, as well as identifying areas of re-occurring flooding, which may need to be bought out and kept as floodplain land use by restricting development.
  - The existing road in the watershed, will need to be up-sized to prevent overtopping. The new culverts or bridges will need to meet a higher frequency storm event based on their functionality; local cross-streets will use a lower 5 to 10-year frequency, while highways such as IH 820 should be able to pass the 50 to 100 year frequencies.
  - It is not clear if White Settlement has adopted a stormwater program to address these flooding issues, whereas the City of Forth Worth on the west side of IH 820 within the Farmer's Branch Watershed has a very active Stormwater management

(http://fortworthtexas.gov/stormwater/) to address floodplains, system maintenance, flood insurance, management and regulations, flood safety, flood warning systems, and lot grading. Additionally, the City of Fort Worth adopted an iSWM™ program.

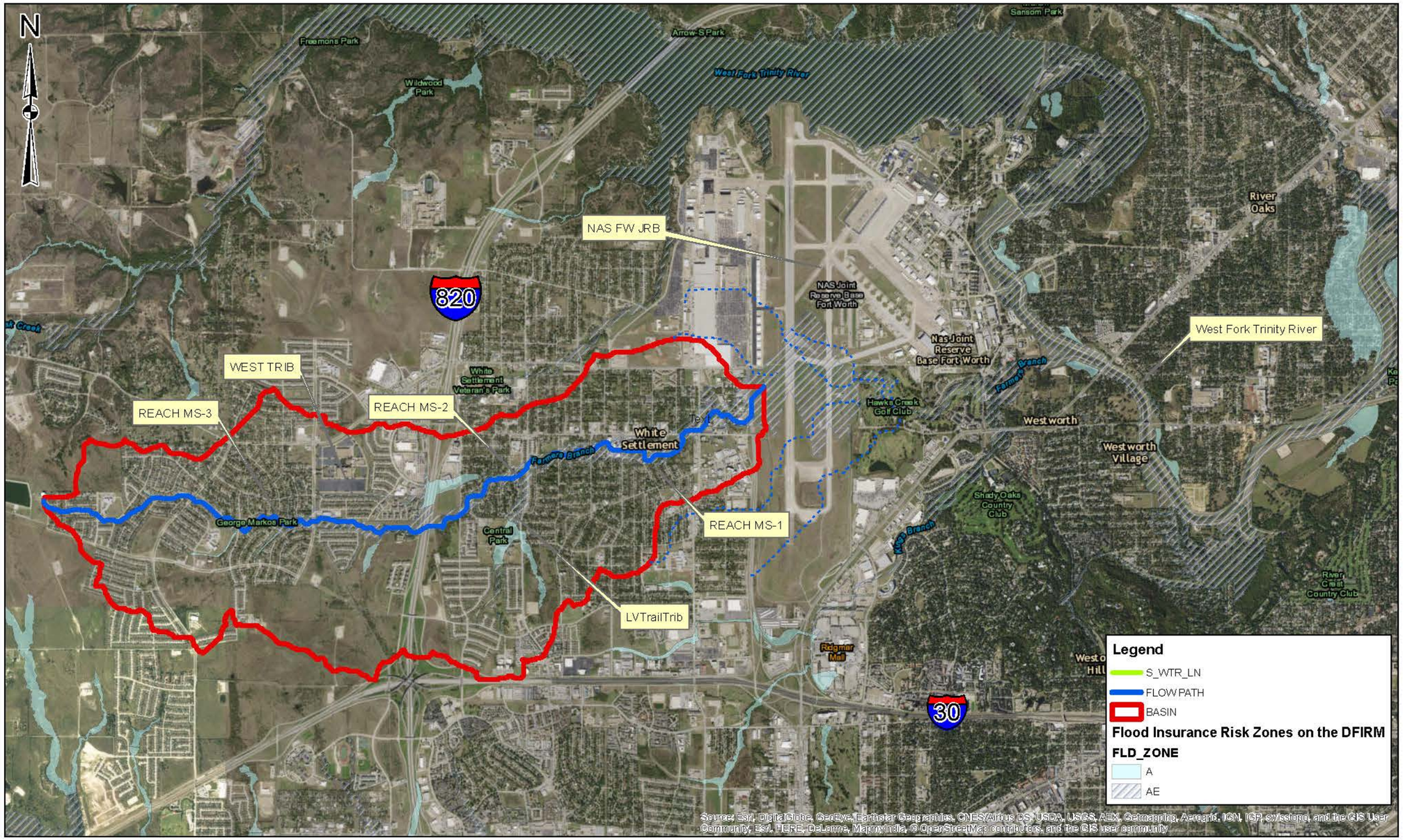
- Enhance erosion control to assist in maintaining the function and capacity of stormwater infrastructure through the use of measures, including:
  - Drop structures
  - Baffle blocks
  - Rock riprap downstream of culverts and bridge abutments
  - Concrete line ditches
- Conduct a detailed hydrology and hydraulic study for the Farmers Branch Watershed within the City of While Settlement
  - Incorporate best available information from Light Detection and Ranging (LIDAR) data and new survey for channels and bridge, culverts and storm drains, overtopping elevations, gutters, flowlines and pipe inverts
  - Use the analysis to set higher design standards for state and city facilities, including providing freeboard at roadway crossings
- Maintain pre-development site runoff levels through the use of strategies, including:
  - Detention ponds or underground storage
  - Vegetated swales
  - Rain gardens
  - Re-routing of storm drain systems
  - Maintenance of green space
  - Buyout of properties in floodplains

Appendix SW-A – Vicinity/Location Map

Vicinity Map



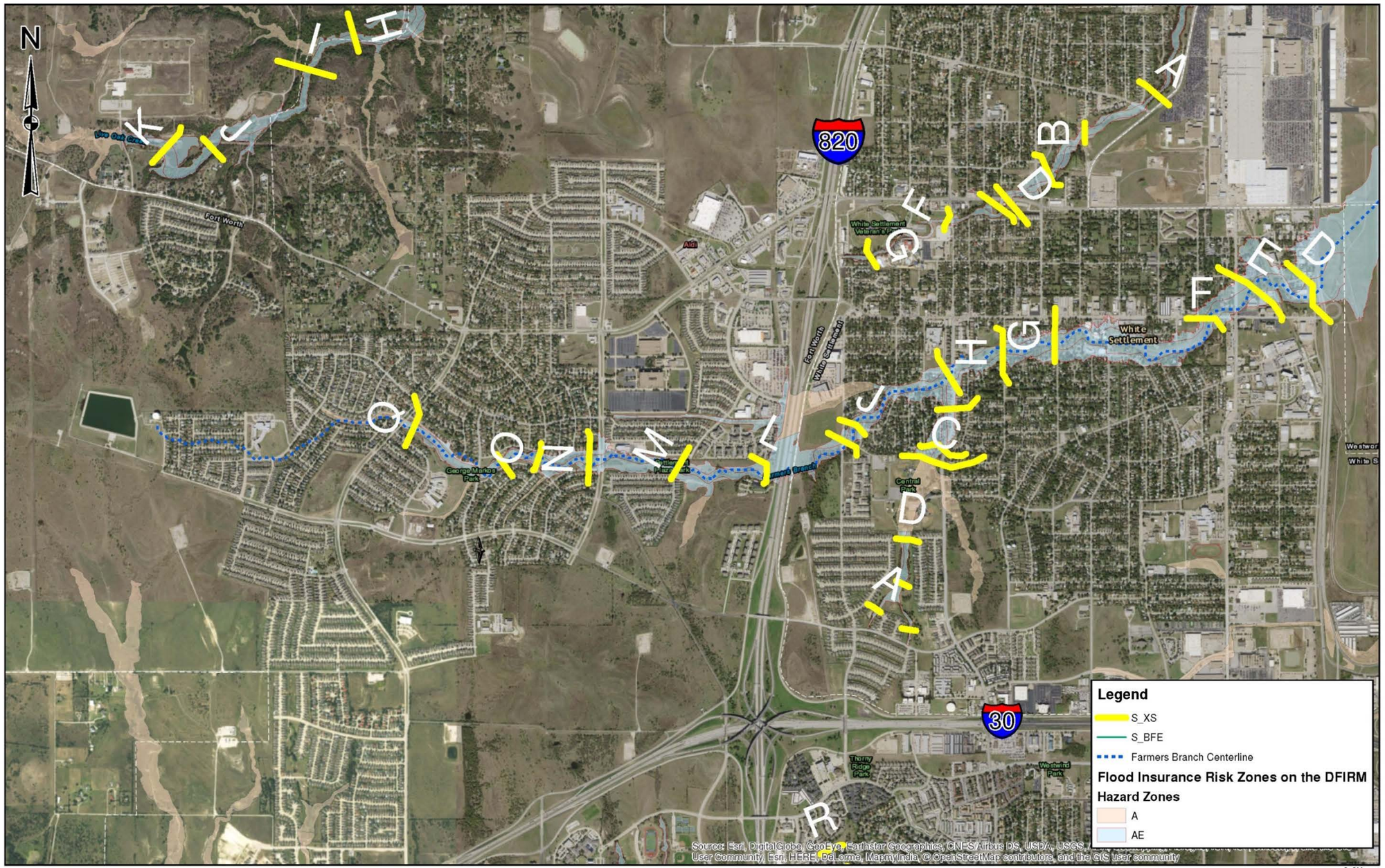
LOCATION MAP - FARMERS BRANCH WATERSHED

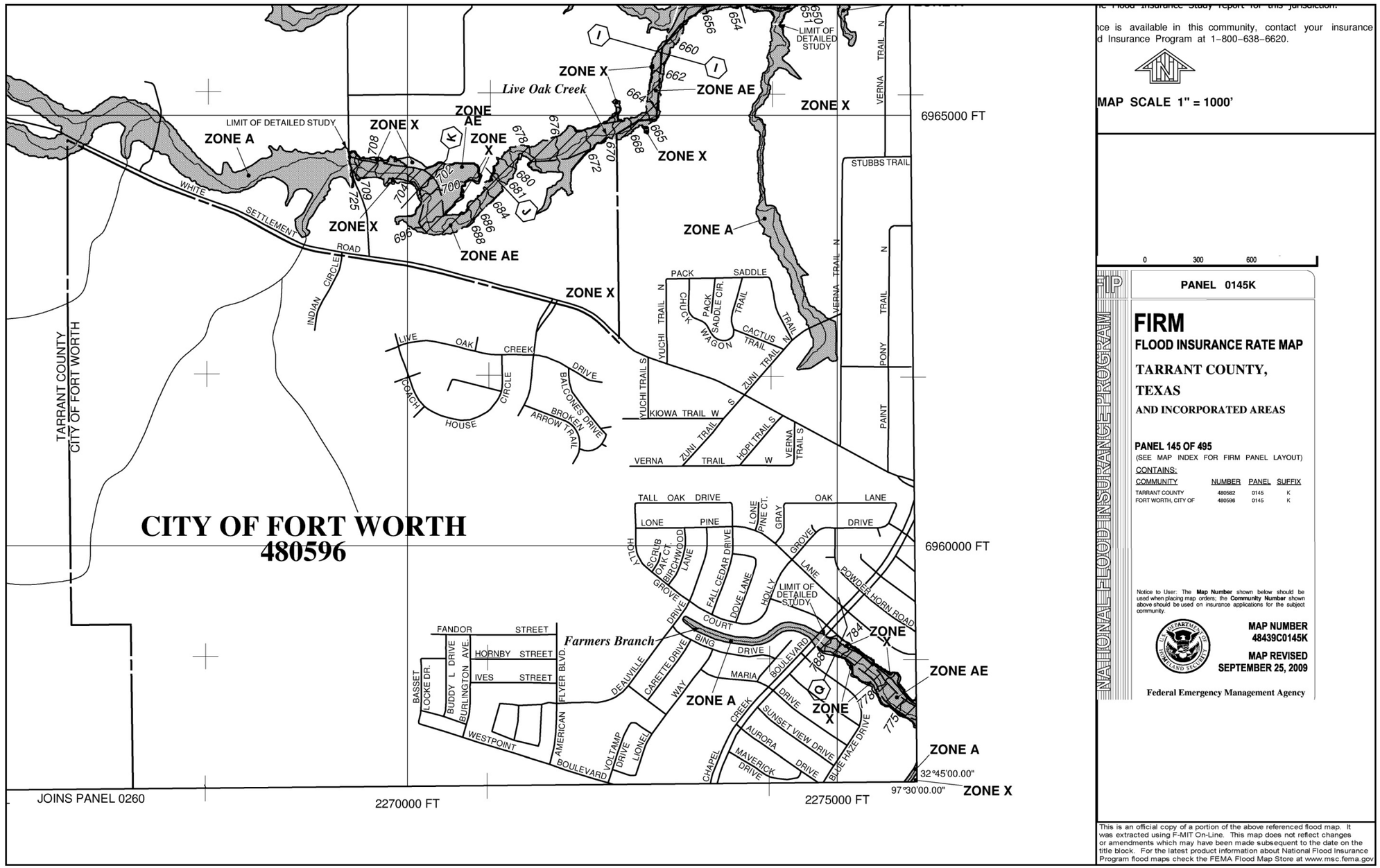


Appendix SW-B – Cost/Benefit of Options from Section 205

Appendix SW-C – FEMA Maps and FIS Profiles

FEMA 100YR FLOODPLAIN MAP





ce is available in this community, contact your insurance
d Insurance Program at 1-800-638-6620.

MAP SCALE 1" = 1000'

0 300 600

PANEL 0145K

FIRM

FLOOD INSURANCE RATE MAP

TARRANT COUNTY, TEXAS

AND INCORPORATED AREAS

PANEL 145 OF 495

(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
TARRANT COUNTY	480582	0145	K
FORT WORTH, CITY OF	480596	0145	K

Notice to User: The **Map Number** shown below should be used when placing map orders; the **Community Number** shown above should be used on insurance applications for the subject community.

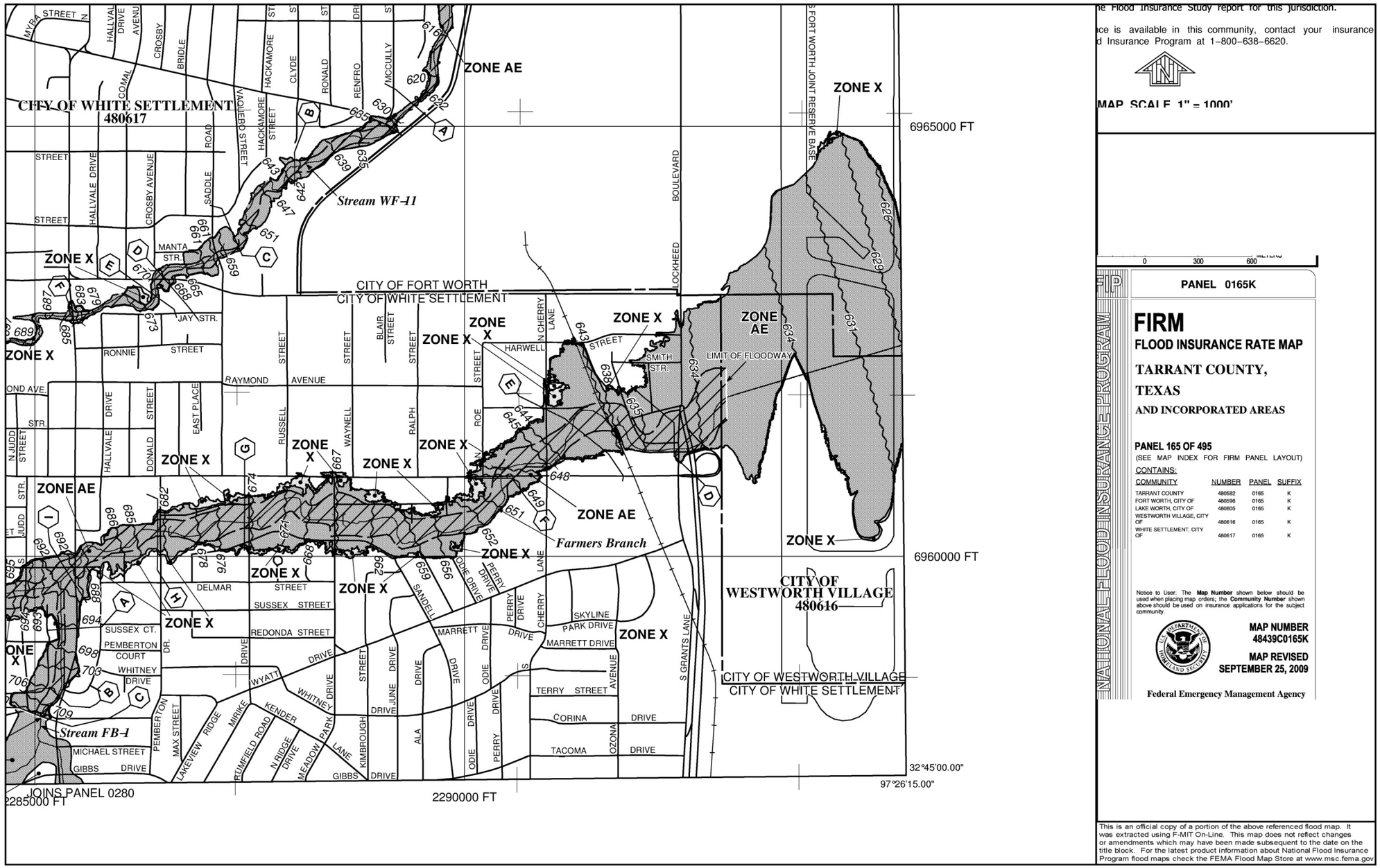
MAP NUMBER
48439C0145K

MAP REVISED
SEPTEMBER 25, 2009

Federal Emergency Management Agency

NATIONAL FLOOD INSURANCE PROGRAM

This is an official copy of a portion of the above referenced flood map. It was extracted using F-MIT On-Line. This map does not reflect changes or amendments which may have been made subsequent to the date on the title block. For the latest product information about National Flood Insurance Program flood maps check the FEMA Flood Map Store at www.msc.fema.gov


CITY OF WHITE SETTLEMENT
480617
ZONE AE
ZONE X
6965000 FT
Stream WF-11
CITY OF FORT WORTH
CITY OF WHITE SETTLEMENT
ZONE X
ZONE AE
LIMIT OF FLOODWAY
ZONE X
ZONE AE
Farmers Branch
ZONE X
6960000 FT
CITY OF
WESTWORTH VILLAGE
480616
CITY OF WESTWORTH VILLAGE
CITY OF WHITE SETTLEMENT
Stream FB-1
JOINS PANEL 0280
2285000 FT
2290000 FT
32°45'00.00"
97°26'15.00"
MAP SCALE 1" = 1000'
PANEL 0165K
FIRM
FLOOD INSURANCE RATE MAP
TARRANT COUNTY,
TEXAS
AND INCORPORATED AREAS
PANEL 165 OF 495
(SEE MAP INDEX FOR FIRM PANEL LAYOUT)
CONTAINS:
COMMUNITY NUMBER PANEL SUFFIX
TARRANT COUNTY 480582 0165 K
FORT WORTH, CITY OF 480596 0165 K
LAKE WORTH, CITY OF 480605 0165 K
WESTWORTH VILLAGE, CITY OF 480616 0165 K
WHITE SETTLEMENT, CITY OF 480617 0165 K
Notice to User: The Map Number shown below should be used when placing map orders; the Community Number shown above should be used on insurance applications for the subject community.
MAP NUMBER
48439C0165K
MAP REVISED
SEPTEMBER 25, 2009
Federal Emergency Management Agency
NATIONAL FLOOD INSURANCE PROGRAM
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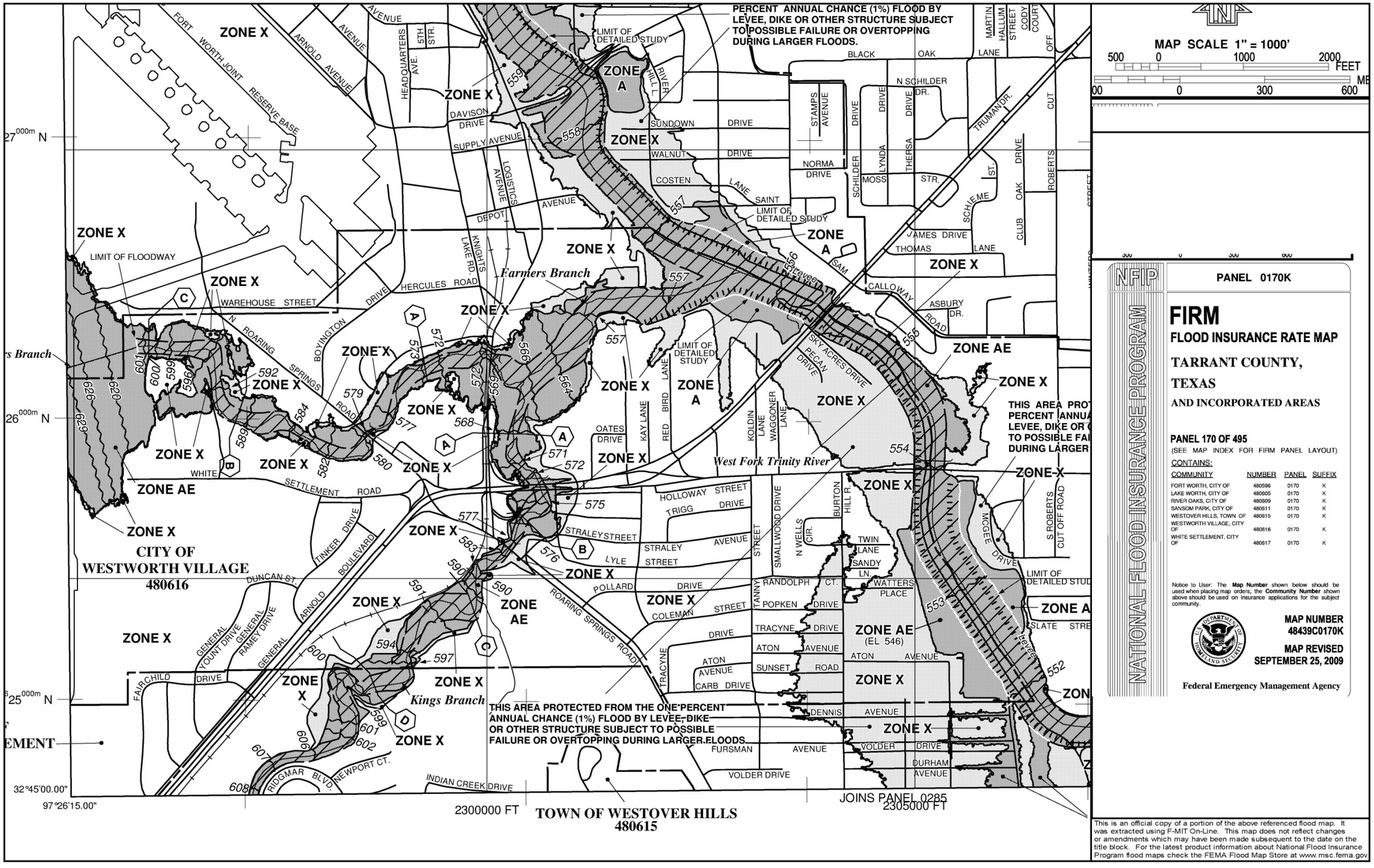
PERCENT ANNUAL CHANCE (1%) FLOOD BY LEVEE, DIKE OR OTHER STRUCTURE SUBJECT TO POSSIBLE FAILURE OR OVERTOPPING DURING LARGER FLOODS.
MAP SCALE 1" = 1000'
500 0 1000 2000 FEET
00 0 300 600
NFIP
PANEL 0170K
FIRM
FLOOD INSURANCE RATE MAP
TARRANT COUNTY, TEXAS
AND INCORPORATED AREAS
PANEL 170 OF 495
(SEE MAP INDEX FOR FIRM PANEL LAYOUT)
CONTAINS:
COMMUNITY NUMBER PANEL SUFFIX
FORT WORTH, CITY OF 480596 0170 K
LAKE WORTH, CITY OF 480605 0170 K
RIVER OAKS, CITY OF 480609 0170 K
SANSOM PARK, CITY OF 480611 0170 K
WESTOVER HILLS, TOWN OF 480615 0170 K
WESTWORTH VILLAGE, CITY OF 480616 0170 K
WHITE SETTLEMENT, CITY OF 480617 0170 K
Notice to User: The Map Number shown below should be used when placing map orders; the Community Number shown above should be used on insurance applications for the subject community.
MAP NUMBER
48439C0170K
MAP REVISED
SEPTEMBER 25, 2009
Federal Emergency Management Agency
NATIONAL FLOOD INSURANCE PROGRAM
ZONE X
ZONE A
ZONE AE
LIMIT OF FLOODWAY
LIMIT OF DETAILED STUDY
Farmers Branch
Kings Branch
West Fork Trinity River
CITY OF WESTWORTH VILLAGE
480616
TOWN OF WESTOVER HILLS
480615
THIS AREA PROTECTED FROM THE ONE-PERCENT ANNUAL CHANCE (1%) FLOOD BY LEVEE, DIKE OR OTHER STRUCTURE SUBJECT TO POSSIBLE FAILURE OR OVERTOPPING DURING LARGER FLOODS
JOINS PANEL 0285
2300000 FT
2305000 FT
32°45'00.00"
97°26'15.00"
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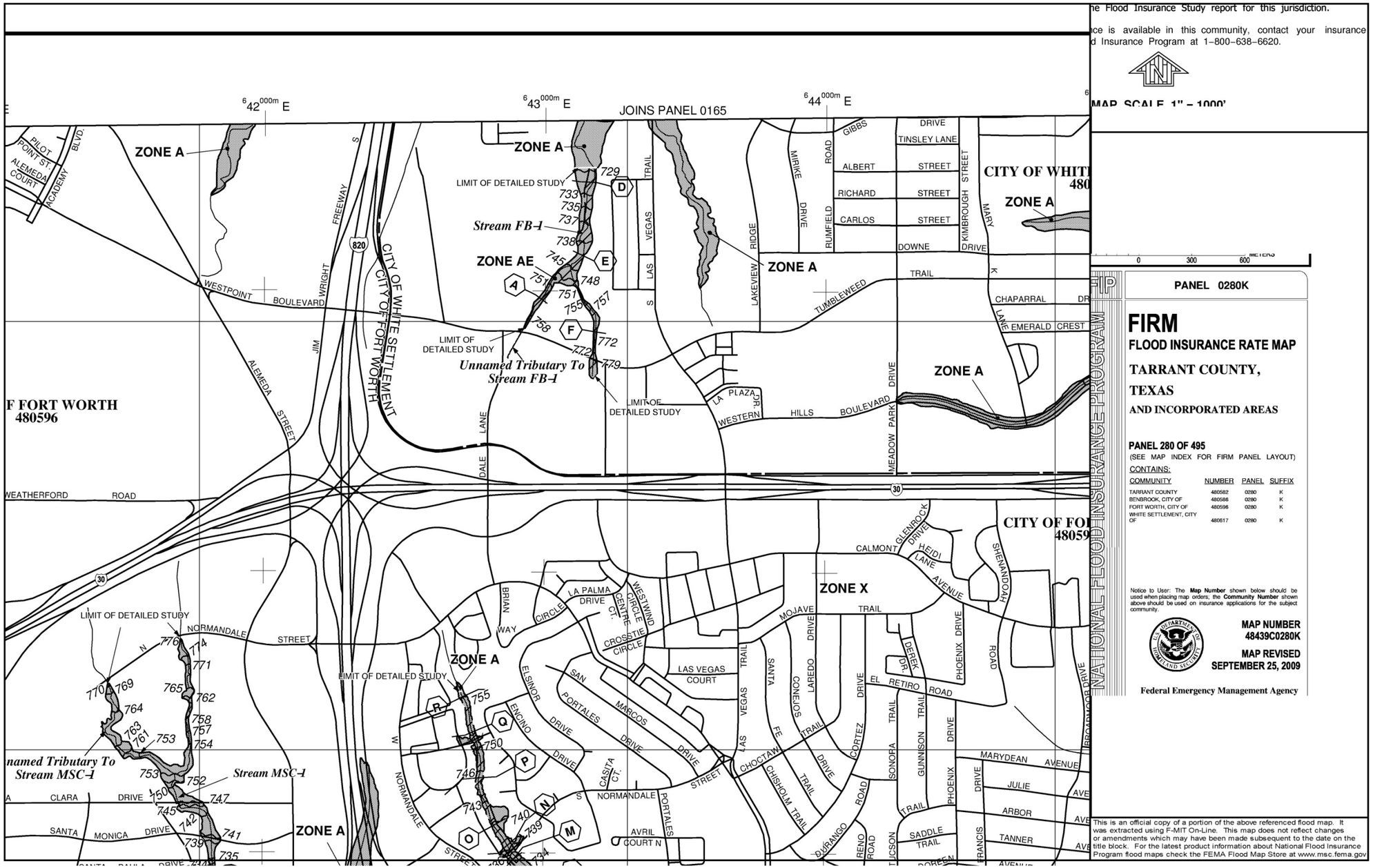
JOINS PANEL 0165
ZONE A
ZONE AE
ZONE X
LIMIT OF DETAILED STUDY
Stream FB-1
Unnamed Tributary To Stream FB-1
Stream MSC-1
Unnamed Tributary To Stream MSC-1
CITY OF WHITE SETTLEMENT
CITY OF FORT WORTH
F FORT WORTH
480596
CITY OF WHIT
480
CITY OF FOR
48059
WESTPOINT BOULEVARD
WEATHERFORD ROAD
NORMANDALE STREET
LA PALMA DRIVE
CALMONT AVENUE
MARYDEAN AVENUE
LAS VEGAS COURT
AVRIL COURT N
PILOT POINT ST.
ALEMEDA COURT
ACADEMY BLVD.
JIM WRIGHT FREEWAY S
ALEMEDA STREET
LAKEVIEW RIDGE
TUMBLEWEED TRAIL
CHAPARRAL LANE
EMERALD CREST DR
LA PLAZA DR
WESTERN HILLS BOULEVARD
MEADOW PARK DRIVE
GIBBS DRIVE
TINSLEY LANE
ALBERT STREET
RICHARD STREET
CARLOS STREET
DOWNE DRIVE
MIRIKE DRIVE
RUMFIELD ROAD
KIMBROUGH STREET
MARY K
VEGAS TRAIL
LAS VEGAS TRAIL S
BRIAN WAY
CIRCLE
CENTRE CT.
WESTMIND CIRCLE
CROSSTIE CIRCLE
ELSINOR
ENCINO DRIVE
SAN PORTALES DRIVE
MARCOS DRIVE
CASITA CT.
SANTA FE TRAIL
LAREDO DRIVE
SONORA TRAIL
CHOCTAW TRAIL
CHISHOLM TRAIL
CORTEZ DRIVE
DEBBIE DR.
PHOENIX DRIVE
EL RETIRO ROAD
GUNNISON TRAIL
JULIE AVE
ARBOR AVE
TANNER AVE
SADDLE TRAIL
GLENROCK DRIVE
HEIDI LANE
SHENANDOAH AVENUE
BROADMOOR DRIVE
SANTA CLARA DRIVE
SANTA MONICA DRIVE
SANTA PAULA DRIVE
DURANGO DRIVE
RENO ROAD
TUCSON TRAIL
FRANCIS AVENUE
820
30
0 300 600 METERS
PANEL 0280K
FIRM
FLOOD INSURANCE RATE MAP
TARRANT COUNTY, TEXAS
AND INCORPORATED AREAS
PANEL 280 OF 495
(SEE MAP INDEX FOR FIRM PANEL LAYOUT)
CONTAINS:
COMMUNITY NUMBER PANEL SUFFIX
TARRANT COUNTY 480582 0280 K
BENBROOK, CITY OF 480586 0280 K
FORT WORTH, CITY OF 480596 0280 K
WHITE SETTLEMENT, CITY OF 480617 0280 K
Notice to User: The Map Number shown below should be used when placing map orders; the Community Number shown above should be used on insurance applications for the subject community.
MAP NUMBER
48439C0280K
MAP REVISED
SEPTEMBER 25, 2009
Federal Emergency Management Agency
NATIONAL FLOOD INSURANCE PROGRAM
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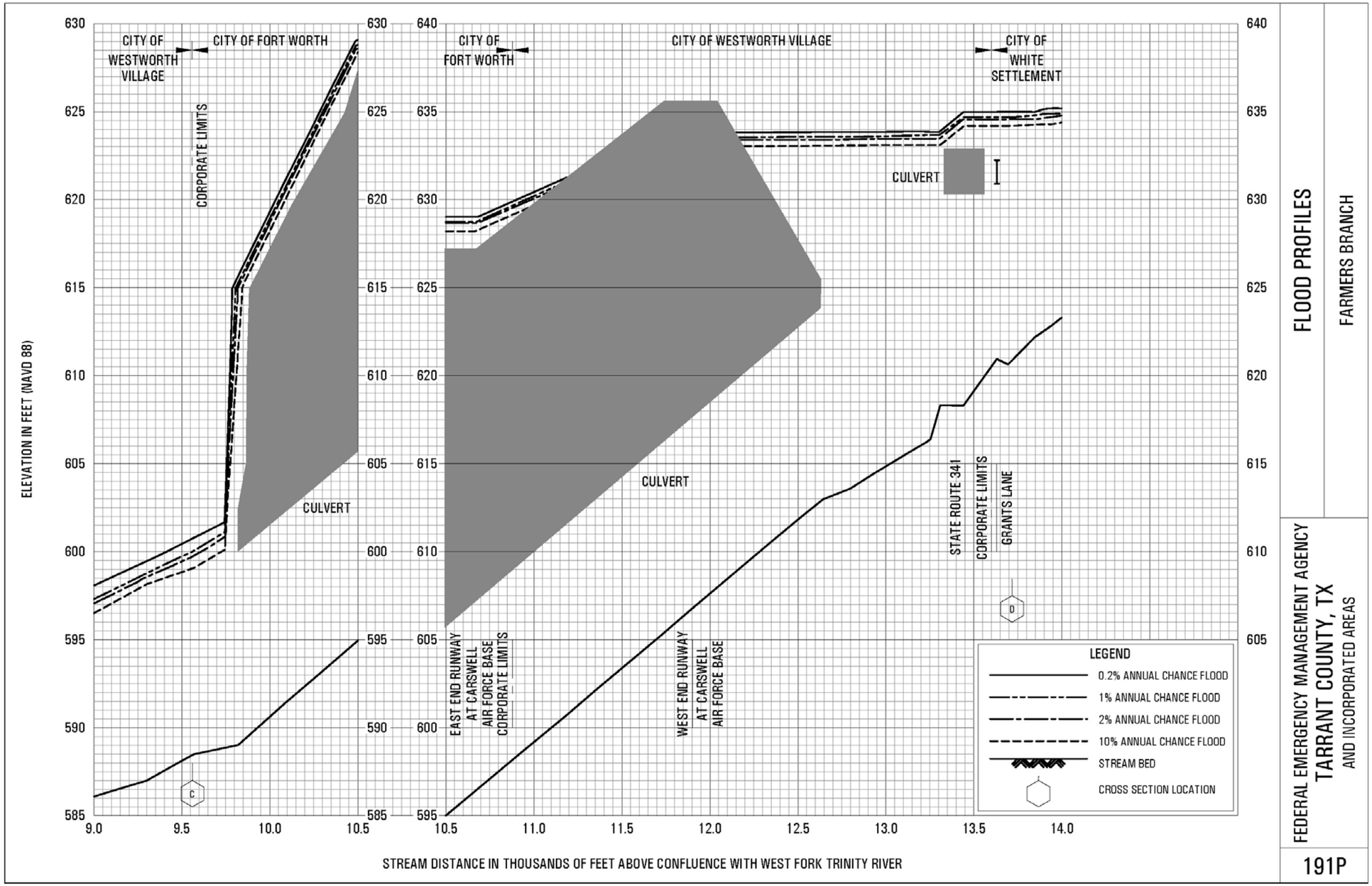

CITY OF WESTWORTH VILLAGE
CITY OF FORT WORTH
CORPORATE LIMITS
CULVERT
CITY OF FORT WORTH
CITY OF WESTWORTH VILLAGE
CITY OF WHITE SETTLEMENT
CULVERT
CULVERT
EAST END RUNWAY AT CARSWELL AIR FORCE BASE
CORPORATE LIMITS
WEST END RUNWAY AT CARSWELL AIR FORCE BASE
STATE ROUTE 341
CORPORATE LIMITS
GRANTS LANE
C
D
LEGEND
0.2% ANNUAL CHANCE FLOOD
1% ANNUAL CHANCE FLOOD
2% ANNUAL CHANCE FLOOD
10% ANNUAL CHANCE FLOOD
STREAM BED
CROSS SECTION LOCATION
ELEVATION IN FEET (NAVD 88)
630
625
620
615
610
605
600
595
590
585
640
635
630
625
620
615
610
605
600
595
9.0
9.5
10.0
10.5
11.0
11.5
12.0
12.5
13.0
13.5
14.0
STREAM DISTANCE IN THOUSANDS OF FEET ABOVE CONFLUENCE WITH WEST FORK TRINITY RIVER
FLOOD PROFILES
FARMERS BRANCH
FEDERAL EMERGENCY MANAGEMENT AGENCY
TARRANT COUNTY, TX
AND INCORPORATED AREAS
191P

Appendix SW-D – Updated Hydrology with 2014 land use

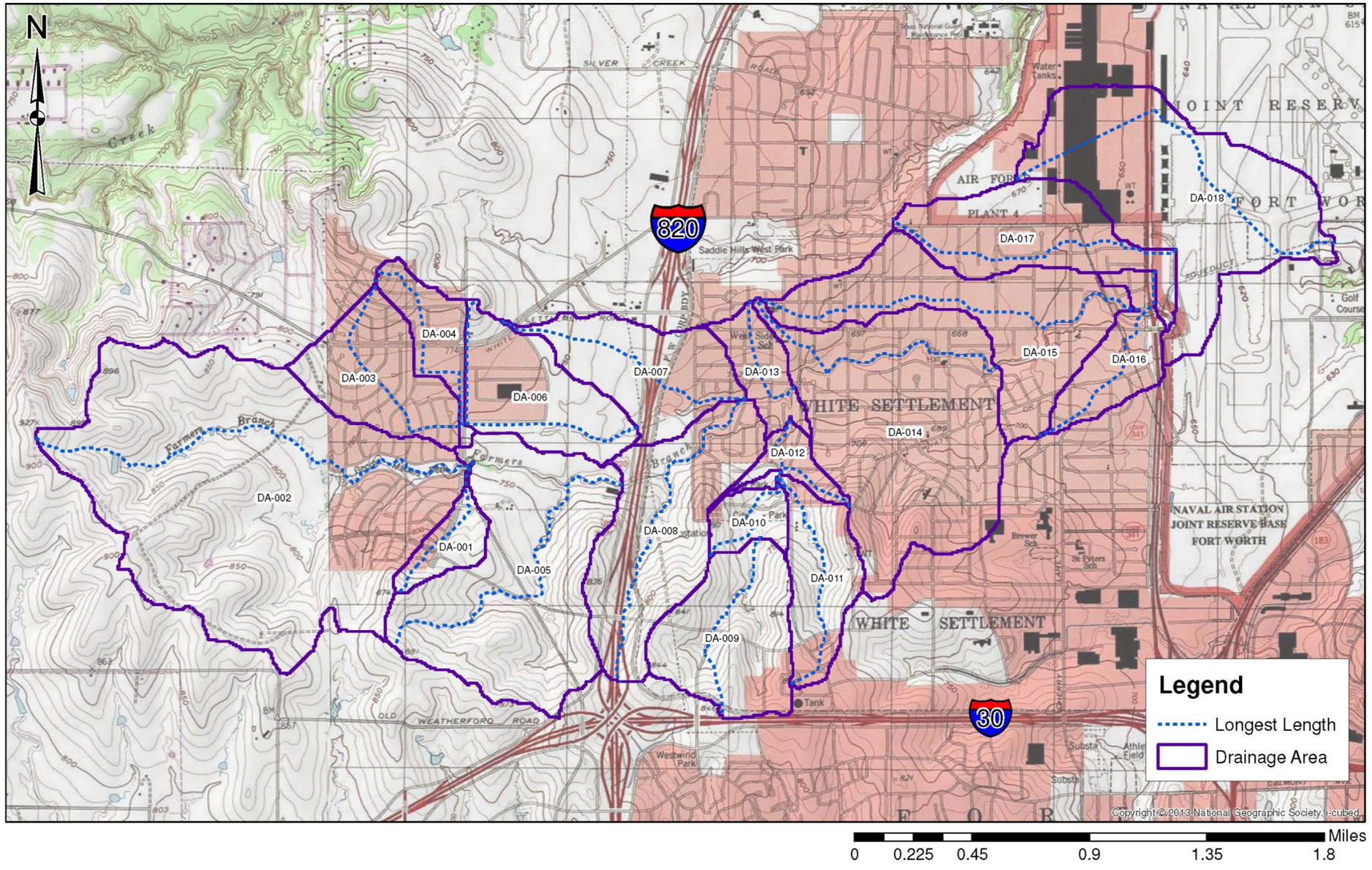
D.1 – Drainage Area Map

D.2 – 2014 Landuse Map

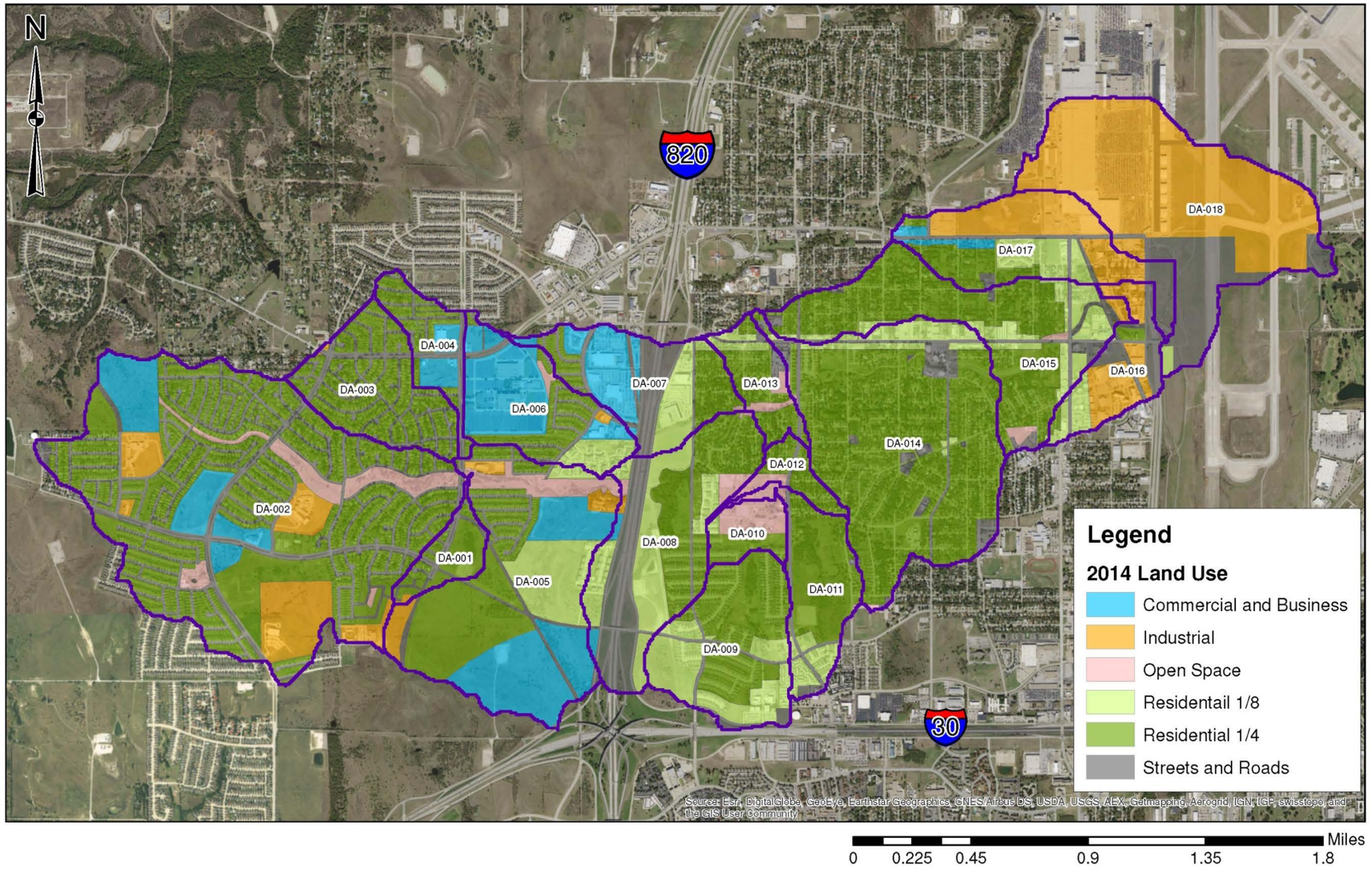
D.3 – NRCS Soils Map

D.4 – Table 6 - Hydrologic Comparison

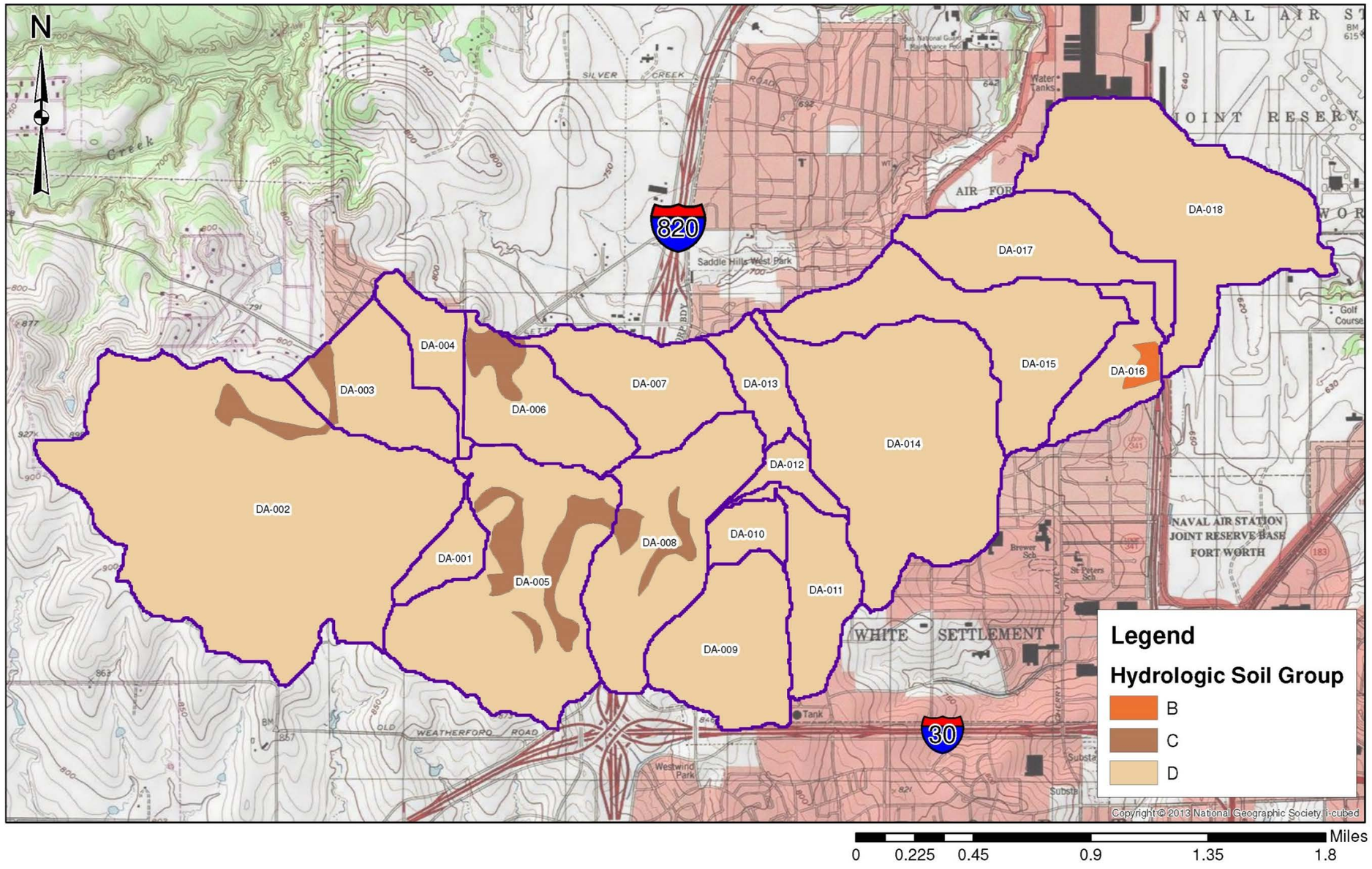
Appendix D.1: Drainage Area Map



Appendix D.2: 2014 Land Use Map

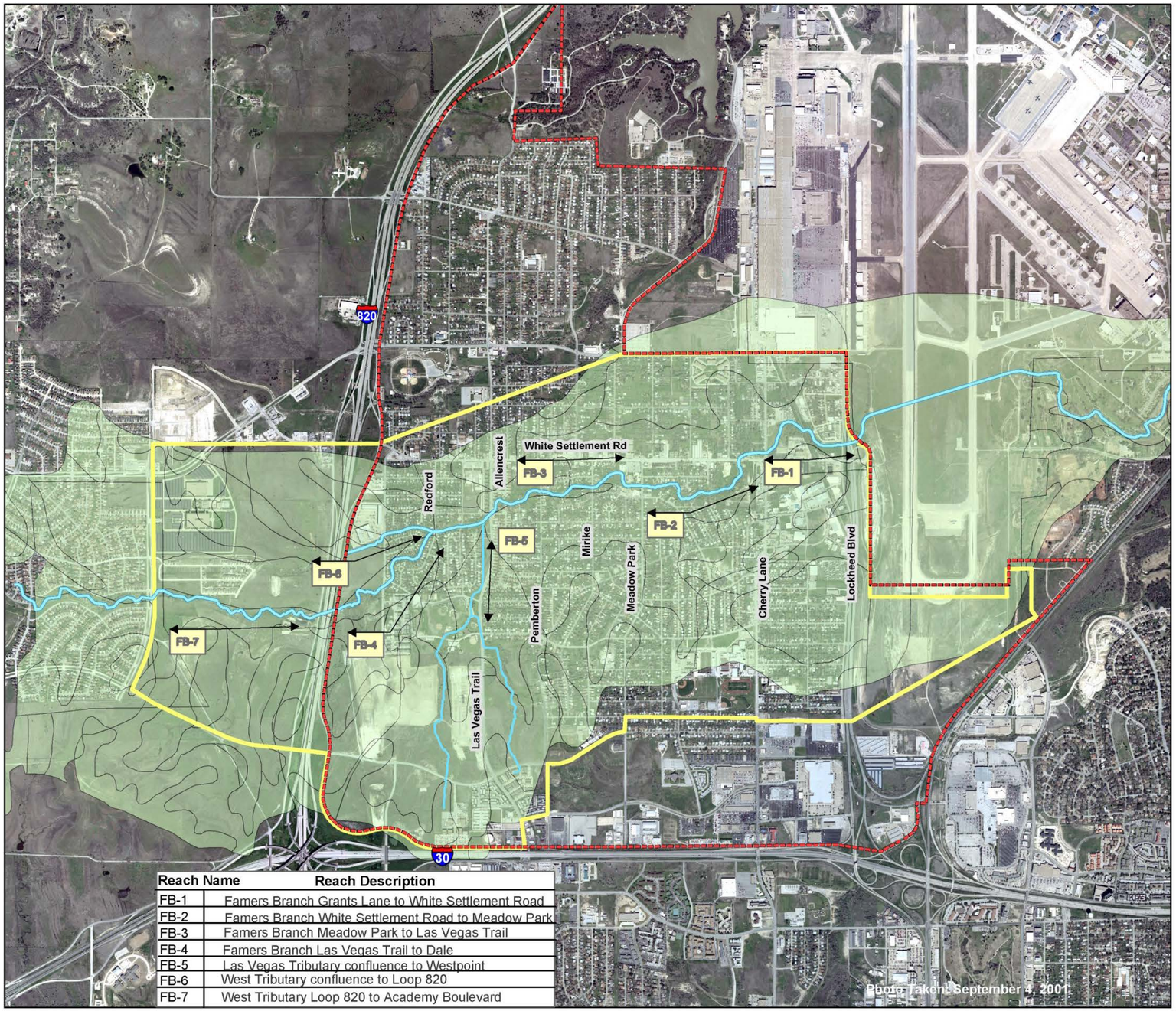


Appendix D.3: USDA NRCS Soils Map

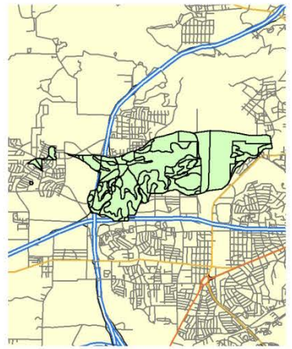


Appendix SW-E- Economic Damage Reaches

Farmers Branch: Study Area



Reach Name	Reach Description
FB-1	Famers Branch Grants Lane to White Settlement Road
FB-2	Famers Branch White Settlement Road to Meadow Park
FB-3	Famers Branch Meadow Park to Las Vegas Trail
FB-4	Famers Branch Las Vegas Trail to Dale
FB-5	Las Vegas Tributary confluence to Westpoint
FB-6	West Tributary confluence to Loop 820
FB-7	West Tributary Loop 820 to Academy Boulevard



Legend

- Farmers Branch
- Watershed
- City Limits
- Studyarea

0 350700 1,400 2,100 2,800 3,500

Feet

US Army Corps of Engineers
Fort Worth District

Appendix SW-F – Acronyms

AEP	Annual Exceedance Probability
BFE	Base Flood Elevation
BMPs	best management practices
cfs	cubic feet per second
DEM	Digital Elevation Model
FEMA	Federal Emergency Management Agency
FIRM	Flood Insurance Rate Map
FIS	Flood Insurance Study
IH 820	Interstate 820
iSWM™	*integrated* Stormwater Management
LID	Low Impact Development
LIDAR	Light Detection and Ranging
LOMR	Letter of Map Revision
LPP	Locally Preferred Plan
LVTrail	Las Vegas Trail
NCTCOG	North Central Texas Council of Governments
NED	National Economic Development Plan
NFIP	National Flood Insurance Program
Q	flow
SFHA	Special Flood Hazard Area
SH 183	State Highway 183
SH 199	State Highway 199
TxDOT	Texas Department of Transportation
USACE	United States Army Corps of Engineers
USGS	United States Geological Survey
WSEL	Water Surface Elevation

Attachment I – Technical References

These attachments are included within the enclosed CD.

K.1 - FinalJLUSReportMarch2008

K.2 – FEMA FIRM and FIS Report

K.3 – Section 205

K.4 – Watershed Roundtable

K.5 – SH199 Corridor Master Plan

K.6 – River Oak (SH 183) Drainage Summary

Attachment II – Digital Modeling

These attachments are included within the enclosed CD.

II.1 – HEC-HMS Model – USACE

II.2 – HEC-HMS Model – Revised Hydrology

II.3 – GIS Modeling

DEPARTMENT OF THE NAVY
COMMANDING OFFICER
NAVAL AIR STATION FORT WORTH
JOINT RESERVE BASE
1510 CHENNAULT AVENUE
FORT WORTH, TEXAS 76127-5000

5223
Ser N00/607
August 30, 2017

Ms. Amanda Wilson
616 Six Flags Drive
Arlington, Texas 76011

Dear Ms. Wilson:

Subj: JOINT LAND USE STUDY – STORM WATER AND FLOODING ISSUES

I understand an objective of the current, regional Joint Land Use Study (JLUS) sought to understand storm water and flooding impacts, if any, to the base and surrounding municipalities. In addition to previous communication from Naval Air Station Fort Worth Joint Reserve Base, Command and Public Works staff, this letter constitutes further confirmation there are currently no significant, or recurring, flooding concerns within the fence line.

However, to help uphold the positive, long-standing trend towards compatible development between the installation and communities, future low-impact development and integrated storm water management strategies are critical due to forecast growth expected in west Tarrant County.

For any related concerns or questions please contact Mike Branum, Community Planning and Liaison Officer, at 817-782-7609 or michael.branum@navy.mil.

Sincerely,

J. A. TURNER
By direction of the
Commanding Officer
NAS Fort Worth JRB

Technical Appendix L.

Comprehensive Plan Guidelines

Comprehensive Plan Guidelines

Comprehensive Plans are designed to serve as the jurisdiction's blueprint for future decisions concerning land use, infrastructure, public services, and resource conservation. The plan identifies the development policies of the jurisdiction in the form of goals, policies, standards, implementation measures, maps and diagrams.

The purpose of these guidelines is to assist cities and counties in addressing military compatibility issues when developing, updating or significantly amending their Comprehensive Plans. Local governments can add the following narrative, goals, and policies to their plans either as a separate element or as supplementary language to strengthen existing goals and policies.

Goal: Health, Safety, and Welfare

Protect public health, safety and welfare near military installations from hazards associated with aerial and land-based military operations.

> **Policy: Compatible Land Use**
>
> Designate compatible land use in areas adjacent to military installations and where military operations, testing, and training activities occur.

Goal: **Compatibility with the Military**

Promote future development that protects the public health, safety, and welfare by minimizing risk to life, property and the well-being of residents from military training and testing operations and maintaining compatibility with current and foreseeable missions at [military installation].

Policy: Role of [military installation]

Continue to support the unique and vital mission capabilities of [military installation] and the significant contribution of the installation to the economic base of the community and region.

Policy: Military-Community Partnerships

Partner with [military installation] to anticipate and meet community growth and service demands related to military mission change and to ensure that residents of participate in economic opportunities and outreach activities associated with the installation.

Goal: Communication/Coordination

Foster meaningful, ongoing communication among, residents, [military installation] and regional partners to increase awareness of Department of Defense and other federal and state missions and activities and to coordinate on ongoing compatibility planning and management activities.

Policy: Support for Compatibility Implementation

Continue [City/County] participation in the Joint Land Use Study (JLUS) by appointing primary points of contact to facilitate the communication and coordination strategies recommended in the JLUS Report.

Policy: Information Exchange with [military installation]

Work with [military installation] to establish ongoing communication mechanisms for issues of mutual concern, including mission or operational changes that could affect the

surrounding community or specific development and infrastructure projects that could affect compatibility with training operations.

Policy: Regional Coordination

Schedule regular meetings with other jurisdictions and the military to ensure regional military compatibility issues are addressed throughout the region.

Policy: Increase Public Awareness

Partner with [military installation] to make information on the potential impacts of training operations available to residents.

Policy: Development Review

Review community development and infrastructure proposals for interaction that could produce compatibility challenges with training operations, including: noise sensitive uses in areas of known exposure to aviation and range noise; physical infrastructure that could interfere with low-level flight operations; and sources of electrical emissions that could interfere with military communications or navigation systems.

Policy: Military Involvement and Planning Process

Provide notice to [military installation] for review and comment on [County/City] discretionary land use actions to include, but not be limited to, Comprehensive/Area Plan amendments or updates, zoning changes, land development code changes, and subdivision plats.

Goal: Land Use Compatibility

Enhance land use compatibility between [military installation] and property in the surrounding area and to protect public health and safety.

Policy: Military Influence Area (MIA) Overlay

Define and maintain a Military Influence Area (MIA) as an overlay to the zoning map. The MIA will consist of areas based on noise and safety guidance from the [Air Installation Compatible Use Zone] study, as well as other compatibility factors evaluated in the JLUS program. Within the MIA, the [County/City] will implement a variety of land use, communication and other mitigation techniques to reduce possible land use conflicts and protect the health and safety of people and property in affected areas. The appropriate strategies will vary based upon the particular operational impacts associated with sub-areas of the MIA.

Policy: Military Training Routes and Special Use Airspace

Where appropriate, designate lands adjacent to military installations and under low level flight paths as open space or low density commercial/light industrial zoning with building height restrictions which facilitate military aviation.

Policy: Support for Buffering Activities

Open space, agriculture, and low-density uses adjacent to military activities provide a critical buffer that protects surrounding areas from the nuisance and safety risks of nearby military operations; therefore, as part of overall compatibility strategies, the [County/City] will, whenever feasible, use open space and conservation planning to assist in establishing buffers in proximity to [military installation and training areas].

Policy: Noise Mitigation

Minimize noise impacts by designating compatible land uses and establish development standards in areas exposed to high noise levels.

Policy: Aviation Hazards

Consult with military planners on the siting of energy infrastructure or other infrastructure to minimize flight hazards in military airspace, particularly in low-level flight corridors, and to reduce the risk of interference with military communication systems

Goal: Transportation

Ensure adequate circulation routes are maintained between the installation and related operational areas (e.g., training areas and supply depots), and to ensure these activities do not interfere with safety and civilian transportation needs.

Policy: Circulation

Ensure the protection of community and military transportation corridors to maintain viability of the installation and its operations and provide for safe circulation and access.

Policy: Transportation Planning

Consider the needs of military installations when planning transportation and infrastructure projects by consulting regularly with the military to ensure military routes are depicted accurately on the plan diagrams and maps.

AECOM
1950 N. Stemmons Freeway
Suite 6000
Dallas, TX 75202, USA
aecom.com

Regional Implementation Items

Topic	Implementation Item	Lead	NCTCOG	TTC	NAS Fort Worth JRB	Fort Wolters	Fort Maxey	RTAHP	Eagle Mountain	Stone Army Res.	MOA's
Aviation and Airspace Safety	**Educational Outreach and Technical Assistance to Local Law Enforcement for UAS activity**	NCTCOG, Military Installations									
Aviation and Airspace Safety	**Collaborate with military installations and regional airports to determine appropriate "no-fly" zones for UAS**	NCTCOG									
Aviation and Airspace Safety	**Coordinate with the FAA to align local actions with federal policy and identify appropriate roles for local officials**	NCTCOG									
Aviation and Airspace Safety	**Publish a brochure that identifies UAS risks to military operations and highlights FAA guidelines on small UAS operations**	NCTCOG									
Aviation and Airspace Safety	**Post UAS-related technical resources and policy/regulatory updates on the NCTCOG Aviation Planning and Education web site**	NCTCOG									
Aviation and Airspace Safety	**Conduct specific outreach with city and county law enforcement to assist them in identifying UAS threats and establishing penalties (e.g. fines)**	NCTCOG									
Aviation and Airspace Safety	**Collaborate with FAA and DoD to define Temporary Flight Restrictions over military facilities**	NCTCOG									
	Track Aviation Trends and Mission Changes	NAS Fort Worth, JRB, Dallas-Fort Worth International Airport, Dallas Love Field, Dallas Executive Airport, NCTCOG									
Aviation and Airspace Safety	**Increase Awareness and Outreach about Safety in Airspace**	NCTCOG/NAS Fort Worth JRB									

Regional Implementation Items

	Topic	Implementation Item	Lead	NCTCOG	TTC	NAS Fort Worth JRB	Fort Wolters	Fort Maxey	RTAHP	Eagle Mountain	Stone Army Res.	MOA's
High Priority	Communication and Coordination	**Communicate with RCC and Stakeholders on Operations and Opportunities**	NCTCOG									
	Communication and Coordination	**Create Region-wide Advocacy Group for Military Installations**	NCTCOG									
	Communication and Coordination	**Identify participating representatives of the region-wide body**	NCTCOG									
	Communication and Coordination	**Define basic organizational roles and responsibilities, and areas of focus through bylaws and operating procedures**	NCTCOG									
	Communication and Coordination	**Identify an existing organizational structure to house regional activities (e.g. RCC or TCC)**	NCTCOG									
	Communication and Coordination	**Convene a yearly forum of Joining Forces military and community stakeholders to communicate updates in missions and operational activities, identify common interests and available resources, track progress on compatibility actions, and jointly pursue legislative and funding opportunities**	NCTCOG									
	Communication and Coordination	**Participate in statewide coordination among communities undergoing Joint Land Use Studies or implementing recommendations from a JLUS report**	NCTCOG									
	Statewide Policy/ Legislative Actions	**Pursue Compatible State Legislation/Policy**	Military Installations, TTC, NCTCOG									
	Statewide Policy/ Legislative Actions	**Continue to identify targeted zoning around military installations as a legislative priority for the TCC, RCC, and Joining Forces region-wide body**	Military Installations, TTC, NCTCOG									
	Statewide Policy/ Legislative Actions	**Highlight best practice examples from counties that currently enact land use controls near installations**	Military Installations, TTC, NCTCOG									

Regional Implementation Items

	Topic	Implementation Item	Lead	NCTCOG	TTC	NAS Fort Worth JRB	Fort Wolters	Fort Maxey	RTAHP	Eagle Mountain	Stone Army Res.	MOA's
	Statewide Policy/ Legislative Actions	**Meet with administrative staff of area legislators and discuss the sponsorship and drafting of proposed legislation to mitigate the impact of incompatible development and practices on military operations**	Military Installations, TTC, NCTCOG									
	Statewide Policy/ Legislative Actions	**Prepare to provide expert testimony during Legislative Session in support of bill passage**	Military Installations, TTC, NCTCOG									
	Energy Infrastructure	**Energy and Infrastructure Siting Guidelines and Notification Process**	NCTCOG/City and County Governments									
	Energy Infrastructure	**Coordinate with TCC and TMPC on Energy Infrastructure Guidance**	City and County Governments									
Medium Priority	Air Quality	**NAAQS Air Quality Compliance**	NCTCOG/NAS Fort Worth JRB									
	Energy Infrastructure	**Maintain Regional Database to Track Flight Hazards**	NCTCOG									
	Land Use	**Develop Toolbox for Compatible Land Use**	NCTCOG									
	Noise Management/Avoidance	**Create Noise Management Reporting System**	NAS Fort Worth, JRB									
	Statewide Policy/ Legislative Actions	**Support Strategic Infrastructure and Investments for Compatibility**	Military Installations, TCC, NCTCOG									
	Energy Infrastructure	**Strengthen Existing DoD Siting Clearinghouse Process**	Military Installations									
	Statewide Policy/ Legislative Actions	**Pursue Legislation for Airbase Consultation with Communities**	Military Installations, TCC, NCTCOG									
	Aviation and Airspace Safety	**Develop model UAS guidance and an ordinance for use by local governments to govern the operation of small UAS**	NCTCOG/All Military Installations									
	Statewide Policy/ Legislative Actions	**State Legislation/Guidance in Compatible Energy Projects and Siting**	Military Installations, TCC, NCTCOG									

	Not Started
	Completed
	In Progress

	Topic	Implementation Item	Lead	NCTCOG	TCC	NAS Fort Worth JRB	Benbrook
	Aviation and Airspace Safety	**Identify Areas Vulnerable to UAS Activity and Threats**	NAS Fort Worth JRB				
	Communication and Coordination	**Provide Feedback in Development Review Tool**	NCTCOG				
	Communication and Coordination	**Support H.B. 890 and Compatibility Studies**	Municipalities, Tarrant County				
	Communication and Coordination	**Welcome Packet for New Residents on Base Operations**	Muncipalities, NAS Fort Worth JRB				
	Energy Infrastructure	**Coordinate Siting of Energy Infrastructure**	Municipalities, Tarrant County				
	Transportation	**Improve Meandering RD. and the SH 183 and 199 Corridors**	Muncipalities, Tarrant County, NCTCOG, TxDOT				
	Frequency and Spectrum Management	**Identify "Exclusion Zones" for military Navigational Aid (NAVAID) protection to assist local governments in siting decisions:**	NAS Fort Worth JRB				
	Land Use	**Adopt Land Use/Development Regulatory Overlay in Noise Contour and APZ**	Muncipalities				
	Local Government Plans	**Local Governments Promote Safe Development along the Assault Landing Strip**	City of Fort Worth				
	Statewide Policy/ Legislative Actions	**Monitor proposed legislation that encourages military-community compatibility**	Military Installations, NCTCOG, TCC, Joining Forces region-wide body	Legislative Update given at RCC meeting January 22, 2018. Upcoming update April 16, 2018			
	Statewide Policy/ Legislative Actions	**Continue to identify statewide compatibility initiatives as legislative priorities for the TCC, RCC, and region-wide body**	Military Installations, NCTCOG, TCC, Joining Forces region-wide body	RCC Legislative Subcommittee met 3/5/18 to dicuss policy positions. April 16 RCC meeting topics will be presented. July 16 RCC meeting legislative position will be approved.	RCC Legislative Subcommittee met 3/5/18 to dicuss policy positions. April 16 RCC meeting topics will be presented. July 16 RCC meeting legislative position will be approved.	RCC Legislative Subcommittee met 3/5/18 to dicuss policy positions. April 16 RCC meeting topics will be presented. July 16 RCC meeting legislative position will be approved.	RCC Legislative Subcommittee met 3/5/18 to dicuss policy positions. April 16 RCC meeting topics will be presented. July 16 RCC meeting legislative position will be approved.
	Statewide Policy/ Legislative Actions	**Meet with administrative staff of area legislators and discuss the sponsorship and drafting of proposed legislation to mitigate the impact of incompatible development and practices on military operations**	Military Installations, NCTCOG, TCC, Joining Forces region-wide body				

	Topic	Implementation Item	Lead	NCTCOG	TCC	NAS Fort Worth JRB	Benbrook
High Priority	Statewide Policy/ Legislative Actions	**Meet with representatives of state-level agencies, such as ERCOT to facilitate statewide coordination and data sharing**	Military Installations, NCTCOG, TCC, Joining Forces region-wide body				
	Statewide Policy/ Legislative Actions	**Prepare to provide expert testimony during Legislative Session in support of bill passage**	Military Installations, NCTCOG, TCC, Joining Forces region-wide body				
	Noise Management/Avoidance	**Adopt Sound Attenuation Building Standards for Indoor Noise Reduction**	Municipalities, Tarrant County				
	Outdoor Lighting/Signs	**Dark-Sky Provisions Explore**	Municipalities, Tarrant County				
	Stormwater/Drainage	**Integrated Stormwater Management (ISWM) and Low Impact Development (LID) to Reduce Flooding**	NCTCOG				
	Stormwater/Drainage	**Increase Function of Existing Stormwater Infrastructure**	TxDOT, City of White Settlement, City of Fort Worth				
	Stormwater/Drainage	**Enhance Erosion Control on Stormwater Infrastructure**	TxDOT, City of White Settlement, City of Fort Worth				
	Stormwater/Drainage	**Conduct a hydrology and hydraulic study for the Farmers Branch Watershed, updated from 2005**	TxDOT, City of White Settlement, City of Fort Worth				
	Environmental/Cultural Resources	**Explore Readiness and Environmental Protection Integration (REPI) Projects around Base**	NAS Fort Worth JRB				
	Environmental/Cultural Resources	**Meet with state and regional stakeholders to introduce conservation objectives, partnerships, and benefits to the community and base**	NAS Fort Worth JRB				
	Environmental/Cultural Resources	**Identify potential areas for land preservation and conservation programs through partnerships with land conservation organizations and land trust agencies**	NAS Fort Worth JRB				

	Topic	Implementation Item	Lead	NCTCOG	TCC	NAS Fort Worth JRB	Benbrook
	Environmental/Cultural Resources	**Explore potential statewide partnerships with Texas A&M University, the Texas A&M AgriLife Extension Service, and the TCC to prepare a strategic plan for identifying place-based conservation pilots, and preparing nomination documentation to establish Texas REPI and Sentinel Landscapes projects**	NAS Fort Worth JRB				
	Environmental/Cultural Resources	**Align possible REPI areas around the main base of NAS Fort Worth JRB with regional and local conservation priorities or opportunities for the voluntary acquisition of land in airfield AICUZ areas**	NAS Fort Worth JRB				
Medium Priori	Communication and Coordination	**Update Existing Outreach Materials**	NAS Fort Worth JRB, NCTCOG	Brochure being developed to explain JLUS study and recommendations.			
	Communication and Coordination	**Tailor Communication and Outreach to Vulnerable Population Groups and Demographics**	NCTCOG				
	Communication and Coordination	**Maintain Inventory of Civilian-Military Compatibility Actions**	NCTCOG				
	Communication and Coordination	**Coordinate with Lake Worth Reservoir on Environmental and Security Impacts**	NAS Fort Worth JRB, City of Lake Worth, City of Fort Worth				
	Energy Infrastructure	**Establish Permitting Process for Energy Projects that Considers Vertical Intrusion/Radar**	Muncipalities				
	Land Use	**Reduce Bird Attraction**	Muncipalities				
	Land Use	**Use Capital Improvement Planning to Shape Growth Patterns**	Muncipalities				
	Local Government Plans	**Implement the recommendations in the Planning for Livable Military Communities (PLMC) document**	Muncipalities, Tarrant County				
	Local Government Plans	**Incorporate JLUS Recommendations in Comprehensive Plans**	Muncipalities, Tarrant County				

	Topic	Implementation Item	Lead	NCTCOG	TCC	NAS Fort Worth JRB	Benbrook
t y	Military Plans/Operations	**Conduct Analysis on Changes in Noise Impact**	NAS Fort Worth JRB				
	Noise Management/Avoidance	**Manage Off-installation Aviation Noise through Time Adjustments**	NAS Fort Worth JRB				
	Noise Management/Avoidance	**Outreach for Communities Underlying MOA's and MTR's**	NAS Fort Worth JRB				
	Noise Management/Avoidance	**Explore Development Incentive Program for Homeowners and Sound Attenuation**	NCTCOG				
	Noise Management/Avoidance	**Sound Mitigation Certification Program for Homebuilders**	NCTCOG				
	Outdoor Lighting/Signs	**Coordinate with Communities on Billboard Placement and Sign Lighting**	Muncipalities, Tarrant County				
	Physical Security	**Enhance Installation Perimeter Security**	Muncipalities, Tarrant County				
	Stormwater/Drainage	**Maintain pre-development site runoff levels**	FEMA				
	Transportation	**Alleviate Traffic Congestion in Surrounding Areas**	NAS Fort Worth JRB				
L o w P r i o r i t y	Outdoor Lighting/Signs	**Retrofit Older, Unshielded Lighting Applications**	Muncipalities, Tarrant County				
	Noise Management/Avoidance	**Connect Homeowners to Energy Efficient Resources to Mitigate Sound**	Muncipalities, Tarrant County				
	Land Use	**Explore Feasibility of the Voluntary Acquisition of Land in Airfield Clear Zones and Accident Potential Zones**	Muncipalities				

Fort-Worth	Lake Worth	River Oaks	Sansom Park	Tarrant County	Westworth Village	White Settlement
RCC Legislative Subcommittee met 3/5/18 to dicuss policy positions. April 16 RCC meeting topics will be presented. July 16 RCC meeting legislative position will be approved.	RCC Legislative Subcommittee met 3/5/18 to dicuss policy positions. April 16 RCC meeting topics will be presented. July 16 RCC meeting legislative position will be approved.	RCC Legislative Subcommittee met 3/5/18 to dicuss policy positions. April 16 RCC meeting topics will be presented. July 16 RCC meeting legislative position will be approved.	RCC Legislative Subcommittee met 3/5/18 to dicuss policy positions. April 16 RCC meeting topics will be presented. July 16 RCC meeting legislative position will be approved.	RCC Legislative Subcommittee met 3/5/18 to dicuss policy positions. April 16 RCC meeting topics will be presented. July 16 RCC meeting legislative position will be approved.	RCC Legislative Subcommittee met 3/5/18 to dicuss policy positions. April 16 RCC meeting topics will be presented. July 16 RCC meeting legislative position will be approved.	RCC Legislative Subcommittee met 3/5/18 to dicuss policy positions. April 16 RCC meeting topics will be presented. July 16 RCC meeting legislative position will be approved.

Fort-Worth	Lake Worth	River Oaks	Sansom Park	Tarrant County	Westworth Village	White Settlement

Fort-Worth	Lake Worth	River Oaks	Sansom Park	Tarrant County	Westworth Village	White Settlement

Fort-Worth	Lake Worth	River Oaks	Sansom Park	Tarrant County	Westworth Village	White Settlement

Not Started
Completed
In Progress

	Implementation Item	Category	Complete
Development Review Tool	**Providing training, particularly to new RCC members and planning and technical staff, should form an essential component of the strategic plan to improve the Development Review Web Tool**	Broad	
	Aligning the tool with municipalities' existing workflows could make the tool easier to use by allowing users to incorporate it into their daily activities	Broad	
	Updating the web design and mapping component of the tool would renew a sense of initiative	Broad	
	Update User Accounts	High Priority	
	Update legend descriptions for noise contours to reflect the range	High Priority	
	Add a column to comments table called "Recommendation" with four choices: compatible; incompatible; compatible with sound attenuation; and compatible with other conditions	High Priority	
	Add a very visible link to OPNAV in the References box	High Priority	
	Update color choice and transparency to address blending of colors/reduced readability	High Priority	
	Provide clear instructions for uploading non-parcel-specific information for review	High Priority	
	Move or duplicate the "return to project listing" link from the bottom to the top of the page	Medium Priority	
	Include a qualitative/descriptive heading under Project Details	Medium Priority	

	Implementation Item	Category	Complete
	Have dynamic layers in map that can be turned on or off	Low Priority	
	Change label style for streets so they recede into the background	Low Priority	
	Set the initial scale so it is zoomed out more for context	Low Priority	

	Topic	Implementation Item	Lead	Texas Military Department	NCTCOG	Camp Maxey	Paris	Lamar County
High Prior	Aviation and Airspace Safety	**Identify Areas Vulnerable to UAS Activity and Threats**	Camp Maxey					
	Aviation and Airspace Safety	**Jointly develop informational materials with local airports, and conduct outreach to the general aviation community to communicate safety risks to low-flying aircraft over Camp Maxey**	Camp Maxey, City of Paris, Lamar County					
	Aviation and Airspace Safety	**Develop a consistent consultation process with Camp Maxey on the potential siting of energy infrastructure and provide any updated mapping of the location of tall structures**	Camp Maxey, City of Paris, Lamar County					
	Aviation and Airspace Safety	**Establish siting and design standards for uses, such as detention ponds, sanitary landfills, and crops in areas subject to low-level flights**	Camp Maxey, City of Paris, Lamar County					
	Aviation and Airspace Safety	**Coordinate on BASH measures with resource management entities, particularly at Pat Mayse Lake**	Camp Maxey, City of Paris, Lamar County					
	Aviation and Airspace Safety	**Reach Out to General Aviation Community about Low Flying Plane Risks**	Camp Maxey					
	Communication & Coordination	**Create Ongoing Channels of Communications with Local Communities**	Camp Maxey, City of Paris, Lamar County					
	Communication & Coordination	**Collaborate with Ark-Tex COG on the organizational structure of the coordination body and potential technical support**	Camp Maxey, City of Paris, Lamar County					
	Communication & Coordination	**Conduct outreach to county officials to build support for participation in compatibility efforts**	Camp Maxey, City of Paris, Lamar County					
	Communication & Coordination	**Identify participating representatives of the coordination body to include a representative from Pat Mayse Lake reservoir and Wildlife Management Area**	Camp Maxey, City of Paris, Lamar County					
	Communication & Coordination	**Define basic organizational roles and responsibilities, and areas of focus through bylaws and operating procedures**	Camp Maxey, City of Paris, Lamar County					
	Communication & Coordination	**Convene at least a yearly session of the coordinating body and develop an email database for more frequent, informal communication**	Camp Maxey, City of Paris, Lamar County					
	Communication & Coordination	**Develop Outreach Materials to Highlight Economic Activity and Safety**	Camp Maxey					
	Communication & Coordination	**Coordinate with Pat Mayse Lake Reservoir and Wildlife Management Area on Operations**	Camp Maxey, Texas Military Department					

	Topic	Implementation Item	Lead	Texas Military Department	NCTCOG	Camp Maxey	Paris	Lamar County
i t y	Communication & Coordination	**Support TX H.B. 890 through Availability of Compatibility Related Studies**	City of Paris, Lamar County					
	Energy Infrastructure	**Coordinate Siting of Energy Infrastructure**	City of Paris, Lamar County					
	Land Use	**Coordinate with State Legislature and County of Lamar for Legal Land Use Controls**	City of Paris, Lamar County					
	Land Use	**Voluntary Memorandum of Joint Consultation of Changing Military Operations**	City of Paris, Lamar County, Camp Maxey					
	Land Use	**Reduce Bird Attraction**	City of Paris, Lamar County					
	Land Use	**Use State of Texas Authority to Establish Joint Airport Zone (JAZ)**	City of Paris, Lamar County					
	Local Government Plans	**Coordinate with Pat Mayse Lake and WMA on Security Issues for Recreational Users**	Camp Maxey, Texas Military Department					
	Local Government Plans	**Explore moving the Camp Maxey boundary north to the lake, thus eliminating hunting at the northern installation boundary and helping to improve antitrespass enforcement**	Camp Maxey, Texas Military Department					
	Local Government Plans	**Explore banning hunting (and restricting other access) to the area between Camp Maxey and the lake**	Camp Maxey, Texas Military Department					
	Local Government Plans	**Install signage to indicate safety risks associated with unauthorized entry onto training lands**	Camp Maxey, Texas Military Department					
	Local Government Plans	**Jointly develop outreach materials in printed and digital formats to raise safety awareness among recreational users and hunters and deter trespass**	Camp Maxey, Texas Military Department					
	Physical Security	**Coordinate Maintenance of Easement Road on Camp Maxey and Regulate Use to Avoid Trespass**	Camp Maxey, City of Paris					
	Physical Security	**Work with the USACE to explore strategies to reduce the risk of trespass**	Camp Maxey, Texas Military Department					
M	Communication & Coordination	**Conduct Annual Briefings for Partner Communities**	Camp Maxey					
	Communication & Coordination	**Conduct on-Installation Field Trips for Partners and Public**	Camp Maxey					

	Topic	Implementation Item	Lead	Texas Military Department	NCTCOG	Camp Maxey	Paris	Lamar County
Medium Priority	Communication & Coordination	**Invite Military Representatives to Sit as Non-Voting Members of Commissions**	City of Paris, Lamar County					
	Economic Development	**Increase Economic Development Efforts**	City of Paris					
	Energy Infrastructure	**Establish Permitting Process for Energy Infrastructure**	Lamar County					
	Fire Management	**Fire Management and Prevention**	Camp Maxey					
	Land Use	**Use Capital Improvement Planning to Shape Growth Patterns**	City of Paris					
	Local Government Plans	**Invite Military and JF Partners to Participate in Planning Advisory Boards**	City of Paris, Lamar County					
	Military Plans/Operations	**Brief Visiting Military Units on Noise Mitigation Procedures**	Camp Maxey					
	Military Plans/Operations	**Enhance Installation Perimeter Security and Entry Points**	Camp Maxey, Texas Military Department					
	Physical Security	**Explore Alternative Opportunities to Promote Perimeter Security**	Camp Maxey, Texas Military Department					
	Transportation	**Add directional signs and "Military Entrance Ahead" signs to increase awareness**	TxDOT, Lamar County					
	Transportation	**Develop Access Plan for Camp Maxey/Intersection Improvements**	TxDOT, Lamar County					
Low Priority	Communication & Coordination	**Welcome Packet for New Residents on Base Operations**	Camp Maxey, Texas Military Department					
	Environmental/Cultural Resources	**Collaborate with Conservation Partners for REPI, ACUB and Sentinel Landscape Partnership**	Camp Maxey, Texas Military Department					
	Local Government Plans	**Incorporate JLUS Recommendations in Comprehensive Plans**	City of Paris, Lamar County					
	Military Plans/Operations	**Conduct Analysis on Changes in Noise/Safety Impact**	Camp Maxey, Texas Military Department					
	Transportation	**Identify Strategic Upgrades to Insure Safety of Surrounding Road Network**	Ark-Tex Council of Governments, TxDOT					

	Not Started
	Completed
	In Progress

	Topic	Implementation Item	Lead	RTAHP	City of Grand Prairie	City of Dallas	Texas Military Department	Dallas County	NCTCOG
High Priority	Aviation and Airspace Safety	**Identify Areas Vulnerable to UAS Activity and Threats**	RTAHP						
	Communication & Coordination	**Continue Briefing Regional Partners**	NCTCOG						
	Communication & Coordination	**Enhance Participation in Established Channels of Communication and Meetings**	RTAHP, City of Dallas, City of Grand Prairie						
	Communication & Coordination	**Identify interested parties and develop a contact list for various coordination efforts**	RTAHP, City of Dallas, City of Grand Prairie, NCTCOG						
	Communication & Coordination	**Develop information sharing protocols, including items of interest, notification procedures, and methods of communication**	RTAHP, City of Dallas, City of Grand Prairie, NCTCOG						
	Communication & Coordination	**NCTCOG should identify resources to assist RTAHP in monitoring development and planning activities in surrounding communities**	RTAHP, City of Dallas, City of Grand Prairie, NCTCOG						
	Communication & Coordination	**Establish clear points of contact in departments, such as the City of Dallas Real Estate Division of the Sustainable Development and Construction Department, the City of Dallas Aviation Department, the City of Grand Prairie City Council Development Committee, and Real Property at the Texas Military Department**	RTAHP, City of Dallas, City of Grand Prairie						
	Communication & Coordination	**Consider inviting Joining Forces partners, as relevant, to participate as a stakeholder in major plan updates and amendments, including Comprehensive Plans, and area, neighborhood, or corridor plans, which could affect RTAHP operations**	RTAHP, City of Dallas, City of Grand Prairie						
	Communication & Coordination	**Post Compatibility-Related Studies on Website to Comply with H.B. 890**	City of Dallas, City of Grand Prairie, Dallas County						
	Communication & Coordination	**Develop Map of Noise Contour and Other Outreach Materials**	RTAHP						
	Communication & Coordination	**Continue Communication through Contact Established in Lease Agreement**	RTAHP, City of Dallas, City of Grand Prairie, Dallas County						
	Energy Infrastructure	**Coordinate Siting of Energy Infrastructure**	City of Grand Prairie, Dallas County						
	Local Government Plans	**Invite Joining Forces Partners to Participate as Stakeholder in Plan Updates**	City of Dallas, City of Grand Prairie, Dallas County						
	Local Government Plans	**Monitor Compatibility of Comprehensive Plans in Surrounding Cities**	City of Dallas, City of Grand Prairie, Dallas County						
	Noise Management/Avoidance	**Use Noise Attenuation Requirements around Hensley Field**	City of Dallas						
	Noise Management/Avoidance	**Adopt Sound Attenuation Building Standards for Indoor Noise Reduction**	City of Grand Prairie						

	Topic	Implementation Item	Lead	RTAHP	City of Grand Prairie	City of Dallas	Texas Military Department	Dallas County	NCTCOG
	Noise Management/Avoidance	**Initiate Outreach to Areas in Proximity to Hensley Field; Dallas Executive Airport, Midway Regional Airport**	RTAHP, Texas Military Department						
Medium Priority	Communication & Coordination	**Develop Voluntary Memorandum of Joint Consultation of Changing Military Operations**	City of Grand Prairie, Dallas County						
	Communication & Coordination	**Annual Briefing on Operations and Changes**	RTAHP						
	Communication & Coordination	**Conduct on-Installation Field Trips for Partners and Public**	RTAHP						
	Communication & Coordination	**Welcome Packet for New Residents on Base Operations**	RTAHP, Texas Military Department						
	Communication & Coordination	**Coordinate with Mountain Creek Lake to Ensure Security and Lessen Environmental Impacts**	RTAHP, Texas Military Department, U.S. Army Corps of Engineers, Texas Parks and Wildlife Department, Excelon Energy						
	Energy Infrastructure	**Monitor and Comment on Permitting Process for Energy Infrastructure/Projects**	RTAHP, NCTCOG						
	Land Use	**Adopt Land Use/Development Regulatory Overlay in Noise Contour and APZ**	City of Grand Prairie						
	Land Use	**Coordinate on Bird/Animal Aircraft Strike Hazard (BASH) measures with resource management entities**	City of Dallas, City of Grand Prairie						
	Land Use	**Consider Capital Improvement Planning and Infrastructure System Requirements**	City of Dallas, City of Grand Prairie, Dallas County						
	Military Plans/Operations	**Brief Visiting Military Units on Noise Mitigation Procedures**	RTAHP						
	Noise Management/Avoidance	**Manage Off-installation Aviation Noise through Time Adjustments**	RTAHP, Texas Military Department						
	Outdoor Lighting/Signs	**Explore Dark-Sky Provisions**	City of Dallas, City of Grand Prairie, Dallas County						
	Outdoor Lighting/Signs	**Coordinate with Communities on Billboard Placement and Sign Lighting**	City of Dallas, City of Grand Prairie, Dallas County						
	Physical Security	**Enhance Installation Perimeter Security**	RTAHP, Texas Military Department						
	Physical Security	**Coordinate with Mountain Creek on Recreational Users and Trespassing**	RTAHP, Texas Military Department, U.S. Army Corps of Engineers, Texas Parks and Wildlife Department, Excelon Energy Company						
	Transportation	**Make Strategic Upgrades to Surrounding Road Network**	NCTCOG, TxDOT, RTAHP, Texas Military Department						

	Topic	Implementation Item	Lead	RTAHP	City of Grand Prairie	City of Dallas	Texas Military Department	Dallas County	NCTCOG
	Transportation	**Move Entrance Gates to Northeast Side of RTAHP to Reduce Conflicts with Residential Neighborhood**	RTAHP, Texas Military Department						
L o w	Military Plans/Operations	**Conduct Analysis on Changes in Noise Impact**	RTAHP, Texas Military Department						
	oise Management/Avoidan	**Connect Homeowners to Energy Efficient Resources to Mitigate Sound**	City of Dallas, City of Grand Prairie, Dallas County						
	Outdoor Lighting/Signs	**Retrofit Older, Unshielded Lighting Applications**	City of Dallas, City of Grand Prairie, Dallas County						

	Not Started
	Completed
	In Progress

	Topic	Implementation Item	Lead	NCTCOG	NAS Fort Worth JRB	Texas Military Department	Parker County	Fort Wolters	Palo Pinto County	City of Mineral Wells
High Priority	Airspace and Aviation Safety	Identify Areas Vulnerable to UAS Activity and Threats	Fort Wolters, NAS Fort Worth, JRB							
	Communication and Coordination	Continue Briefing Regional Partners	NCTCOG							
	Communication and Coordination	Collaborate with NCTCOG, as necessary, on the organizational structure of the coordination body and potential technical support	Fort Wolters, City of Mineral Wells							
	Communication and Coordination	Conduct outreach to county officials to build support for participation in compatibility efforts	Fort Wolters, City of Mineral Wells							
	Communication and Coordination	Identify participating representatives of the coordination body to include a representative from Lake Mineral Wells State Park	Fort Wolters, City of Mineral Wells							
	Communication and Coordination	Define basic organizational roles and responsibilities, and areas of focus through bylaws and operating procedures	Fort Wolters, City of Mineral Wells							
	Communication and Coordination	Convene at least a yearly session of the coordinating body and develop an email database for more frequent, informal communication	Fort Wolters, City of Mineral Wells							
	Land Use/Physical Security	Conduct mapping to determine the area of JAZ Board land use authority around Fort Wolters	City of Mineral Wells, Palo Pinto County, Parker County							
	Land Use/Physical Security	Based on feasibility of a JAZ Board, identify appointees for an airport zoning commission	City of Mineral Wells, Palo Pinto County, Parker County							
	Land Use/Physical Security	Conduct more detailed compatible land use mapping in the area of authority	City of Mineral Wells, Palo Pinto County, Parker County							
	Land Use/Physical Security	Develop airport zoning regulations	City of Mineral Wells, Palo Pinto County, Parker County							
	Communication and Coordination	Create Ongoing Channels of Communications with Local Communities	Fort Wolters, City of Mineral Wells							
	Communication and Coordination	Develop Map of Noise Contour and Other Outreach Materials	Fort Wolters, Texas Military Department							
	Communication and Coordination	Coordinate Management of Lake Mineral Wells State Park	Fort Wolters, Texas Military Department							
	Communication and Coordination	Support H.B. 890 and Compatibility Studies	City of Mineral Wells, Palo Pinto County, Parker County							
	Energy Infrastructure	Coordinate Siting of Energy Infrastructure	City of Mineral Wells, Palo Pinto County, Parker County							

	Topic	Implementation Item	Lead	NCTCOG	NAS Fort Worth JRB	Texas Military Department	Parker County	Fort Wolters	Palo Pinto County	City of Mineral Wells
	Military Plans/Operations	Reporting Guidelines for Unexploded Ordnance	Fort Wolters, Texas Military Department							
	Physical Security	Educate Recreational Users about Risks Associated with Trespassing	Fort Wolters, Texas Military Department							
	Land Use	Use State of Texas Authority to Establish Joint Airport Zone (JAZ)	City of Mineral Wells, Palo Pinto County, Parker County							
Medium Priority	Communication and Coordination	Annual Briefing on Operations and Changes	Fort Wolters, Texas Military Department							
	Communication and Coordination	Conduct on-Installation Field Trips for Partners and Public	Fort Wolters, Texas Military Department							
	Economic Development	Increase Economic Development Efforts	City of Mineral Wells							
	Energy Infrastructure	Establish Permitting Process for Energy Infrastructure	City of Mineral Wells, Palo Pinto County, Parker County							
	Environmental/Cultural Resources	Collaborate with Conservation Partners for REPI, ACUB and Sentinel Landscape Partnership	Fort Wolters, Texas Military Department							
	Fire Management	Fire Management and Prevention	Fort Wolters							
	Physical Security	Enhance Installation Perimeter Security	Fort Wolters, Texas Military Department							
	Land Use	Voluntary Memorandum of Joint Consultation	City of Mineral Wells, Palo Pinto County, Parker County, Fort Wolters							
	Land Use	Reduce Bird Attraction	City of Mineral Wells, Palo Pinto County, Parker County							
	Local Government Plans	Invite Military and JF Partners to Participate in Planning Advisory Boards	City of Mineral Wells, Palo Pinto County, Parker County							
	Military Plans/Operations	Brief Visiting Military Units on Noise Mitigation Procedures	Fort Wolters							
	Noise Management/Avoidance	Manage Off-installation Aviation Noise through Time Adjustments	Fort Wolters, NAS Fort Worth, JRB							
	Outdoor Lighting/Signs	Explore Dark-Sky Provisions	City of Mineral Wells, Palo Pinto County, Parker County							
Low Priori	Communication and Coordination	Invite Military Representatives to Sit as Non-Voting Members of Commissions	City of Mineral Wells, Palo Pinto County, Parker County							
	Communication and Coordination	Welcome Packet for New Residents on Base Operations	Fort Wolters, Texas Military Department							
	Land Use	Use Capital Improvement Planning to Shape Growth Patterns	City of Mineral Wells							
	Local Government Plans	Incorporate JLUS Recommendations in Comprehensive Plans	City of Mineral Wells, Palo Pinto County, Parker County							
	Military Plans/Operations	Conduct Analysis on Changes in Noise Impact	Fort Wolters, Texas Military Department, NAS Forth Worth, JRB							
	Noise Management/Avoidance	Adopt Sound Attenuation Standards	City of Mineral Wells, Palo Pinto County, Parker County							

	Topic	Implementation Item	Lead	NCTCOG	NAS Fort Worth JRB	Texas Military Department	Parker County	Fort Wolters	Palo Pinto County	City of Mineral Wells
t y	Noise Management/Avoidance	Connect Homeowners to Energy Efficient Resources to Mitigate Sound	City of Mineral Wells, Palo Pinto County, Parker County							
	Outdoor Lighting/Signs	Coordinate with Fort Worth on Billboard Placement	City of Mineral Wells, Palo Pinto County, Parker County							
	Outdoor Lighting/Signs	Retrofit Older, Unshielded Lighting Applications	City of Mineral Wells, Palo Pinto County, Parker County							
	Transportation	Upgrade Road Network around Fort Wolters	NCTCOG, TxDOT							

	Not Started
	Completed
	In Progress

Joining Forces Implementation Action Summary

Regional

At the beginning of 2018, the North Central Texas Council of Governments (NCTCOG) created the Unmanned Aircraft System (UAS) Safety and Integration Initiative that establishes a Task Force to promote educational outreach and technical assistance to local law enforcement concerning the use of UAS near military installations. Subsequently, a meeting with the Texas Military Department Leadership was conducted earlier this year as an overview of aviation trends and mission changes of the regional installations.

The Regional Coordination Committee (RCC) continues to meet quarterly to discuss Joint Land Use Study (JLUS) strategies and coordination between communities and operations. In April 2018, the RCC invited the Alamo Area Council of Governments JLUS staff for a presentation about their current JLUS implementation strategies.

The RCC provided a letter of support for Operational Beddown of the Air Force Reserve Command F-35A mission at the 301st Fighter Wing at Naval Air Station Fort Worth Joint Reserve Base. The movement of the F-35s has an economic benefit to the region, and we look forward to what the EIS statement reveals since we continuously strive for compliance with NAAQS standards.

Naval Air Station Fort Worth Joint Reserve Base

The NAS FW JRB, in coordination with NCTCOG, developed a draft JLUS brochure, which updates current outreach materials and can be used as a welcome packet for new base residents on missions and communication with RCC cities. The brochure is available in Spanish.

Concerning Land Use, the city of Lake Worth adopted an overlay ordinance in their Comprehensive Plan that discourages single and multi-family residential developments in parcels located in the Accident Potential Zone II, directly North of the Base. Compatible land use strategies can also be found in the City of Benbrook's Comprehensive Plan and the City of Fort Worth's amended Building Codes. Along with land use planning, the Development Review Tool has had eleven new developments entered for comments. NCTCOG provides a follow-up letter on each development that summarizes sound attenuation measures that may need to be taken.

The RCC held a legislative subcommittee on January 22, 2018, to discuss upcoming legislative actions the RCC wants to take during the legislative session. Issues such as UAS flying over installations, Dark Sky Provisions, real estate disclosures and funding were discussed. NCTCOG will monitor and support the Office of Economic Adjustment Defense Authorization Bill, which supports funding for JLUS and implementation efforts.

Meanwhile, improvements to Meandering Way are currently in the design phase, and Las Vegas Trail is still in the process of finding a funding source. State Highway 199 and State Highway 183 Phase II are in the design and planning process.

RTAHP and Communities

At the latest briefing of the Texas Military Department, movement of the entrance gates to the northeast side of RTAHP was discussed. The movement would reduce conflicts with nearby residential neighborhood.

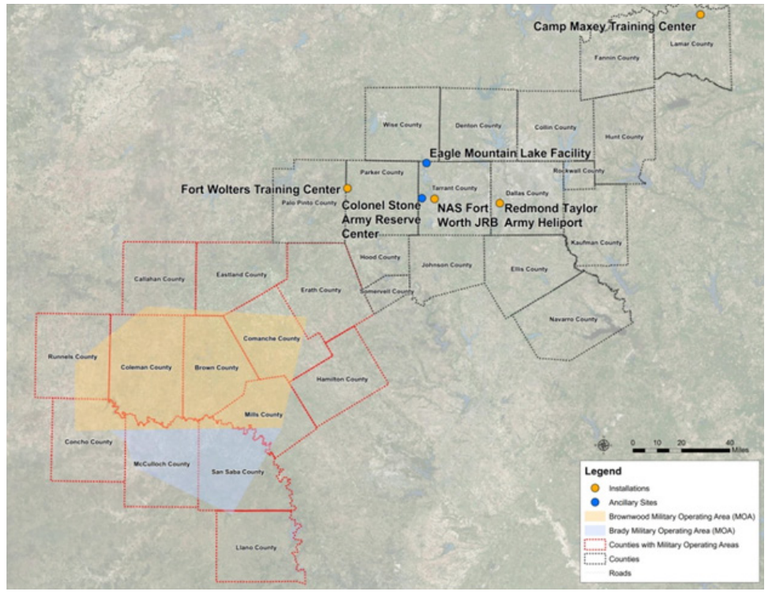
Next Steps

While the *Joining Forces* report recommends numerous compatibility strategies, successfully protecting and enhancing the military missions and defense communities of North Texas will require the work and cooperation of many stakeholders in the years ahead.

You can follow the next steps in the process and learn about issues and available technical resources at:

https://www.joiningforcesntx.org/

For more information about *Joining Forces* contact Amanda Wilson, North Central Texas Council of Governments, at AWilson@nctcog.org or (817) 695-9284.



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JOINING FORCES

Aligning Community & Military Missions

Regional Joint Land Use Study

Study Background

The State of Texas has one of the highest numbers of military personnel and installations in the United States. North Texas is a key part of this long and rich military tradition. The region has a mix of bases, military training facilities, and related airspace that prepare military personnel from all Service branches and the National Guard for combat, disaster relief, and other missions. *Joining Forces* looks to strengthen ties and build lasting cooperative partnerships between defense communities and the military.

Significant military facilities in North Texas are:

- Naval Air Station Fort Worth Joint Reserve Base (NAS Fort Worth JRB)
- Redmond Taylor Army Heliport (RTAHP)
- Fort Wolters Training Center
- Camp Maxey Training Center

The region also has support sites at the Eagle Mountain Training Center and Colonel Stone Army Reserve Center. Additionally, aircraft from NAS Fort Worth JRB and other installations train within the airspace of the Brownwood and Brady Military Operating Areas (MOAs). **See map.**

These military facilities provide critical ground- and air-based training opportunities for active and reserve units. Beyond training, the installations contribute significantly to the growing economies of the state and region. Installations and military personnel create jobs and spend billions of dollars in local economies. With a strong military presence, the Dallas-Fort Worth area has become a top hub for aviation and aerospace companies. Lockheed Martin is assembling the next generation of aircraft, the Joint Strike Fighter, at its Fort Worth plant.

A wide range of partners guided the *Joining Forces* planning effort as part of Policy Committees:

- North Central Texas Council of Governments
- Ark-Tex COG
- City of Grand Prairie
- City of Dallas
- City of Mineral Wells
- City of Paris
- City of Benbrook
- City of Fort Worth
- City of Lake Worth
- City of River Oaks
- City of Sansom Park
- City of Westworth Village
- City of White Settlement
- Tarrant County
- Mineral Wells Area Chamber of Commerce
- Lake Mineral Wells State Park/Texas Parks & Wildlife
- NAS Fort Worth JRB
- Camp Maxey
- Fort Wolters
- Redmond Taylor Army Heliport
- Texas Military Department – TX Army National Guard
- Palo Pinto County
- Mineral Wells/Palo Pinto County Area Growth Council
- Natural Resources Conservation Service
- Lamar County

The purpose of the Joining Forces Joint Land Use Study (JLUS) is to protect current and future military missions, while maintaining safety and economic vitality in surrounding communities.

Camp Maxey Gate Source: Handbook of Texas Online, www.tshaonline.org/handbook; Camp Maxey

Fort Wolters Entrance
Source:

Joining Forces Study

Residents in portions of 18 counties and more than 60 communities live near military training operations in North Texas. The Dallas-Fort Worth area is one of the fastest growing in the country, meaning that more people will live and work near military installations in the future.

The purpose of the *Joining Forces* Joint Land Use Study (JLUS) is to protect current and future military missions, while maintaining safety and economic vitality in surrounding communities. A JLUS is a cooperative effort among local governments, military installations, citizens, and other stakeholders to reduce and prevent encroachment. Encroachment happens when the way a community develops limits the ability of the military to perform its mission safely and effectively, or when military operations negatively affect quality of life in nearby areas. Many conditions can encroach on installations and communities, including noise, transportation, energy infrastructure, and aircraft/drone conflicts.

USAF aircraft flies over Fort Worth, Texas
Source: Tech. Sgt. Charles Hatton, USAF - U.S. Air Force photo 090112-F-4609H-083 from the 136th Airlift Wing website

F-35B and F-35C aircraft fly together over Fort Worth, Texas
Source: Lockheed Martin

Issues such as renewable energy production and drones have presented challenges to compatibility in recent years. Low-flying military aircraft can collide with wind turbines and transmission-line towers. Turbines can also interfere with air traffic control and aircraft radar systems. Small drones flying near airfields or training areas could create conflicts with aircraft or pose safety and security threats for military personnel.

Joining Forces was part of a year-long effort among Policy Committee members, residents, and other stakeholders to identify encroachment issues and develop strategies that make installations and communities good neighbors.

Study Outcomes

The *Joining Forces* report is an advisory document that offers strategies for state and local governments, regional agencies, military installations, non-profit groups, and other stakeholders. Partners can adopt the recommendations that meet their interests, needs, and priorities. Some *Joining Forces* strategies are specific to a particular installation or community, while other actions address issues that are common to military training areas across the region. A specific goal of the *Joining Forces* effort is to plan comprehensively for all of the region's military installations and give the defense communities of North Texas a coordinated voice at the state and federal level.

Among the major recommended actions are:

- Raise awareness of the security and safety risks from drones near airfields and military facilities
- Create a region-wide forum for communication and advocacy of the military missions, installations, and training assets across North Texas
- Create and enhance formal, ongoing channels of communication and coordination between military installations and communities with the goal of minimizing encroachment on military operations
- Work with federal, state, and local authorities around military installations to reduce the risk of recreational users crossing onto military training lands
- Advocate for local government authority to control land use on unincorporated land near military installations and training areas
- Consult with energy developers on the placement of energy infrastructure to avoid interference with aircraft and communication systems

You can find all of the recommendations of the *Joining Forces* report and supporting technical work at:

https://www.joiningforcesntx.org/

COMPATIBLE DEVELOPMENT

NAS Fort Worth JRB strives to be a good neighbor while conducting critical training missions to prepare our nation's military forces for deployment across the globe. Cities around the base are growing and there is a need to develop in a way that is compatible with the military mission. To protect public health, safety, and welfare, land use should be compatible with airfield noise zones and accident potential zones (APZs). Land use activities outside of the installation boundaries fall under the jurisdiction of local governments and can have impacts on military installations.

JLUS STUDY

Completed in 2017, *Joining Forces* has been a collaborative process among local governments, military installations, citizens and other stakeholders to identify and help mitigate and prevent encroachment issues that may affect current and future military missions and nearby communities. Encroachment occurs when conditions outside the military installation limit the ability of the military to perform its mission safely and effectively, or when military operations diminish qualify of life in surrounding areas.

This study built on work begun following a similar study in 2008 and examined the progress made towards greater compatibility and made further recommendations to balance the needs of the military and the community.

Following an in-depth study, discussions with stakeholders and public meetings, ongoing compatibility issues were identified for both the area surrounding NAS Fort Worth JRB as well as larger regional issues in North Texas and beyond. Once the issues were identified, recommended strategies were developed to make continued improvement towards compatibility. These recommendations are voluntary for communities surrounding the base.

The full report, including the full list of recommendations is available at **www.JoiningForcesNTX.org**.

The JLUS program was developed by the Department of Defense as a cooperative land use planning effort between affected local government(s) and military installations. The JLUS program is designed to provide a cooperative environment within which present and future land development and land use decisions can be made.

JOINING FORCES

Aligning Community & Military Missions

A Joint Land Use Study (JLUS) for
Naval Air Station Fort Worth
Joint Reserve Base and
Surrounding Communities

REGIONAL OVERVIEW

The North Texas region is one of the nation's most diverse and dynamic economies. Significant industry clusters include aviation/aerospace, finance, healthcare, high technology, logistics and manufacturing.

Military-related facilities are also major contributors to the region's diverse economy. Installations provide direct jobs to military personnel, contractors, civilians and support staff. Additionally, veterans compose a substantial percentage of the population, making up 6.5 percent of civilians age 18 or older in the 12-county DFW region.

ECONOMIC GENERATOR

Thr primary responsiibility of NAS Fort Worth JRB is to ensure combat readiness by training and equipping aircrews and aviation ground-support personnel. The base hosts over 45 tenant commands that represent the US Navy, US Marine Corps, US Army, US Air Force and Texas Air National Guard. The approximately 10,000 personnel operating at the 2,300-acre base conduct an average of 2,000 air operations each month.

Regionally, NAS Fort Worth JRB generates an estimated $6.6 billion in goods and services. The installation supports jobs for 17,266 people and provides direct and indirect employment to 47,256 workers. The presence of the base and nearby Lockheed Martin has elevated the region to a top aviation and aerospace hub. From 2004 through 2014, military employment in Tarrant County increased by 6 percent. Supporting the military mission is vital to the economies of Texas and the DFW region.

BUILDING ON SUCCESSES

For a decade, this issue of compatible development has been central to NAS Fort Worth JRB and nearby municipalities:

Benbrook	Sansom Park
Fort Worth	Westworth Village
Lake Worth	White Settlement
River Oaks	Tarant County

A 2008 JLUS concluded with 17 voluntary recommendations. Two key outcomes focused on quality of life enhancements benefitting nearby residents and encouraging compatible development to preserve abilities of the military's missions. For recommendations which have been fully implemented, the most successful was creation of the Regional Coordination Committee (RCC).

The RCC works collaboratively to discuss current and future land use decisions, encourage infrastructure improvements and advocate for supportive policies at the local, State and national levels.

Many RCC successes are shown on the map in the inside of this brochure. The map also displays a Joining Forces analysis illustrating the development in the area since the 2008 study. A positive trend in compatibility was identified through land use decisions and communications as a result of the RCC.

All photos courtesy of NAS Fort Worth JRB Public Affairs.

HIGHLIGHTED IMPLEMENTATION ACTIONS FROM THE 2008 STUDY

Form Regional Coordination Committee	✓
Updates to city future land use plans to address compatibility	✓
Add overlay zoning to encourage compatibility	✓
Update building codes to enhance sound attenuation	✓
Enhance stormwater drainage to prevent flooding	✓
Real estate disclosure for property sales	✓
Surface transportation improvements	✓
Commercial vehicle inspection gate (complete)	
Main gate improvements (complete)	
Meandering Road (funded)	
SH 199 (funded)	
SH 183 (planned)	

JOINING FORCES GOALS

The 2017 Joining Forces study focused on four goals to continue to build on the RCC's successes. The study sought to balance the region's strong population growth and development with protection of military operational capabilities; address encroachment issues associated with emerging technologies, such as renewable energy and unmanned aircraft systems; maintain the long-term viability and positive economic impact of military facilities in North Texas; and carry forward recommendations from the prior study and foster additional partnerships across installations and communities throughout the region and across Texas. The following page shows the top recommended strategies from the 2017 study.

HIGH-PRIORITY, SHORT-TERM STRATEGIES

- Identify "no fly zones" for drones and provide education to the public.
- Continue communicating among local governments and NAS Fort Worth JRB regarding development, including zoning overlays and tools that facility dialogue.
- Provide better information to real estate agents and home buyers through the real estate seller's disclosure form as well as "welcome packets" of what to expect living near a military installation.
- Coordinate with energy companies on the siting of energy infrastructure.
- Explore land conservation, or easements, where appropriate.
- Enhance new and existing buildings with sound attenuation to improve compatibility with the Navy's guidelines.
- Maintain and improve flood control infrastructure and utilize techniques to reduce storm water.
- Continue implementing priority transportation improvements.
- Pursue statewide legislation to encourage compatibility.
- Hold a regional summit with other military installations in North Texas annually to share best practices and encourage efficient utilization of resources.

COMPATIBLE DEVELOPMENT SUCCESS AROUND NAS FORT WORTH JRB

In April 2018 the Lake Worth City Council adopted the 2035 Comprehensive Plan and Future Land Use Map, designating the portion of the city within APZ I as light industrial and commercial. This area is primarily residential at this time, but the new zoning will be for more compatible uses in the future.

The Lake Worth Watershed Greenprint identified lands that are most important for protecting and enhancing Lake Worth's water quality, as well as other related community driven open space goals through community engagement and state-of-the-art computer modeling. The two primary priority topics for the plan are water quality protection and recreation enhancement.

Previous studies identified flooding as an issue in the area. The US Army Corps of Engineers has made channel improvements to the Farmer's Branch Creek near the White Settlement City Hall. This, along with recent culvert maintenance, has improved flooding in the city as well as downstream near NAS Fort Worth JRB.

Joining Forces analyzed land use change since the 2008 JLUS study. While there were many parcels that developed or redeveloped, the vast majority became or remained compatible with Navy guidelines. By encouraging compatible development or utilizing sound attenuation, the communities are able to grow in a way that allows the military to continue its mission.

The analysis, highlighted in the table below, shows that as noise levels and accident potential get higher the share of residential land uses goes down, a positive contribution to compatibility.

Higher Noise Levels ▼

Noise Contour	Residential Share
65 db	24.5%
70 db	21.0%
75 db	12.4%
80 db	2.6%
85 db	0.0%

Safety Zone	Residential Share
APZ II	27.3%
APZ I	14.8%
CZ	0.71%

▼ Increased Safety Risk

State Highway 199 is a radial transportation corridor from downtown Fort Worth to the northwest portion of Tarrant County and is in need of modernization. An investment of $475 million is scheduled for SH 199 over the next 10-year period, with the design of the roadway changing to fit the context of different segments.

Meandering Road serves as the main access point for the NAS Fort Worth JRB east gate entrance. Around 1,800 vehicles enter this gate per day, but the number is higher on drill weekends. Improvements are funded and will include roadway reconstruction, enhanced drainage and potential intersection improvements.

State Highway 183 was identified as a corridor with outdated design, capacity and business access. Phase 1 of the study looked at the project through River Oaks. Phase 2 focused on improvements from the Trinity River south to IH 30. Phase 2 identified the need for intersection improvements, enhanced bicycle and pedestrian facilities and traffic signal retiming.

Communication between local governments and the base has helped solve some potential compatibility issues. Landscaping initially planted along a roadway south of the base would have attracted wildlife that could increase accident potential for aircraft in flight. After working with base personnel on options, new plants were installed that reduced bird attraction, but maintained the roadway beautification.

The Cities of Benbrook and Fort Worth have adopted overlay zoning in areas that fall within the safety zones and noise contours. This zoning helps ensure that development in these areas is compatible with Navy guidelines, allowing communities to grow in a way that works with the military mission.

Lake Worth

NAS Fort Worth JRB

<65 65 70 75 80 85

199 TEXAS 183 TEXAS 30 SPUR 580 377 20

Legend

- NAS JRB Boundary

AICUZ Boundaries

- NAS JRB Clear Zones
- Accident Potential Zone 1
- Accident Potential Zone 2

Noise Contours

- 65 dB+

Overlay Districts

- Benbrook (2012/2013)
- Fort Worth (2013)
- Fort Worth (2014)

Land Use Change

- Land Use Changed Between 2005 and 2015

City Limits

- Benbrook
- Fort Worth
- Lake Worth
- Lakeside
- River Oaks
- Sansom Park
- Westover Hills
- Westworth Village
- White Settlement

Other Features

- Major Roads
- Other Arterials
- Major Lakes

N

0 0.5 1 Miles

March 20, 2018

JOINING FORCES

RESOLUTION NO. 2018-02

RESOLUTION SUPPORTING THE IMPLEMENTATION OF JOINING FORCES, A JOINT LAND USE STUDY

WHEREAS, in 2008 the Joint Land Use Study was published to prevent encroachment and promote compatible land use involving the Cities of Benbrook, Fort Worth, Lake Worth, River Oaks, Westworth Village, and White Settlement, as well as Tarrant County, and to establish an oversight committee now known as the Regional Coordination Committee (RCC); and

WHEREAS, the 2017 Joint Land Use Study, *Joining Forces*, builds upon the Joint Land Use Study (2008) to include study areas in all of northern Texas such as the Naval Air Station Fort Worth Joint Reserve Base; Redmond Taylor Army Heliport (RTAHP); Fort Wolters Training Center; Camp Maxey Training Center; Eagle Mountain Training Center; Brownwood and Brady Military Operating Areas; and Colonel Stone Army Reserve Center; and,

WHEREAS, *Joining Forces* was created as a collaborative process among local governments, military installations, stakeholders, and citizens to identify and mitigate encroachment issues that may affect current and future military missions and surrounding communities and to establish a dialogue between these parties concerning common interests, education, planning; and,

WHEREAS, the new study addresses issues including aviation and airspace safety related to drones/unmanned aircraft systems (UAS), air pollution and emissions, the need for communication among all installations and defense communities, energy-related infrastructure, and noise management; and,

WHEREAS, recommendations in the study include working to increase awareness of security and safety risks associated with UAS operations, communicating with communities surrounding military installations, monitoring developments near installations to determine compatibility and coordination, and implementing or pursing compatible state legislation; and,

WHEREAS, collaboration between local governments, developers, stakeholders and military installations is essential for continued safety and overall success in military operations and limiting encroachment.

NOW, THEREFORE, BE IT HEREBY RESOLVED THAT:

Section 1. The City of Benbrook endorses and supports vital military installations throughout the North Central Texas Region.

Section 2. The City of Benbrook endorses and supports *Joining Forces* and its voluntary recommendations for local and state governments as well

as military installations to promote compatible development that protects public health, safety, and welfare, and the ability of the military to accomplish its vital training and operational missions.

Section 3. The City Benbrook supports coordination with communities and other local governments surrounding military installations in North Central Texas, and other study areas to implement compatibility strategies.

Section 4. The City Benbrook supports monitoring future developments in cities surrounding military installations to maintain compatible land use and safety.

Section 5. The City Benbrook reaffirms support for and participation in the Regional Coordination Committee and action it takes.

Section 6. This resolution shall be in effect immediately upon action.

PASSED AND ADOPTED this 1st day of March, 2018.

APPROVED:

Jerry B. Dittrich, Mayor

ATTEST:

Joanna King, City Secretary

A Resolution

NO. 4925-04-2018

SUPPORTING THE IMPLEMENTATION OF JOINING FORCES, A JOINT LAND USE STUDY

WHEREAS, in 2008 the Joint Land Use Study was published to prevent encroachment and promote compatible land use involving the Cities of Benbrook, Fort Worth, Lake Worth, River Oaks, Westworth Village, and White Settlement, as well as Tarrant County, and to establish an oversight committee now known as the Regional Coordination Committee (RCC); and

WHEREAS, the 2017 Joint Land Use Study, *Joining Forces*, builds upon the Joint Land Use Study (2008) to include study areas in all of northern Texas such as the Naval Air Station Fort Worth Joint Reserve Base; Redmond Taylor Army Heliport (RTAHP); Fort Wolters Training Center; Camp Maxey Training Center; Eagle Mountain Training Center; Brownwood and Brady Military Operating Areas; and Colonel Stone Army Reserve Center; and

WHEREAS, *Joining Forces* was created as a collaborative process among local governments, military installations, stakeholders, and citizens to identify and mitigate encroachment issues that may affect current and future military missions and surrounding communities and to establish a dialogue between these parties concerning common interests, education, planning; and

WHEREAS, the new study addresses issues including aviation and airspace safety related to drones/unmanned aircraft systems (UAS), air pollution and emissions, the need for communication among all installations and defense communities, energy-related infrastructure, and noise management; and

WHEREAS, recommendations in the study include working to increase awareness of security and safety risks associated with UAS operations, communicating with communities surrounding military installations, monitoring developments near installations to determine compatibility and coordination, and implementing or pursing compatible state legislation; and

WHEREAS, collaboration between local governments, developers, stakeholders and military installations is essential for continued safety and overall success in military operations and limiting encroachment.

FORT WORTH

NOW, THEREFORE, BE IT RESOLVED BY THE CITY COUNCIL OF THE CITY OF FORT WORTH, TEXAS:

Section 1. City of Fort Worth endorses and supports vital military installations throughout the North Central Texas Region.

Section 2. City of Fort Worth endorses and supports *Joining Forces* and its voluntary recommendations for local and state governments as well as military installations to promote compatible development that protects public health, safety, and welfare, and the ability of the military to accomplish its vital training and operational missions.

Section 3. City of Fort Worth supports coordination with communities and other local governments surrounding military installations in North Central Texas, and other study areas to implement compatibility strategies.

Section 4. City of Fort Worth supports monitoring future developments in cities surrounding military installations to maintain compatible land use and safety.

Section 5. City of Fort Worth reaffirms support for and participation in the Regional Coordination Committee and action it takes.

Section 6. This resolution shall be in effect immediately upon action.

Adopted this 3rd day of **April,** 2018.

ATTEST:

By: _____
Mary J. Kayser, City Secretary

FORT WORTH

RESOLUTION NO. 2018-16

RESOLUTION SUPPORTING THE IMPLEMENTATION OF JOINING FORCES, A JOINT LAND USE STUDY

WHEREAS, in 2008 the Joint Land Use Study was published to prevent encroachment and promote compatible land use involving the Cities of Benbrook, Fort Worth, Lake Worth, River Oaks, Westworth Village, and White Settlement, as well as Tarrant County, and to establish an oversight committee now known as the Regional Coordination Committee (RCC); and

WHEREAS, the 2017 Joint Land Use Study, *Joining Forces*, builds upon the Joint Land Use Study (2008) to include study areas in all of northern Texas such as the Naval Air Station Fort Worth Joint Reserve Base; Redmond Taylor Army Heliport (RTAHP); Fort Wolters Training Center; Camp Maxey Training Center; Eagle Mountain Training Center; Brownwood and Brady Military Operating Areas; and Colonel Stone Army Reserve Center; and,

WHEREAS, *Joining Forces* was created as a collaborative process among local governments, military installations, stakeholders, and citizens to identify and mitigate encroachment issues that may affect current and future military missions and surrounding communities and to establish a dialogue between these parties concerning common interests, education, planning; and,

WHEREAS, the new study addresses issues including aviation and airspace safety related to drones/unmanned aircraft systems (UAS), air pollution and emissions, the need for communication among all installations and defense communities, energy-related infrastructure, and noise management; and,

WHEREAS, recommendations in the study include working to increase awareness of security and safety risks associated with UAS operations, communicating with communities surrounding military installations, monitoring developments near installations to determine compatibility and coordination, and implementing or pursing compatible state legislation; and,

WHEREAS, collaboration between local governments, developers, stakeholders and military installations is essential for continued safety and overall success in military operations and limiting encroachment.

NOW, THEREFORE, BE IT HEREBY RESOLVED BY THE CITY COUNCIL OF THE CITY OF LAKE WORTH, TEXAS THAT:

SECTION 1. The City of Lake Worth endorses and supports vital military installations throughout the North Central Texas Region.

SECTION 2. The City of Lake Worth endorses and supports *Joining Forces* and its voluntary recommendations for local and state governments as well as military installations to promote compatible development that protects public health, safety, and welfare, and the ability of the military to accomplish its vital training and operational missions.

SECTION 3. The City of Lake Worth supports coordination with communities and other local governments surrounding military installations in North Central Texas, and other study areas to implement compatibility strategies.

SECTION 4. The City of Lake Worth supports monitoring future developments in cities surrounding military installations to maintain compatible land use and safety.

SECTION 5. The City of Lake Worth reaffirms support for and participation in the Regional Coordination Committee and action it takes.

SECTION 6. This resolution shall be in effect immediately upon action.

PASSED AND APPROVED this 10th day of April 2018.

CITY OF LAKE WORTH

By: _____
Walter Bowen, Mayor

ATTEST:

City of Lake Worth Corporate Seal State of Texas

_____
Monica Solko, City Secretary

RESOLUTION 2018-008

A RESOLUTION OF THE CITY COUNCIL OF THE CITY OF PARIS, TEXAS SUPPORTING THE IMPLEMENTATION OF JOINING FORCES, A JOINT LAND USE STUDY; MAKING OTHER FINDINGS AND PROVISIONS RELATED TO THE SUBJECT; AND PROVIDING AN EFFECTIVE DATE.

WHEREAS, in 2008 the Joint Land Use Study was published to prevent encroachment and promote compatible land use involving the Cities of Benbrook, Fort Worth, Lake Worth, River Oaks, Westworth Village, and White Settlement, as well as Tarrant County, and to establish an oversight committee now known as the Regional Coordination Committee (RCC); and

WHEREAS, the 2017 Joint Land Use Study, *Joining Forces*, builds upon the Joint Land Use Study (2008) to include study areas in all of northern Texas such as the Naval Air Station Fort Worth Joint Reserve Base; Redmond Taylor Army Heliport (RTAHP); Fort Wolters Training Center; Camp Maxey Training Center; Eagle Mountain Training Center; Brownwood and Brady Military Operating Areas; and Colonel Stone Army Reserve Center; and

WHEREAS, *Joining Forces* was created as a collaborative process among local governments, military installations, stakeholders, and citizens to identify and mitigate encroachment issues that may affect current and future military missions and surrounding communities and to establish a dialogue between these parties concerning common interests, education, and planning; and

WHEREAS, the new study addresses issues including aviation and airspace safety related to drones/unmanned aircraft systems (UAS), air pollution and emissions, the need for communication among all installations and defense communities, energy-related infrastructure, and noise management; and

WHEREAS, recommendations in the study include working to increase awareness of security and safety risks associated with UAS operations, communicating with communities surrounding military installations, monitoring developments near installations to determine compatibility and coordination, and implementing or pursuing compatible state legislation; and

WHEREAS, collaboration between local governments, developers, stakeholders and military installations is essential for continued safety and overall success in military operations and limiting encroachment.

NOW, THEREFORE, BE IT RESOLVED BY THE CITY COUNCIL OF THE CITY OF PARIS, TEXAS, THAT:

Section 1. The findings set out in the preamble to this resolution are hereby in all things approved.

Section 2. The City of Paris endorses and supports vital military installations throughout the North Central Texas Region.

Section 3. The City of Paris endorses and supports *Joining Forces* and its voluntary recommendations for local and state governments as well as military installations to promote compatible development that protects public health, safety, and welfare, and the ability of the military to accomplish its vital training and operational missions.

Section 4. The City of Paris supports coordination with communities and other local governments surrounding military installations in North Central Texas, and other study areas to implement compatibility strategies.

Section 5. The City of Paris supports monitoring future developments in cities surrounding military installations to maintain compatible land use and safety.

Section 6. This Resolution shall become effective immediately upon its passage.

PASSED AND APPROVED this 26th day of February, 2018.

Steven J. Clifford, M.D., Mayor

SEAL OF THE CITY OF PARIS
PARIS, TEXAS

ATTEST:

Janice Ellis, City Clerk

APPROVED AS TO FORM:

Stephanie H. Harris, City Attorney

City of Westworth Village
311 Burton Hill Road • Westworth Village, TX 76114
817.710.2500 • Fax 817.710.2501

Resolution 2018-02

A RESOLUTION OF THE CITY OF WESTWORTH VILLAGE, TEXAS, SUPPORTING THE IMPLEMENTATION OF JOINING FORCES, A JOINT LAND USE STUDY.

WHEREAS, in 2008 the Joint Land Use Study was published to prevent encroachment and promote compatible land use involving the Cities of Benbrook, Fort Worth, Lake Worth, River Oaks, Westworth Village, and White Settlement, as well as Tarrant County, and to establish an oversight committee now known as the Regional Coordination Committee (RCC); and

WHEREAS, the 2017 Joint Land Use Study, *Joining Forces*, builds upon the Joint Land Use Study (2008) to include study areas in all of northern Texas such as the Naval Air Station Fort Worth Joint Reserve Base; Redmond Taylor Army Heliport (RTAHP); Fort Wolters Training Center; Camp Maxey Training Center; Eagle Mountain Training Center; Brownwood and Brady Military Operating Areas; and Colonel Stone Army Reserve Center; and,

WHEREAS, *Joining Forces* was created as a collaborative process among local governments, military installations, stakeholders, and citizens to identify and mitigate encroachment issues that may affect current and future military missions and surrounding communities and to establish a dialogue between these parties concerning common interests, education, planning; and,

WHEREAS, the new study addresses issues including aviation and airspace safety related to drones/unmanned aircraft systems (UAS), air pollution and emissions, the need for communication among all installations and defense communities, energy-related infrastructure, and noise management; and,

WHEREAS, recommendations in the study include working to increase awareness of security and safety risks associated with UAS operations, communicating with communities surrounding military installations, monitoring developments near installations to determine compatibility and coordination, and implementing or pursing compatible state legislation; and,

WHEREAS, collaboration between local governments, developers, stakeholders and military installations is essential for continued safety and overall success in military operations and limiting encroachment.

NOW, THEREFORE, BE IT HEREBY RESOLVED THAT:

Section 1. The City of Westworth Village endorses and supports vital military installations throughout the North Central Texas Region.

Section 2. The City of Westworth Village endorses and supports *Joining Forces* and its voluntary recommendations for local and state governments as well as military installations to promote compatible development that protects public health, safety, and welfare, and the ability of the military to accomplish its vital training and operational missions.

Section 3. The City of Westworth Village supports coordination with communities and other local governments surrounding military installations in North Central Texas, and other study areas to implement compatibility strategies.

Section 4. The City of Westworth Village supports monitoring future developments in cities surrounding military installations to maintain compatible land use and safety.

Section 5. The City of Westworth Village reaffirms support for and participation in the Regional Coordination Committee and action it takes.

Section 6. This resolution shall be in effect immediately upon action.

AND IT IS SO RESOLVED.

PASSED AND APPROVED on this, the 13th day of February 2018.

CITY OF WESTWORTH VILLAGE

Michael R. Coleman, Mayor

ATTEST:

Brandy G. Barrett, City Secretary

APPROVED AS TO FORM AND LEGALITY:

Ashley D. Dierker, Attorney

WESTWORTH VILLAGE TEXAS

RESOLUTION NO. 2018.03.10
Resolution Supporting the Implementation of Joining Forces,
A Joint Land Use Study

WHEREAS, in 2008 the Joint Land Use Study was published to prevent encroachment and promote compatible land use involving the Cities of Benbrook, Fort Worth, Lake Worth, River Oaks, Westworth Village, and White Settlement, as well as Tarrant County, and to establish an oversight committee now known as the Regional Coordination Committee (RCC); and

WHEREAS, the 2017 Joint Land Use Study, *Joining Forces*, builds upon the Joint Land Use Study (2008) to include study areas in all of northern Texas such as the Naval Air Station Fort Worth Joint Reserve Base; Redmond Taylor Army Heliport (RTAHP); Fort Wolters Training Center; Camp Maxey Training Center; Eagle Mountain Training Center; Brownwood and Brady Military Operating Areas; and Colonel Stone Army Reserve Center; and,

WHEREAS, *Joining Forces* was created as a collaborative process among local governments, military installations, stakeholders, and citizens to identify and mitigate encroachment issues that may affect current and future military missions and surrounding communities and to establish a dialogue between these parties concerning common interests, education, planning; and,

WHEREAS, the new study addresses issues including aviation and airspace safety related to drones/unmanned aircraft systems (UAS), air pollution and emissions, the need for communication among all installations and defense communities, energy-related infrastructure, and noise management; and,

WHEREAS, recommendations in the study include working to increase awareness of security and safety risks associated with UAS operations, communicating with communities surrounding military installations, monitoring developments near installations to determine compatibility and coordination, and implementing or pursing compatible state legislation; and,

WHEREAS, collaboration between local governments, developers, stakeholders and military installations is essential for continued safety and overall success in military operations and limiting encroachment.

NOW, THEREFORE, BE IT HEREBY RESOLVED THAT:

Section 1. The City of White Settlement endorses and supports vital military installations throughout the North Central Texas Region.

Section 2. The City of White Settlement endorses and supports *Joining Forces* and its voluntary recommendations for local and state governments as well as military installations to promote compatible development that protects

public health, safety, and welfare, and the ability of the military to accomplish its vital training and operational missions.

Section 3. The City of White Settlement supports coordination with communities and other local governments surrounding military installations in North Central Texas, and other study areas to implement compatibility strategies.

Section 4. The City of White Settlement supports monitoring future developments in cities surrounding military installations to maintain compatible land use and safety.

Section 5. The City of White Settlement reaffirms support for and participation in the Regional Coordination Committee and action it takes.

Section 6. This resolution shall be in effect immediately upon action.

PASSED and APPROVED on the 13th day of March, 2018

Ronald A. White

Ronald A. White, Mayor

ATTEST:

Amy Arnold, TRMC, CMC

Amy Arnold, TRMC, CMC
City Secretary