Aligning Community & Military Missions

Technical Appendices

November 2017

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Technical Appendix A.

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
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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
	<u>PLMC</u>
NCTCOG	2008 JLUS
	PLMC
	SH 199 Corridor Master Plan
	SH 183 Corridor Master Plan

Agency/Jurisdiction	Plan or Code
Tarrant County	2008 JLUS
	<u>PLMC</u>
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	Lead: NCTCOG, NAS Fort	Designated NAAQS non-	Medium	Short to Mid
with National Ambient Air Quality Standards (NAAQS)	Worth JRB	attainment area		
	Supporting: Federal, state,			
	and local regulatory agencies			
Aviation and Airspace Safety				
Increase awareness of the multiple uses of regional airspace and establish an outreach and educational	Lead: NCTCOG, NAS Fort	Airspace in the 16-county	High	Short
process to reduce unintentional encroachment by private general aviation airspace users	Worth JRB	region of North Central		
Conduct specific outreach to general aviation pilots	Supporting: FAA, TxDOT,	Texas		
	Aviation Division			
Track trends in regional airspace use associated with military mission change and/or new aircraft, such as	Lead: NAS Fort Worth JRB,	Airspace in the 16-county	High	Short to Mid
the F-35:	Dallas-Fort Worth International	region of North Central		
Identify any areas of increasing air traffic volume or conflict, and collaborate with airports and	Airport, Dallas Love Field,	Texas		
aviation authorities to develop management actions to deconflict congested areas and maximize	Dallas Executive Airport,			
airspace safety and capacity	NCTCOG			
Update the North Central Texas General Aviation and Heliport System Plan with any additional	Supporting: FAA, TxDOT,			
mitigation strategies identified	Aviation Division			

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

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	Lead: NCTCOG	Joining Forces region	High	Short
forum for communication and advocacy of the military missions, installations, and training assets across	Supporting: Military			
North Texas and participate in statewide JLUS coordination:	Installations, City and County			
Convene a yearly forum of <i>Joining Forces</i> military and community stakeholders to communicate	Governments, Texas Military			
updates in missions and operational activities, identify common interests and available resources,	Department, Texas Military			
and jointly pursue legislative and funding opportunities	Preparedness Commission			
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.				

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

Strategy	Partners	Area	Priority	Time Frame
Create and maintain an accessible regional spatial database to track major physical obstructions and	Lead: NCTCOG	SUAs, MOAs, MTRs,	Medium	Mid
flight hazards, including utility-scale wind and solar infrastructure, transmission lines, gas wells, and	Supporting: Military	airfield clearance zones;		
communication towers:	Installations, City and County	drop zones; low-level		
• Produce maps to highlight the overlap of major infrastructure with key military aviation training	Governments, FAA	approach and departure		
areas		paths		
• 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				
Strengthen the existing DoD Siting Clearinghouse process and advocate for additional federal guidance to	Lead: Military Installations	SUAs, MOAs, MTRs,	Medium	Mid
assist in developing compatible energy projects:	Supporting: City and County	airfield clearance zones;		
• Encourage energy generation and transmission developers to obtain a Military Impact Statement	Governments, Texas Military	drop zones; low-level		
from the installation or Site Clearinghouse on proposed energy, and/or transmission projects, that	Department	approach and departure		
are near installations, military flight paths, or may interfere with air traffic control and onboard		paths		
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				
Land Use			1	
Develop a toolbox of land use, development, and infrastructure regulatory options available under current	Lead: NCTCOG	SUAs, MOAs, MTRs, airfield	Medium	Mid
State of Texas law to assist county governments in maximizing their ability to shape compatible	Supporting: County	clearance zones; drop		
development patterns in unincorporated areas near military operations	Governments	zones; low-level approach		
		and departure paths		

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

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

JOINING FORCES Regional Joint Land Use Study

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

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)

JOINING FORCES Regional Joint Land Use Study

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

Regional Joint Land Use Study

JOINING FORCES

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

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

Strategy	Partners	Area	Priority	Time Frame
Prepare and distribute a "welcome packet" with information on base	Lead: Fort Wolters, Texas Military Department	Areas with adjacency to	Low	Long
background, mission, and operations for incoming residents to promote	Supporting: City of Mineral Wells, Palo Pinto	range and airfield: airfield		
an understanding of operations and potential impacts	County, Parker County	clearance zones; drop		
		zones; low-level approach		
		and departure paths;		
		Surface Danger Zone;		
		and/or specified distance		
		from installation boundary		
Economic Development				
Identify strategic investments, such as improvements in infrastructure to	Lead: City of Mineral Wells	City of Mineral Wells	High	Mid
support a potential increase in installation capabilities at Fort Wolters	Supporting: Fort Wolters, Texas Military			
and/or compatible re-use of the Fort Wolters Industrial Park:	Department, Mineral Wells Area Chamber of			
Encourage partnerships between military representatives and	Commerce, NAS Fort Worth JRB			
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				

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

Strategy	Partners	Area	Priority	Time Frame
Environmental/Cultural Resources				
Collaborate with conservation partners, non-profit groups, and research	Lead: Fort Wolters, Texas Military Department	Conservation lands as	Medium	Mid
entities to identify areas with an overlap of military impact (e.g. noise or	Supporting: Natural Resources Conservation	identified near Fort Wolters		
safety risk) and natural/working lands/cultural value that thus may be	Service, Texas A&M University, Texas A&M AgriLife			
candidates for easement or fee-simple purchases through the Readiness	Extension Service; U.S. Fish & Wildlife Service, DoD			
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				
Fire Management				
Build on ongoing partnerships to coordinate fire prevention and	Lead: Fort Wolters	Areas with adjacency to	Medium	Mid
suppression strategies, including the implementation of fire breaks near	Supporting: Texas Forest Service, Natural	Fort Wolters range training		
training lands to reduce the risk of the spread of wildfires onto or off of	Resources Conservation Service; U.S. Fish & Wildlife	operations		
the installation	Service			

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

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

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

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

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

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

Abbreviations:

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

Time Frame:

Short 1 to 2 yearsMid 3 to 5 yearsLong 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**)

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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

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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

Regional Joint Land Use Study

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

Regional Joint Land Use Study

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

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

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

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

Strategy	Partners	Area	Priority	Time Frame
Environmental/Cultural Resources				
Drawing from City of Paris' Evaluation of all Natural and Man-Made	Lead: Camp Maxey, Texas Military Department	Conservation lands	Low	Long
Resources, collaborate with conservation partners, non-profit groups, and	Supporting: Natural Resources Conservation Service,	as identified near		
research entities to identify areas with an overlap of military impact (e.g.	Texas A&M University, Texas A&M AgriLife Extension	Camp Maxey		
noise or safety risk) and natural/working /cultural value that thus may be	Service; U.S. Fish & Wildlife Service, DoD			
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				
Fire Management				
Build on ongoing partnerships to coordinate on fire prevention and	Lead: Camp Maxey	Areas with	Medium	Mid
suppression strategies, including the implementation of fire breaks near	Supporting: Texas Forest Service, Natural Resources	adjacency to Camp		
training lands to reduce the risk of the spread of wildfires onto or off of	Conservation Service; City of Paris, Lamar County	Maxey range		
the installation		training operations		

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

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

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

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

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

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

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Regional Joint Land Use Study

Abbreviations:

MOAs - Military Operating Areas

ACUB - Army Compatible Use Buffer	MTRs - Military Training Routes
AICUZ - Air Installation Compatible Use Zone	NCTCOG - North Central Texas Council of Governments
COG - Council of Governments	REPI - Readiness and Environmental Protection Initiative
DoD – Department of Defense	RCC - Regional Coordination Committee
FAA – Federal Aviation Administration	RTAHP – Redmond Taylor Army Heliport
FCC – Federal Communications Commission	TCC - Texas Commander's Council
GIS - Geographic Information System	TxDOT - Texas Department of Transportation
HB – House Bill	UAS - Unmanned Aircraft Systems
JAZ - Joint Airport Zone	USACE - U.S. Army Corps of Engineers
JLUS – Joint Land Use Study	

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

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

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

Strategy	Partners	Area	Priority	Time Frame
Frequency and Spectrum Management				
Identify "Exclusion Zones" for military Navigational Aid (NAVAID) protection to assist local	Lead: NAS Fort Worth JRB	Designated Exclusions Zones	High	Mid
governments in siting decisions:	Supporting: Muncipalities, Tarrant	as identified		
Provide guidelines and maps of exclusion zones and notification areas to city and county	County, NCTCOG			
governments and relevant state agencies				
Pursue implementation of guidelines and exclusion zones in local zoning code				
Pursue state legislation to support notification areas				
Land Use				
Explore adoption of a land use/development regulatory overlay to promote compatibility within	Lead: Muncipalities	Areas inside AICUZ	High	Short to Mid
clearly defined planning zones, including noise contours, and airfield Accident Potential Zones	Supporting: NCTCOG, Tarrant			
	County			
Reduce bird attraction by 1) establishing siting and design standards for uses, such as detention	Lead: Muncipalities	Areas inside AICUZ; low-level	Medium	Mid
ponds, sanitary landfills, and crops in areas subject to low-level flights, 2) planting of vegetation and	Supporting: NAS Fort Worth JRB,	approach and departure paths;		
habitats compatible with missions at base, and 3) coordinating on Bird/Animal Aircraft Strike Hazard	Tarrant County, NCTCOG	and/or specified distance from		
(BASH) measures with resource management entities		airfield		
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				

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

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

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	Lead: Muncipalities, Tarrant County	Areas inside AICUZ; low-level	High	Medium
applications for major new developments (e.g. commercial, industrial uses, airports and airfields,	Supporting: NAS Fort Worth JRB	approach and departure path		
outdoor sports stadiums) near military airfields				
Coordinate with military installations on the siting and design of digital billboards and light-emitting	Lead : Muncipalities, Tarrant County	Areas inside AICUZ; low-level	Medium	Short
diode (LED) lighting in airfield flight paths to reduce visual distraction of pilots	Supporting: NAS Fort Worth JRB	approach and departure paths		
Encourage the retrofitting of older, large-scale unshielded lighting applications (e.g. big-box	Lead: Muncipalities, Tarrant County	Areas inside AICUZ; low-level	Low	Long
commercial, major industrial uses, airports and airfields, outdoor sports stadiums) through an	Supporting: NAS Fort Worth JRB	approach and departure paths		
outreach campaign and use of energy efficiency incentives				
Physical Security				
Explore opportunities to enhance installation perimeter security and entry control points at NAS Fort	Lead : Muncipalities, Tarrant County	Areas of NAS Fort Worth, JRB	Medium	Mid
Worth JRB	Supporting: NAS Fort Worth JRB	with adjacency to public lands		
Coordinate with RCC members to reduce the risk of trespass onto NAS Fort Worth JRB from		or public access points		
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				

Strategy	Partners	Area	Priority	Time Frame
Stormwater/Drainage				
Strengthen awareness and promote the implementation of iSWM strategies and LID techniques to	Lead: NCTCOG	Watershed	High	Short
reduce flooding risks across the watershed	Supporting: Muncipalities, Tarrant			
Conduct community outreach on the effects of additional impervious areas on stormwater	County			
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				
Increase the capacity and function of existing stormwater infrastructure through the re-grading of	Lead: TxDOT, City of White	Watershed	High	Short to Mid
ditches and cleaning out culverts along highway corridors and the implementation of engineering	Settlement, City of Fort Worth	NAS Fort Worth JRB		
improvements in storm drain inlets and upstream and on-system capture areas	Supporting: Tarrant County			
Clearly define ongoing operation and maintenance responsibilities				

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

Strategy	Partners	Area	Priority	Time Frame
Transportation				
Continue implementing priority transportation and mobility projects to enhance access into and	Lead: Muncipalities, Tarrant	Areas of NAS Fort Worth JRB	High	Short to Mid
around NAS Fort Worth JRB and surrounding communities, including planned improvements to	County, NCTCOG, TxDOT	with adjacency to public		
Meandering Road and the SH 183 and 199 corridors	Supporting: NAS Fort Worth JRB	access points		
Alleviate traffic congestion issues on base and in the surrounding communities through measures	Lead: NAS Fort Worth JRB	Areas of NAS Fort Worth JRB	Medium	Short to Mid
such as:	Supporting: Muncipalities, Tarrant	with adjacency to public		
Continuing joint coordination of drill weekend schedules	County, NCTCOG, TxDOT, private	access points		
Promoting alternative transportation and flexible work hours	sector			
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				

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**)

JOINING FORCES Regional Joint Land Use Study

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

JOINING FORCES

Regional Joint Land Use Study

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	Lead: RTAHP	Airfield clearance zones; low-level	High	Short
UAS activity	Supporting: City of Dallas, City of Grand	approach and departure paths;		
	Prairie, Dallas County	and/or specified distance from		
		airfield		
Communication and Coordination				
Continue briefings with regional partners to build support and strengthen engagement in	Lead: NCTCOG	City of Dallas, City of Grand	High	Short
ongoing Joining Forces compatibility implementation activities	Supporting: City and County	Prairie, Dallas County		
	Governments			
RTAHP to enhance its participation in established channels of communication regarding	Lead: RTAHP, City of Dallas, City of Grand	City of Dallas, City of Grand	High	Short
major community actions, such as proposed zoning changes, that have potential	Prairie	Prairie, Dallas County		
compatibility impacts:	Supporting: NCTCOG, Real Property -			
Leverage relevant existing meetings, communication methods, and points of	Texas Military Department, Dallas County			
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				

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

JOINING FORCES

Regional Joint Land Use Study

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

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

JOINING FORCES

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

JOINING FORCES

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

JOINING FORCES

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

JOINING FORCES

Regional Joint Land Use Study

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

Abbreviations:

AICUZ - Air Installation Compatible Use Zon	ne NCTCOG – North Central Texas Council of	Timeframe:
BASH - Bird/Animal Aircraft Strike Hazard	Governments	Short 1 to 2 years
DoD - Department of Defense	RCC - Regional Coordination Committee	Mid 3 to 5 years
FAA – Federal Aviation Administration	TCC - Texas Commander's Council	Long 5+ years
FCC – Federal Communications Commission	TxDOT - Texas Department of	- ,
MOAs - Military Operating Areas	Transportation	
MTRs - Military Training Routes	UAS - Unmanned Aircraft Systems	

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

Level of Operations	Installation/MOA	County Location	Location	Local
Level of operations			2004.011	Governments
Ancillary Sites	Eagle Mountain	Tarrant	Pecan Acres	Pecan Acres
,	Training Center		Census	Census
			Designated	Designated
			Place, TX	Place and
				Tarrant
				County
	Brownwood and	Portions of	Brownwood,	Portions of
	Brady Military	Brown,	TX	Brown,
	Operating Areas	Callahan,		Callahan,
		Coleman,		Coleman,
		Comanche,		Comanche,
		Concho,		Concho,
		Eastland,		Eastland,
		Erath, Llano,		Erath, Llano,
		Hamilton,		Hamilton,
		McCulloch,		McCulloch,
		Mills,		Mills, Runnels,
		Runnels, and		and San Saba
		San Saba		Counties
Low-Intensity	Colonel Stone	Tarrant	Fort Worth, TX	City of Fort
	Army Reserve			Worth;
Training/Maintenance	Center			Tarrant
Sites				County

Camp Maxey Training Center Fannin County Denton County **Eagle Mountain Lake Facility** Fort Wolters Training Center Colonel Stone NAS Fort Redmond Taylor Army Reserve Worth JRB Army Heliport Center Callahan County Concho County Legend Ancillary Sites Brownwood Military Operating Area (MOA) Brady Military Operating Area (MOA) Counties with Military Operating Areas Counties Roads

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 Re	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	City of Benbrook
Reserve Base	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. 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.

Camp Maxey Training Center Fannin County Hunt County Eagle Mountain Lake Facility Colonel Stone Army Reserve Center Fort Wolters Training Center NAS Fort Worth JRB Redmond Taylor Army Heliport Ellis County Eastland County Callahan County Coleman County **Brown County** Legend . Concho County Installations Ancillary Sites Brownwood Military Operating Area (MOA) Brady Military Operating Area (MOA) County Boundaries Urban Areas

Figure 2. Urbanized Areas, Joining Forces Region

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

Joining Forces: Regional Joint Land Use Study | Existing Conditions

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. 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 Abilene⁵. 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.

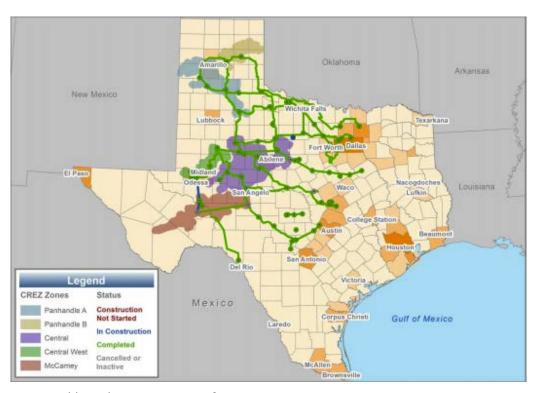


Figure 3. Competitive Renewable Energy Zones

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.

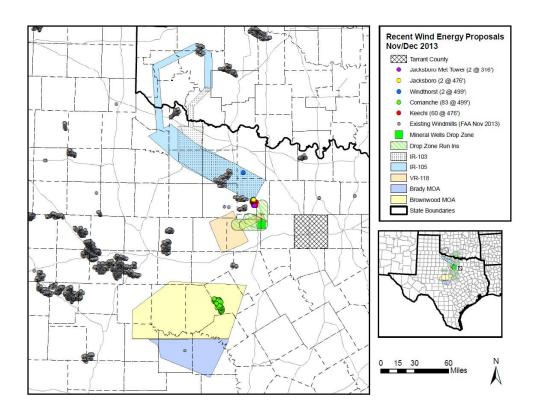


Figure 4. Wind Energy in Proximity to Airspace Training, 2013

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 subregion 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.

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



Source: Audubon Field Guide

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,	These sites include those with national	Texas Historical
districts, or	and/or state historic designations.	Commission
cemeteries		
Closed landfills	Permitted and unauthorized sites were	NCTCOG
	identified by Texas State University for	
	the Texas Commission on	
	Environmental Quality.	
Existing landfills	These sites are identified by NCTCOG	NCTCOG
	land use data.	
Streams	These sites include all feature types	National Hydrography
	identified by the medium resolution	Dataset
	dataset from the National Hydrography	
	Dataset.	
Impaired streams and	These sites include Category 5 impaired	Texas Commission on
lakes	waterbodies—those that don't meet	Environmental Quality
	standards for water quality or at least	
	one of their designated uses is	
	threatened by pollution.	
Lakes	These data include major lakes.	NCTCOG and National
		Hydrography Dataset
Wetlands and wet	Three datasets were combined to	National Wetlands
prairie	provide the most inclusive data possible.	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	Federal Emergency
	zones.	Management Agency
Parks or natural areas	These areas are natural areas or	NCTCOG and National
	designated local, state, or national parks	Land Cover Database
	that are potentially undevelopable.	
TNC Priority	These areas have been identified by The	The Nature
Conservation Areas	Nature Conservancy as priority areas to	Conservancy
	protect and preserve species and	
	ecological systems.	
Watershed Protection	These locations include existing and	Texas Commission on
Plans	planned watershed protection plans for	Environmental Quality
	non-point source water pollution.	
USGS Protected Areas	This inventory includes public parks and	U.S. Geological
Database	protected open space. Protected areas	Survey Gap Analysis
	that duplicated other layers were not	Program
	included.	
Brownfields	Contaminants, hazardous substances, or	Environmental
	pollutants may be located at these sites.	Protection Agency
		Region 6
TMDL Bacteria	The Greater Trinity River Bacteria TMDL	NCTCOG
Implementation Plan	Implementation Plan seeks to reduce	
	bacteria loading in river segments and	
	tributaries in the plan area.	
Conservation	These locations have been voluntarily	National Conservation
easements	submitted to the National Conservation	Easement Database
	Easement Database, which does not	
	include all conservation easements.	

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

Pat Mayse Lake Camp Maxey Legend Streams Wetlands, wet prairies Camp Maxey Significant stream segments Wildlife Management Areas Impaired stream Roads TNC Priority segments Conservation Areas Historic points, sites, Miles districts, cemeteries Lakes 0.75 FEMA flood zones Solid waste sites September 2, 2016

Figure 5. Environmental Features around Camp Maxey

Palo Pinto County Parker County Fort Wolters ake Mineral Wells Legend Streams Parks or natural areas Impaired streams TNC Priority Fort Wolters Conservation Areas Lakes Roads Wetlands Conservation easements Historic points, sites, districts, cemeteries FEMA flood zones Closed landfills Lake Granbury Watershed Counties September 2, 2016 Protection Plan

Figure 6. Environmental Features around Fort Wolters

Figure 7. Environmental Features around NAS Fort Worth, JRB

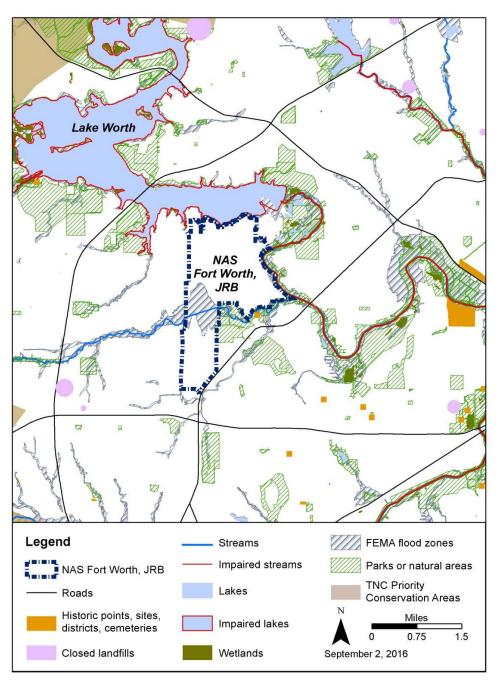
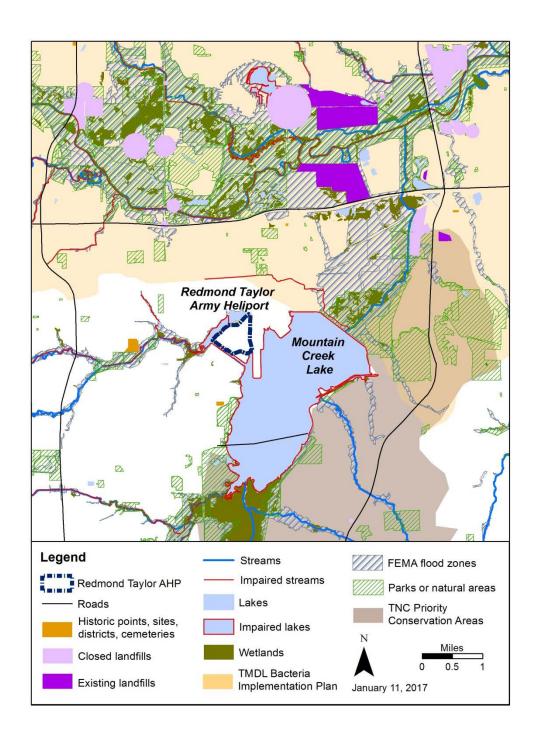


Figure 8. Environmental Features around Redmond Taylor Army Heliport

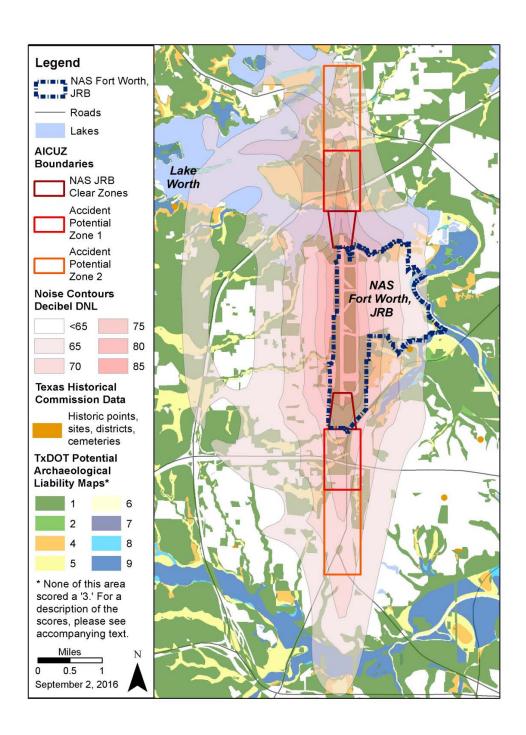


The presence or potential presence of archaeological resources in an area can also limit military and other activities, or place restrictions on them. **Figure 9** shows the results of a study around NAS Fort Worth, JRB to predict the relative likelihood that a location will contain prehistoric sites 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	Relative Likelihood
	Prehistoric Sites	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 onsystem 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.

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.

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.

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.

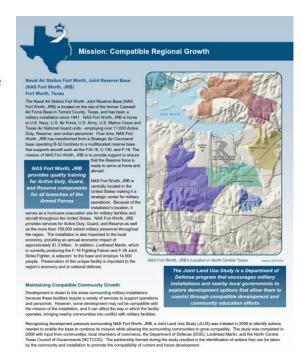
3.4.2 2008 Joint Land Use Study

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.

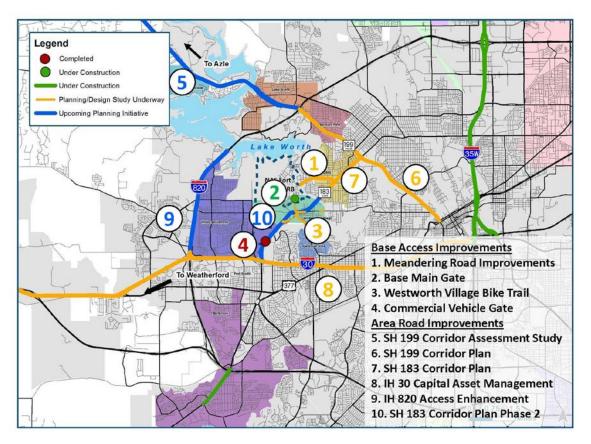
As a complementary effort to PLMC, NCTCOG also conducted a transportation assessment around NAS Fort Worth, JRB to facilitate safe and efficient access to the base and prevent further disruption of the area's overburdened transportation network.

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/installation s/nas_jrb_fort_worth.html

NAS Fort Worth JRB Legend Installation Major Roads Accident Potential Zone 1 Accident Potential Zone 2 Noise Contours decibels 65 70 80

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	Туре	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.

FM 3298 **Camp Maxey Training Center** Melani Legend Camp Maxey Training Center Paris Roads Cities Paris 55 SS 139 US 82 Counties CENTER ST Lamar County

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

JOINING FORCES

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

Taylor Army Heliport Legend Installation
Redmond Taylor
Army Heliport Major Roads Cities Dallas Grand Prairie

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



Source: AECOM

training center, along with industrial park uses, a branch of Weatherford College, and a summer camp for the Civil Air Patrol.

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 runins. 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.

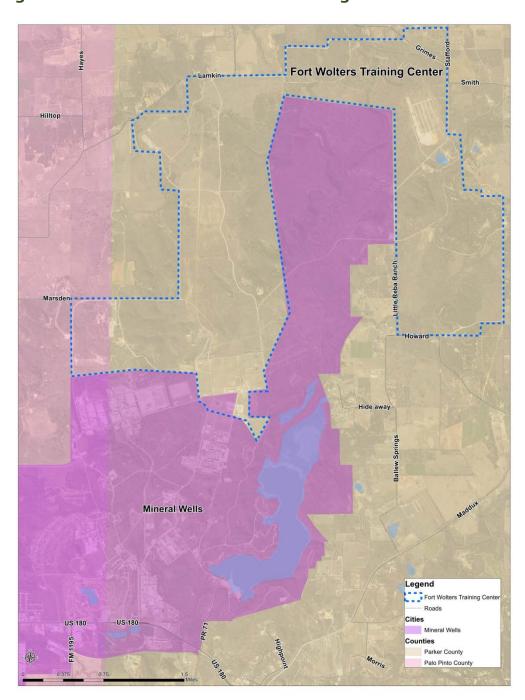


Figure 14. Fort Wolters and Surrounding Communities

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.

Eagle Mountain Lake Facility **Pecan Acres** Legend High Plains Eagle Mountain Lake Facility Census Designated Place Pecan Acres Wind Hill Tarrant County

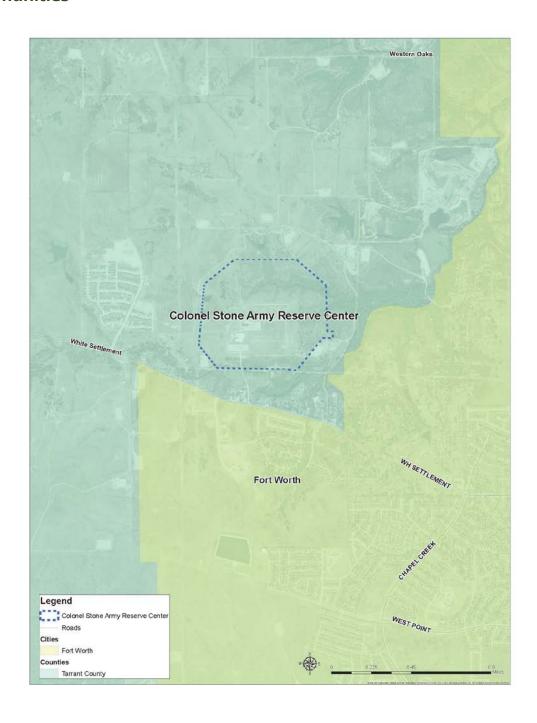
Figure 15. Eagle Mountain Lake Facility and Surrounding Communities

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.

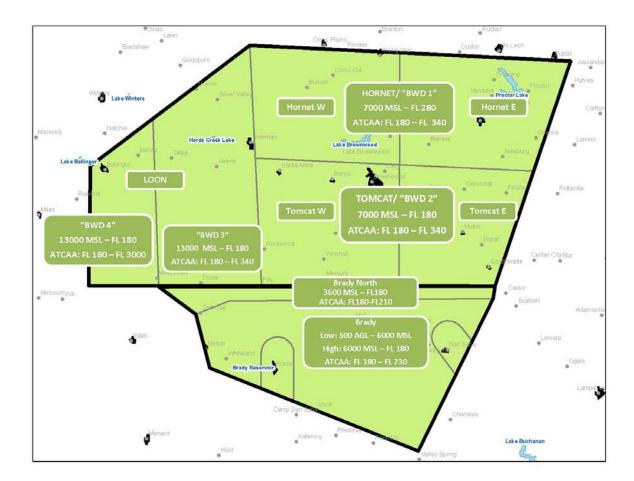


Figure 17. Brownwood and Brady MOAs

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

Figure 2: Local Military Training Routes Fort Wolters **NAS Fort** Richardso Worth JRB Dallas Fort Gra Worth Arlington Prai Weatherford • Parker Tarrant County County Abilene Hood Waxahachie County Erath Cleburne Johnson Eastland Ellis Dyess Air Callahan County County County Somervell County Hill County 1 MOA Comanche Brownwood Hamilton 3 MOA Goodfellow Brownwood Air Force Brownwood McLennan 2 MOA Mills San Angelo County 4 MOA • Hewitt Hood MOA Brady North MOA Tom Green Falls Concho County County County Hood Fort Hood Brady South County MOA Schleicher Bell County Burnet Military Operating Area City Miltary Flight Route Military Installation Georgetown Military Flight Corridor County Boundary Taylor

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	Mobility 2040
Metropolitan Area	
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.

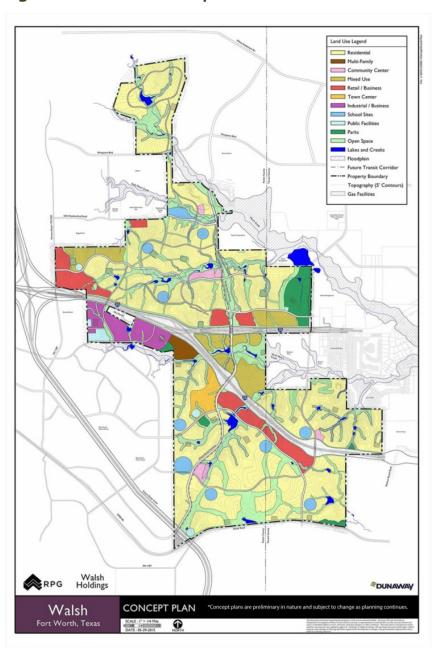
9.1.9 Tarrant County

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

Geog	rank	nic A	rea	Cover	ed
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Title

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

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,

Source: Lockheed Martin

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.

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 City of Benbrook

Parker County City of River Oaks

Westworth Village City of White Settlement

City of Grand Prairie Tarrant County

Natural Resources Conservation Service Lake Mineral Wells State Park

Palo Pinto County Lamar County

City of Mineral Wells City of Paris

Fort Worth U.S. Army Corps of Engineers

Lake Worth City of Dallas

Ark-Tex COG

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 mission 1.

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 Company².

Past Development

Much of the development in the AICUZ boundaries predates noise control legislation and military guidance on compatible growth, which date to the 1970s³ (**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 2015⁴, 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

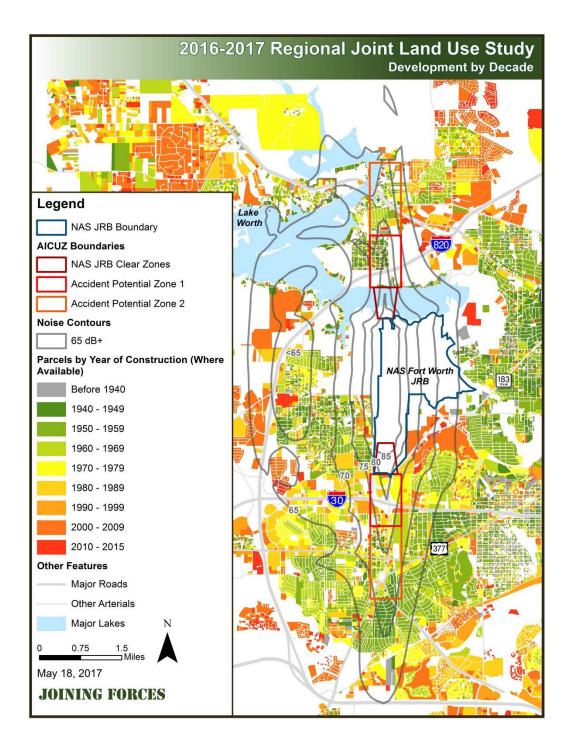


Figure 2

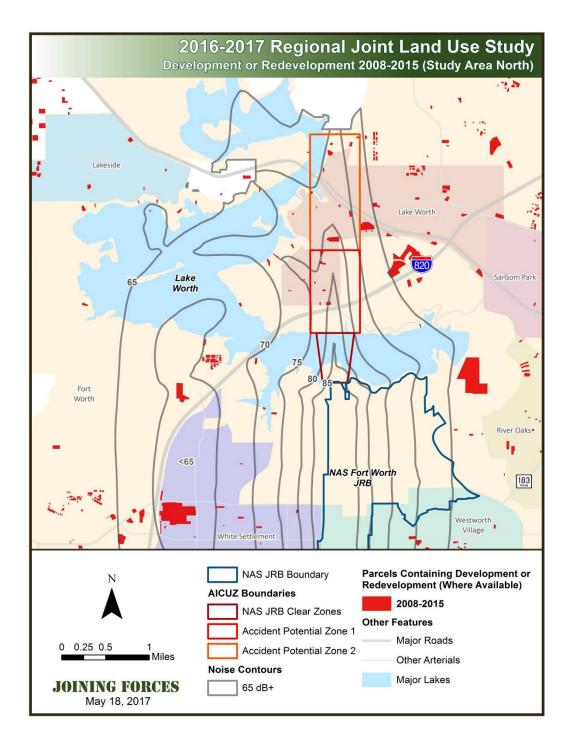
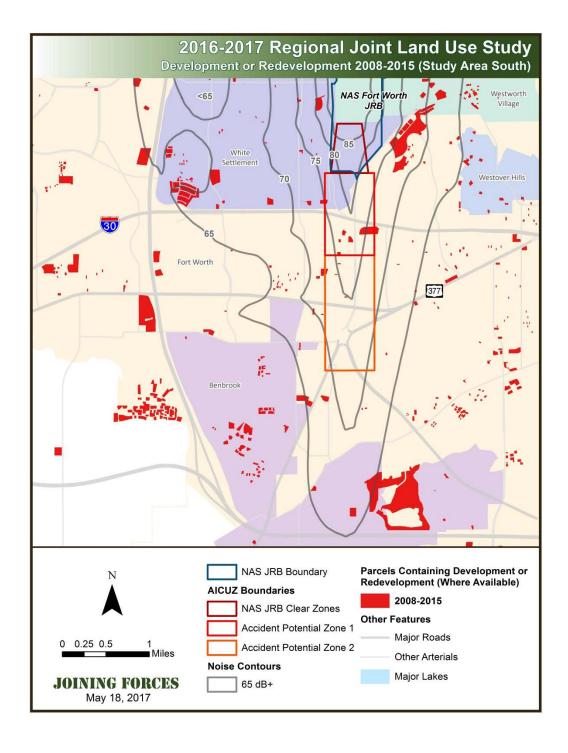


Figure 3



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**.

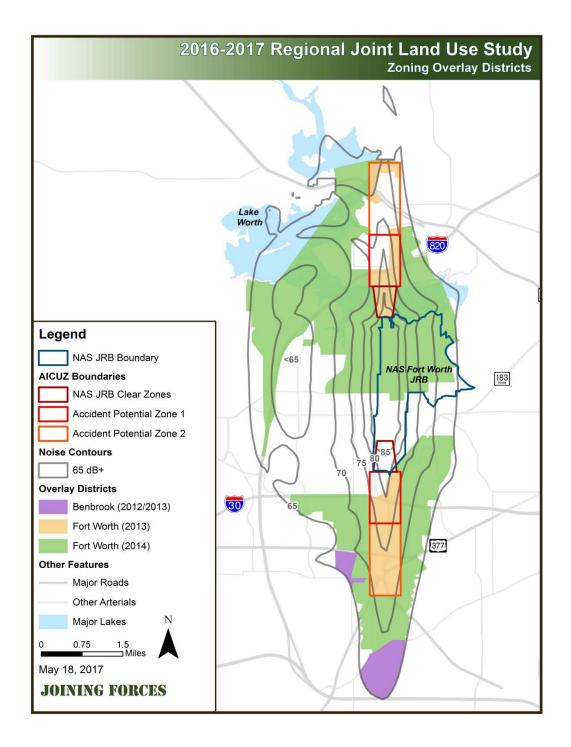
The City of Fort Worth also adopted an ordinance in 2016 that amended Appendix L of the city's Building Code requiring sound insulation for noise sensitive users near airports. Details on building materials for windows, walls, doors, and roof/ceiling are addressed. The Building Code requirements cover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



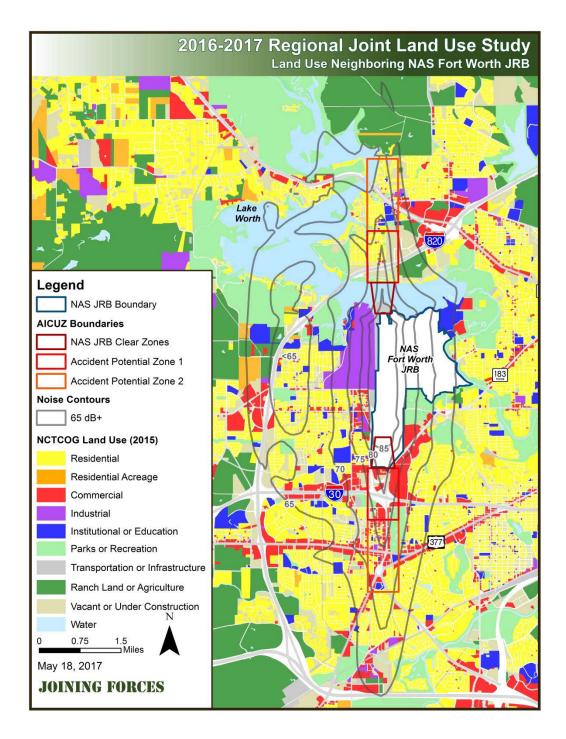
Current Land Use

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



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

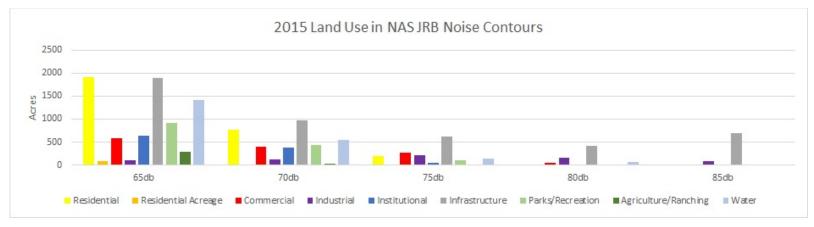


Figure 7

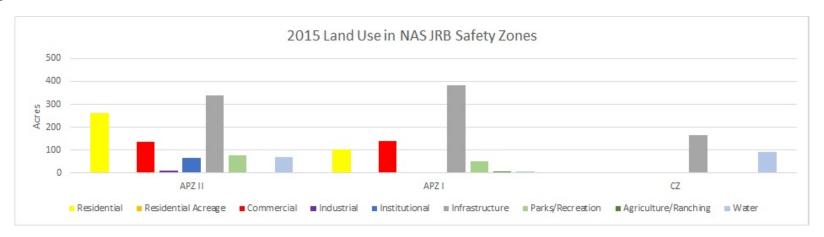
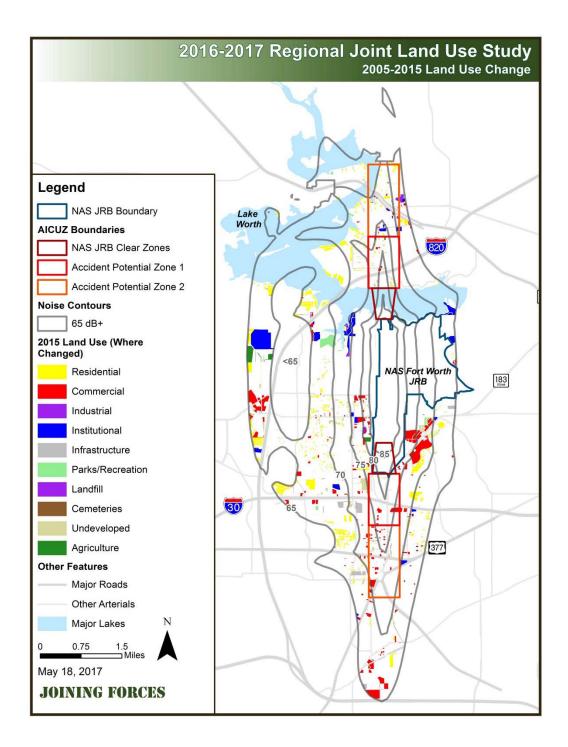


Figure 8



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	Sugg	Suggested Land Use Compatibility							
	Land Use	Noise	Zone	Noise 2	one 2	Nois	e Zone	3		
				(DNL or	CNEL)	(DNL or CNEL)				
		(DNL	or	'	,	,,				
		CNEL)				1				
SLUCM	LAND USE NAME	< 55	55- 64	65- 69	70 -74	75-	80-84	85+		
NO						79				
10	Residential			•	•					
11	Household Units	Y	Y1	N1	N1	N	N	N		
11.11	Single units, detached	Y	Y1	N1	N1	N	N	N		
11.12	Single units,	Y	Y1	N1	N1	N	N	И		
	semidetached									
11.13	Single units: attached row	Y	Y1	N1	N1	И	N	N		
11.21	Two units, side-by-side	Y	Y1	N1	N1	N	N	N		
11.22	Two units, one above the	Y	Y1	N ₁	N1	И	N	N		
	other									
11.31	Apartments: walk-up	Y	Y1	N1	N1	И	N	N		
11.3	Apartment: elevator	Y	Y1	N1	N1	N	N	N		
12	Group quarters	Y	Y1	N1	N1	N	N	N		
13	Residential Hotels	Y	Y1	N1	N1	N	N	N		
14	Mobile home parks or courts	Y	Y1	N	N1	N	N	N		
15	Transient lodgings	Y	Y1	N1·	N1	N1	N	N		
16	Other residential	Y	Y1	N1	N1	N	N	N		
20	Manufacturing			1						
21	Food & kindred products; manufacturing	Y	Y	Y	Y2	. A.3	Y4	N		
22	Textile mill products; manufacturing	Y	Y	Y	Y2	Х3	Y4	N		
23	Apparel and other finished products; products made from fabrics, leather and similar materials; manufacturing	Y	Y	Y	Y2	Ā3	Y4	И		
24	Lumber and wood products (except furniture); manufacturing	У	Y	Y	Ās	Д3	Y4	И		
25	Furniture and fixtures; manufacturing	Y	Y	Y	A _S	X3	Y.4	И		
26	Paper and allied products; manufacturing	Y	Y	Y	Y ²	У3	Y4	N		
27	Printing, publishing, and allied industries	Y	Y	Y	Y2	Х3	Υ4	N		
28	Chemicals and allied products; manufacturing	Y	Y	Y	Y2	Уз	Y4	И		
29	Petroleum refining and related industries	Y	Y	Y	Y2	У3	Y4	N		

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

	SUGGESTED LAND US			Land Use					
	Land Use	1	e Zone	Noise Z			Noise Zone 3 (DNL or CNEL)		
		(DNL 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	Y2	Х3	Υ4	N	
32	Stone, clay and glass products; manufacturing	Y	Y	Y	Y2	Л3	Y4	N	
33	Primary metal products; manufacturing	Y	Y	Y	Y2	А3	Y4	N	
34	Fabricated metal products; manufacturing	Y	Y	Y	Y2	Х3	Υ4	N	
35	Professional scientific, and controlling instruments; photographic and optical goods; watches and clocks	Y	У	Y	25	30	N	И	
39	Miscellaneous manufacturing	Y	Y	Y	Y2	Ā3	Y4	N	
	Transportation, Communication		lities						
41	Railroad, rapid rail transit, and street railway transportation	Y	Y	Y	Y2	Х3	Y4	N	
42	Motor vehicle transportation	Y	Y	Y	As	Д3	Y4	N	
43	Aircraft transportation	Y	Y	Y	Y2	Y3	Y4	N	
44	Marine craft transportation	Y	Y	Y	A ₅	Х3	Y4	N	
45	Highway and street right-of- way	Y	Y	Y	Y2	Д3	Y4	N	
46	Automobile parking	Y	Y	Y	Y2	X3	Y4	N	
47	Communication	Y	Y	Y	255	305	N	N	
48	Utilities	Y	Y	Y	Y2	Y3	Y4	N	
49	Other transportation, communication and utilities	Y	Y	Y	255	305	N	И	
50	Trade		•						
51	Wholesale trade	Y	Y	Y	Y2	Д3	Y4	N	
52	Retail trade - building materials, hardware and farm equipment	Y	Y	Y	У2	Ā3	Y4	И	
53	Retail trade - shopping centers	Y	Y	Y	25	30	И	И	
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	И	N	
56	Retail trade - apparel and accessories	Y	Y	Y	25	30	N	И	

	Land Use	Sugg	ested La	nd Use Co	ompatibil	Lity		
		Nois	e Zone 1	Noise Z	one 2	Noise Zo	one 3	
		(DNL	or CNEL)	(DNL or	CNEL)	(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	И	И
58	Retail trade - eating and drinking establishments	Y	Y	Y	25	30	N	И
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	И	И
62	Personal services	Y	Y	Y	25	30	N	N
62.4	Cemeteries	Y	Y	Y	Y2	X3	Y4,11	Y6,11
63	Business services	Y	Y	Y	25	30	N	N
63.7	Warehousing and storage	Y	Y	Y	Y2	Х3	Υª	И
64	Repair Services	Y	Y	Y	A _S	. A3	Y4	И
65	Professional services	Y	Y	Y	25	30	N	N
55.1	Hospitals, other medical fac.	Y	Y1	25	30	N	И	И
65.16	Nursing Homes	Y	Y	N1	N1	N	N	N
56	Contract construction services	Y	Y	Y	25	30	N	N
67	Government Services	Y	Y1	Y1	25	30	N	N
68	Educational services	Y	Y1	25	30	N	N	И
59	Miscellaneous	Y	Y	Y	25	30	N	N
70	Cultural, entertain	nment .	and recrea	tional		•		
71	Cultural activities (Y	Y1	25	30	И	И	И
71.2	churches) Nature exhibits	Y	Y1	Y1	N	N	N	N
72	Public assembly	Y	Y1	Y	N	N	N	N
72.1	Auditoriums, concert	Y	Y	25	30	N	N	N
72.11	Outdoor music shells, amphitheaters	Y	Υ1	N	N	N	N	N
72.2	Outdoor sports arenas, spectator sports	Y	Y	Y1	Y7	И	N	N
73	Amusements	Y	Y	Y	Y	N	N	N
74	Recreational activities (include golf courses, riding stables, water rec. 1	Y	Y1	Y1	25	30	И	И
75	Resorts and group camps	Y	Υ1	Y1	Y	И	N	И
76	Parks	Y	Y1	Y1	Y	N	N	N
79	Other cultural, entertainment and recreation	Y	Υ1	Y1	Y	N	И	И
80	Resource Production	n and i	Extraction		1	<u>'</u>	-	
81	Agriculture (except	Y	Y	У8	X ₀	Y10	Y10,11	Y10,11

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

	Land Use	Suggested Land Use Compatibility							
			Zone 1 r CNEL)	Noise Z		Noise Zo			
SLUCM NO	LAND USE NAME	< 55	55- 64	65- 69	70 -74	75-79	80-84	85+	
81.5	Livestock farming	Y	Y	Ā8	Y9	N	И	N	
81. 7	Animal breeding	Y	Y	Х8	Y9	N	N	N	
82	Agriculture related activities	Y	Y	Х8	Хa	Y10	Y10,11	Y10,11	
83	Forestry Activities	Y	Y	Х8	X ₀	Y10	Y10,11	Y10,11	
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
Y (Yes)	Transportation 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	NLR (outdoor to indoor) to be achieved through incorporation of noise attenuation into the design
Reduction) 25,30, or 35	and construction of the structure. 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 <u>ZONES</u>

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.

JOINING FORCES

Regional Joint Land Use Study

Table 3

RIS Land Use Code	Category	Examples of Uses	OPNAV Land Use Code	OPNAV Land Use	Comments
(COG_LU)	category	Examples of Oses	(SLUCM NO)	Description	comments
111	Single family	Single family detached units and duplexes	11.11	Single units, detached	
112	Multi-family	Apartments, condominiums, residential hotels,	11.31	Apartments: walk-up	
		converted apartments and townhouses (single			
		family attached)			
113	Mobile home	Mobile homes inside mobile home parks and free-	14	Mobile home parks or	
		standing units outside parks		courts	
114	Group quarters	Nursing homes, group homes, college dormitories,	12	Group quarters	
		jails, military base personnel quarters			
120	Commercial	Unspecified office or retail uses or a combination	59	Other retail trade	
		of office and retail uses, excludes office and retail			
		uses when residential use is present (see mixed			
		use)			
121	Office	Generally includes any administration functions	69	Miscellaneous (Services)	
		include corporate and government offices, banks*			
122	Retail	Retail trade and services, such as department	59	Other retail trade	
		stores, repair shops, supermarkets, restaurants*			
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/	Churches, governmental facilities and offices,	67	Government Services	This RIS land use category is broad and matches to several OPNAV
	semi-public	museums, hospitals, medical clinics, libraries and			categories. Government Services represents the broadest section of these
		military bases			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	39	Miscellaneous	
		showrooms*		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	48	Utilities	
		easements, pump stations, water treatment plants			
		and water systems			
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	41	Railroad, rapid rail	OPNAV makes no distinction between passenger and freight rail.
		facilities, freight only		transit, and street	
				railway transportation	
149	Communication	Radio and television communications stations	47	Communication	
151	Transit	Passenger rail and bus lines and facilities	41	Railroad, rapid rail	OPNAV makes no distinction between passenger and freight rail.
				transit, and street	
				railway transportation	
160	Mixed use	Areas that contain both commercial (office and	16	Other residential	OPNAV has no classification for mixed use development. Matching this
		retail) and residential uses either in the same			category to a general residential category due to the presumed presence
		facility or in very close proximity			of residences in these areas.
170	Parks/	Public and private parks, golf courses, public and	76	Parks	
	recreation	private tennis courts and swimming pools,			
		amusement parks			
172	Landfill	Sanitary landfills, land applications, and similar	48.5	Solid waste disposal	48.5 is present in the OPNAV CZ/APZ table but not in the Noise Zone
		waste management facilities		(Landfills, incineration,	table. Assumed to be equivalent to 48 (Utilities).
				etc.)	
173	Under	Land that has undergone site preparation and	91	Undeveloped Land	OPNAV does not have an equivalent classification, but undeveloped land
	construction	construction has begun			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	Land that is mostly undeveloped, yet includes a	11.11	Single units: detached	Single units: detached is the lowest density residential land use
	acreage	residence, either house or mobile home, as a			classification in OPNAV and is therefore the best match for this extremely
		minor part of the use			low density residential classification.
303	Ranch land	Land that is either devoted or suited to raising of	81.5	Livestock farming	
		livestock			
304	Timberland	Land that is wooded or forested	83	Forestry Activities	
305	Farmland	Land that is either devoted to or suited to	81	Agriculture (except live	
		cultivation of crops		stock)	
309	Improved	Open land that has a non-residential structure	91	Undeveloped Land	OPNAV has no equivalent to this. The low level of development described
	acreage				by this classification means that Undeveloped Land fits best.
401	Parking	Paved areas dedicated to vehicle parking, includes	46	Automobile parking	
		parking structures			
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	Water bodies less than 10 acres	93	Water Areas	OPNAV does not split its water classification by size.
	bodies				

Figure 9

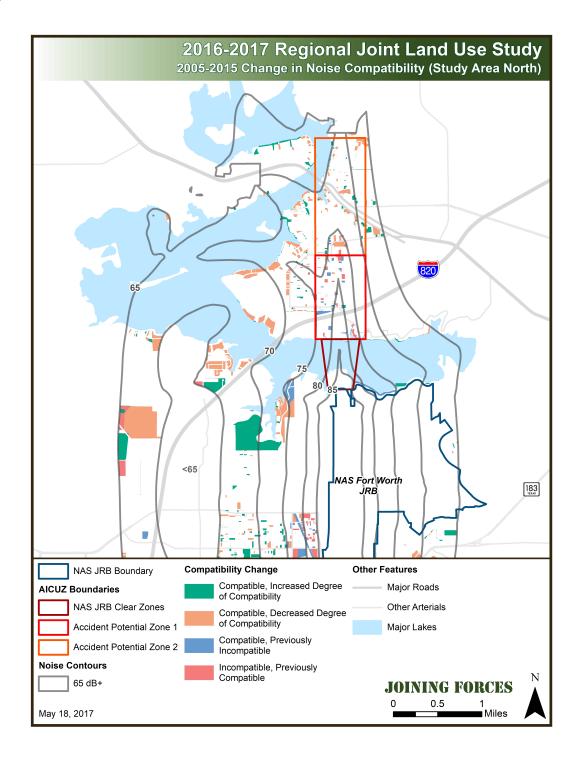


Figure 10

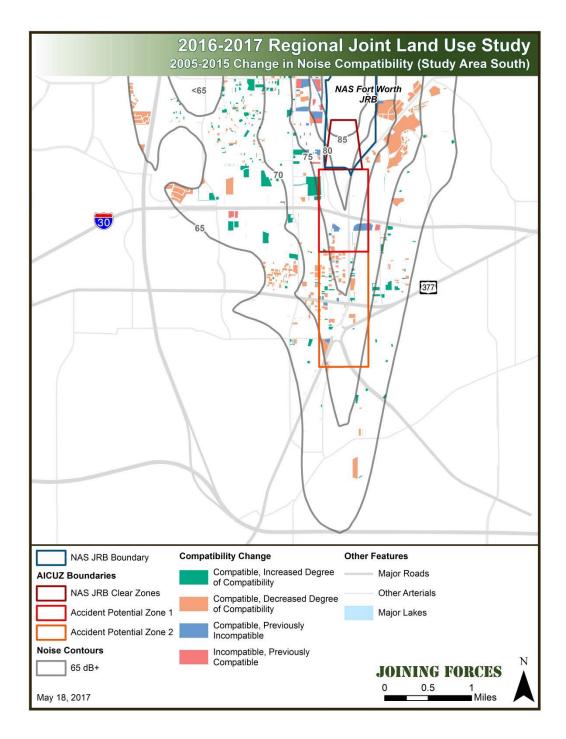


Table 4

	ATD INCO	ALLATION COME	מאחדם דם זופט פו	ONES	
	SUGGESTED LAND USE C				IES1
SLUCM		CLEAR ZONE Recommendati	APZ-I Recommendati		Density
NO.	LAND USE NAME RESIDENTIAL	on	on	on	Recommendation
11	Household Units				Max density of
11.11	Single units: detached	N	N	Y2	1-2 Du/Ac
11.12	Single units: semidetached	N	N	N	
11.13	Single units: attached row	N	N	N	
11.21		N	N	N	
11.21	Two units: side-by-side Two units: one above	N	IN	IN	
11.22	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	
	Mobile home parks or				
14	courts	N	N	N	
15	Transient lodgings	N	N	N	
16	Other residential	N	N	N	
20					
0.1	Food & kindred	,,	,,	112	Max FAR 0.56
21	products; manufacturing Textile mill products;	N	N	Υ2	in APZ II
22		N	N	Y2	same as above
	Apparel and other				
	finished products;				
	products made from				
23	fabrics, leather and similar materials	N	N	N	
23	Lumber and wood	14	14	TA.	Max FAR of
	products (except				0.28 in APZ I
	furniture);				& 0.56 in APZ
24	manufacturing	N	Y	Y2	II
25	Furniture and fixtures; manufacturing	N	Y	Y2	same as above
23	Paper and allied	14			Danie as above
26	products; manufacturing	N	Y	Y2	same as above
0.7	Printing, publishing,	24	.,,	1/2	
27	and allied industries Chemicals and allied	N	Y	Y2	same as above
28	products; manufacturing	N	N	N	
	Petroleum refining and				
29	related industries	N	N	N	
30	MANUFACTURING ³ (continued	1)			

	SUGGESTED LA		COMPATIBLE USE 2		
SLUCM		CLEAR ZONE	APZ-I	APZ-II	Density
NO.	LAND USE NAME	Recommendation	Recommendation	Recommendation	Recommendation
	Rubber and misc. plastic products;				
31	manufacturing	N	N	N	
	Stone, clay and				
	glass products;				Max FAR 0.56 in
32	2	N	N	Y	APZ II
	Primary metal				
33	products; manufacturing	N	N	Y	Same as above
- 00	Fabricated metal				Danie ab above
	products;				
34	manufacturing	N	N	Y	Same as above
	Professional scientific & controlling				
	instrument;				
	photographic and				
35	optical goods; watches and clocks	N	N	N	
33	and clocks	14	IN .	14	Max FAR of 0.28
	Miscellaneous				in APZ I & 0.56
39	manufacturing	N	Y	Y	in APZ II
40		nication and util	lities 4,5		
	Railroad, rapid rail				
	transit, and street railway				
41	transportation	N	Y5	Y	Same as above
	Motor vehicle				
42	transportation	N	γ5	Y	Same as above
12		11		1	Danie as above
43	Aircraft transportation	N	Y5	Y	Same as above
43	· ·	14	1-	1	Sallie as above
0.0	Marine craft		Y5	l .,	
44	transportation Highway and street	N	13	Y	Same as above
45	right-of-way	И	Y5	Y	Same as above
			Y5		
46	Auto parking	N		Y	Same as above
47	Communication	N	Y ⁵	Y	Same as above
48	Utilities	N	Y5	Y	Same as above
	Solid waste disposal				
	(Landfills,				
48.5	incineration, etc.)	N	N	N	
	Other transport,				See Note 6
49	comm. and utilities	N	Y ⁵	Y	below
50	Trade				
					Max FAR of 0.28 in APZ I & 0.56
51	Wholesale trade	N	Y	Y	in APZ II
	Retail trade -				
	building materials,				0
52	hardware and farm	N	Y	Y	See Note 6 below
52	equipment Retail trade - Shopping	14	1	1	DETOM
	centers, Home				
	Improvement Store,				Max FAR of 0.16
53	Discount Club, Electronics Superstore	N	N	Y	in APZ II
- 55	Tigotionics Superstole	**	-	_	Max FAR of 0.24
54	Retail trade - food	N	N	Y	in APZ II

			COMPATIBLE USE 2 LITY IN ACCIDENT		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
56	Retail trade - apparel and accessories	N	N	Y	Max FAR 0.28 in APZ
50	Retail trade - furniture, home, furnishings and	N	IN IN	1	11
57	equipment Retail trade - eating and	N	N	Y	Same as above
58	drinking establishments	N	N	N	Max FAR of 0.16 in
59 60	Other retail trade Services	N	N	Y	APZ II
	5-27-2-0-5				Max FAR of 0.22 for
61	Finance, insurance and real estate services	N	И	Y	"General Office/Office park" in APZ II
62	Personal services	И	N	Y	Office uses only. Max FAR of 0.22 in APZ II
62.4		N	Y9	Y9	
63	Business services(credit reporting; mail, stenographic, reproduction; advertising)	И	N	Y	Max FAR of 0.22 in
03		N	IN	1	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	И	Y	Max FAR of 0.22 in APZ II
65.1		N	N	N	
65.1	Other medical facilities Contract construction	N	N	N	
66	services	N	Y	Y	Max FAR of 0.11 APZ I; 0.22 in APZ II Max FAR of 0.24 in
67	Government Services	N	N	Y	APZ II
68	Educational services	N	N	N	
69 70	Miscellaneous Cultural, entertainment an	N N	N	Y	Max FAR of 0.22 in APZ II
71	Cultural, entertainment an	N N	N	N	
71.2	Nature exhibits	N	γ10	γ10	
72		N	N	N	
72.1	Auditoriums, concert			N	
	Outdoor music shells,	N	N		
72.11	amphitheaters	N	N	N	

	AIR	INSTALLATION	COMPATIBLE US	E ZONES	
	SUGGESTED LAND				ZONES1
SLUCM NO.	LAND USE NAME	CLEAR ZONE Recommendation	APZ-I Recommendation	APZ-II Recommendation	Density Recommendation
	Outdoor sports arenas,				
72.2	spectator sports Amusements -	N	N	N	
	fairgrounds, miniature				
	golf, driving ranges,				
73	amusement parks, etc. Recreational activities	N	N	Y	
	(including golf				
	courses, riding				
	stables, water			2000	Max FAR of 0.11 APZ
74	recreation)	N	Y10	Y10	I; 0.22 in APZ II
75	Resorts and group camps	N	N	N	
76	Donles	M	V10	Y10	Como on 74
/ 6	Parks Other cultural,	N	110	1,10	Same as 74
	entertainment and				
79	recreation	N	Y ⁹	Y ⁹	Same as 74
80	Resource Production and I	Extraction	ı	1	1
	Agriculture (except				
81	live stock)	Y4	γ11	Y11	
		_	_	_	
81.5,	Livestock farming and				
81.7	breeding	N	Y11,12	Y11,12	
					Max FAR of 0.28 APZ
					I; 0.56 APZ II no activity which
					produces smoke,
	Agriculture related				glare, or involves
82	activities	N	Y11	Y11	explosives
83	Forestry Activities ¹³	N	Y	Y	Same as above
84	Fishing Activities14	N14	Y	Y	Same as above
0.5	W-1 31-1-1	.,	,,	.,	
85	Mining Activities Other resource	N	Y	Y	Same as above
	production or				
89	extraction	N	Y	Y	Same as above
90	Other				
91	Undeveloped Land	Y ⁴	Y	Y	
93	Water Areas	N15	N15	N15	
93	adder vreds	14	14	14	-

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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.
Y	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.
Ē	Nx - (No with exceptions)	The land use and related structures are generally incompatible. 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.

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NOTES - SUGGESTED LANDUSE 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 II, 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.

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- 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 totlots, 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 Resourcesinstructions.
- 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

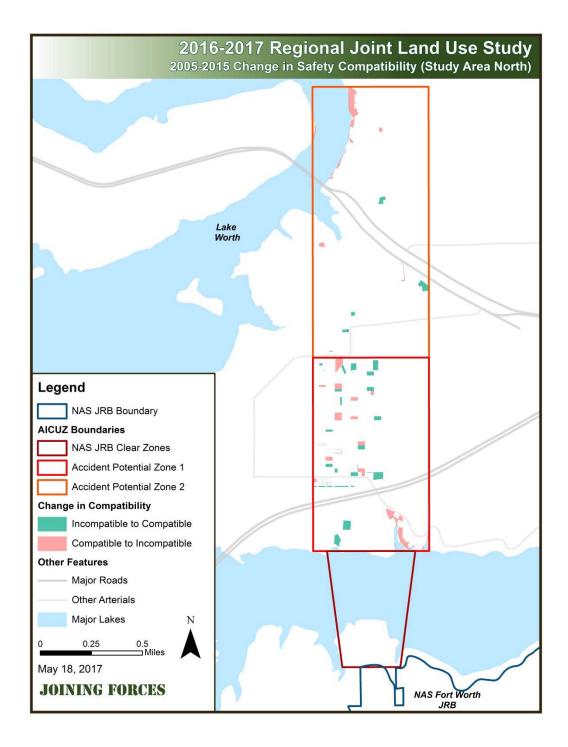
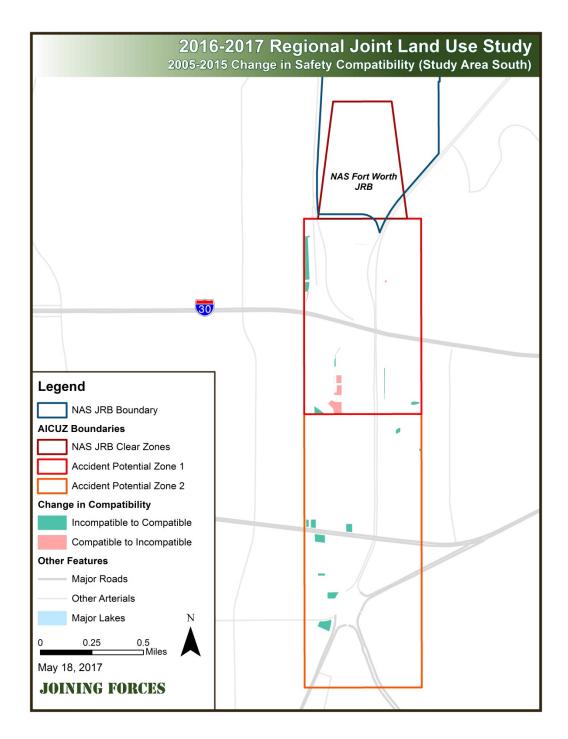


Figure 12



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

JOINING FORCES

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

Figure 13

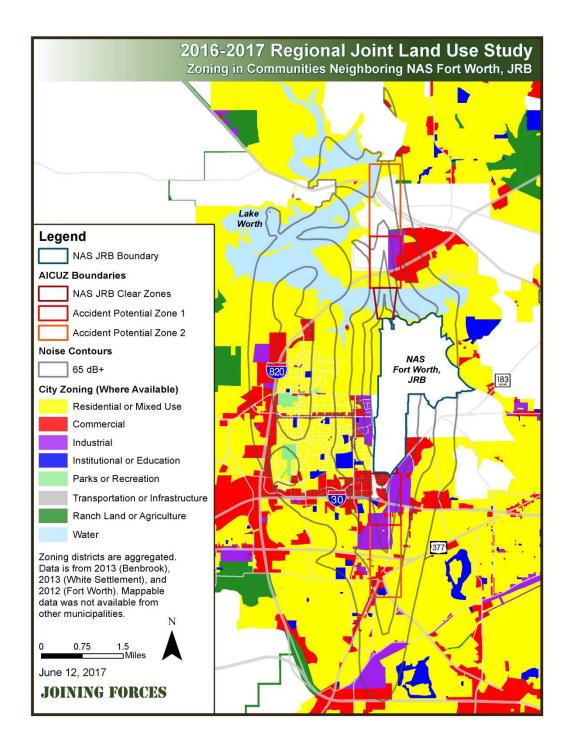


Figure 14

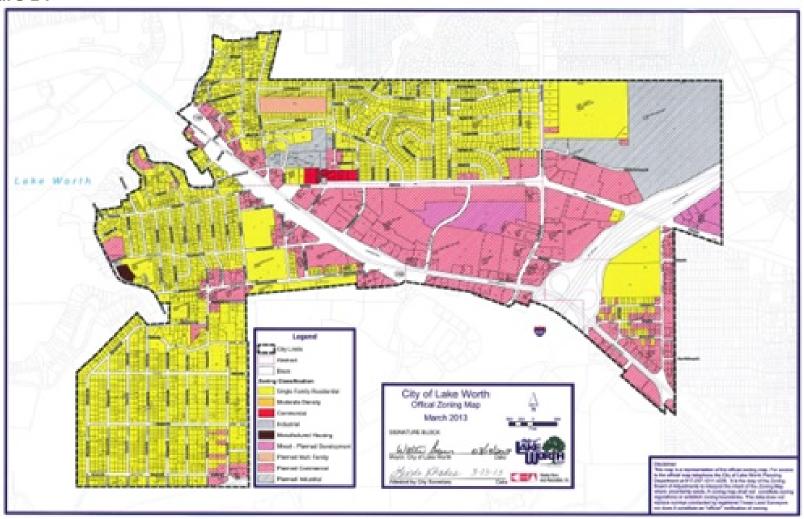


Figure 15

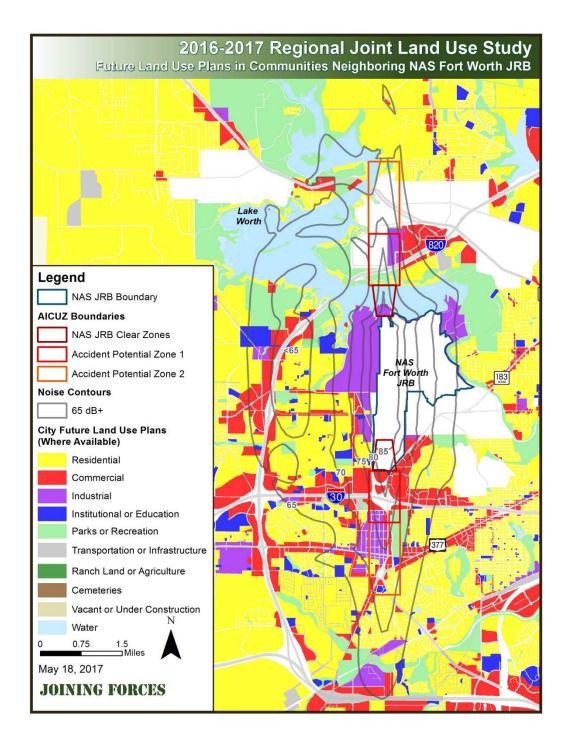
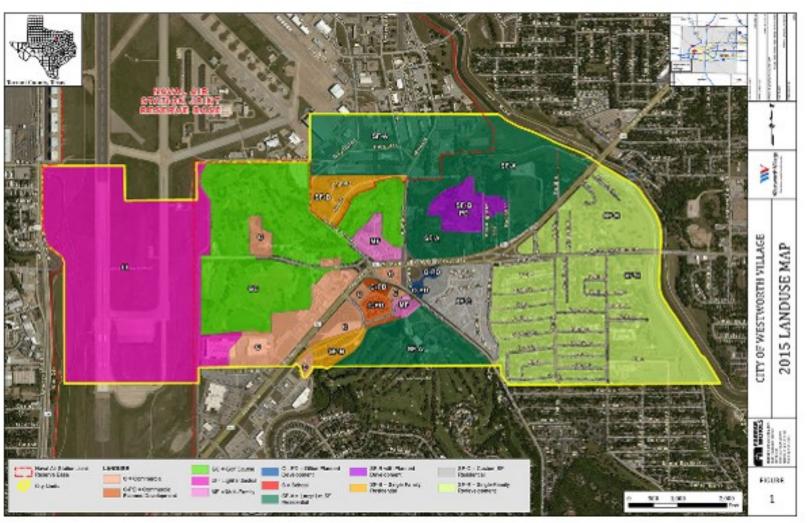


Figure 16



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 Station⁶. 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 2015⁷ 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

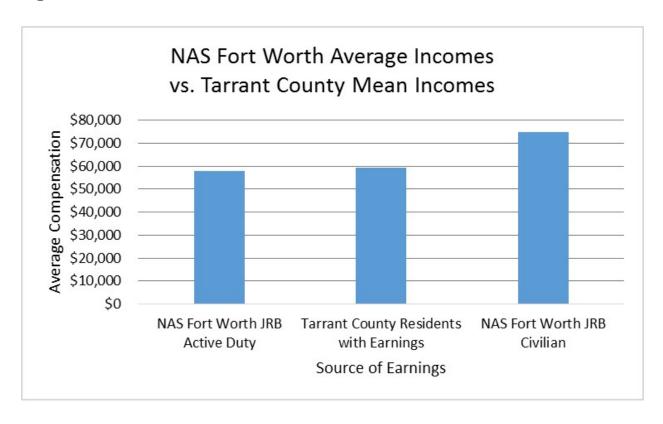
- Gross domestic product: \$4,266,811,000
- Disposable personal income: \$2,681,192,000

The average compensation⁸ 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 over⁹ (**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 Area¹⁰ (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 increase¹¹. 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

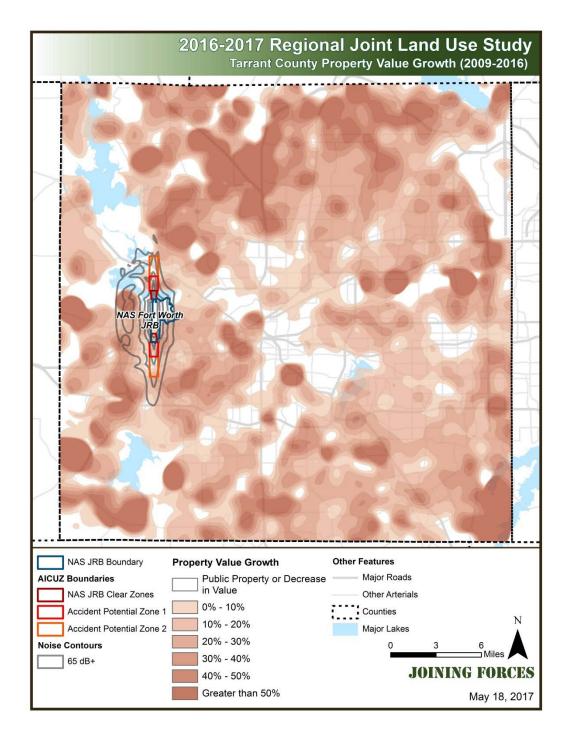


Figure 19

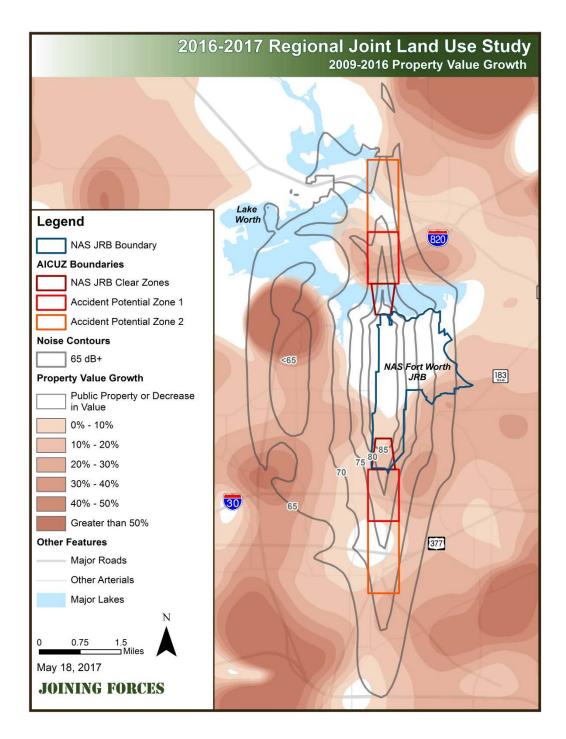


Table 5

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

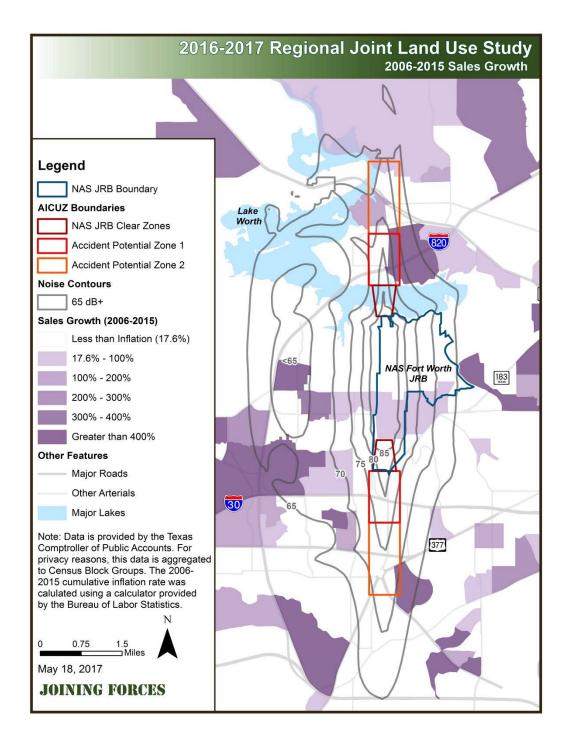


Figure 21

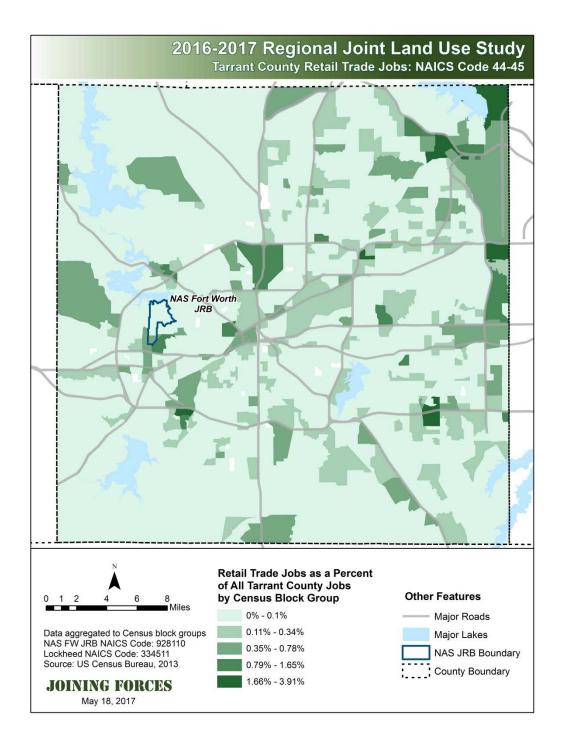


Figure 22

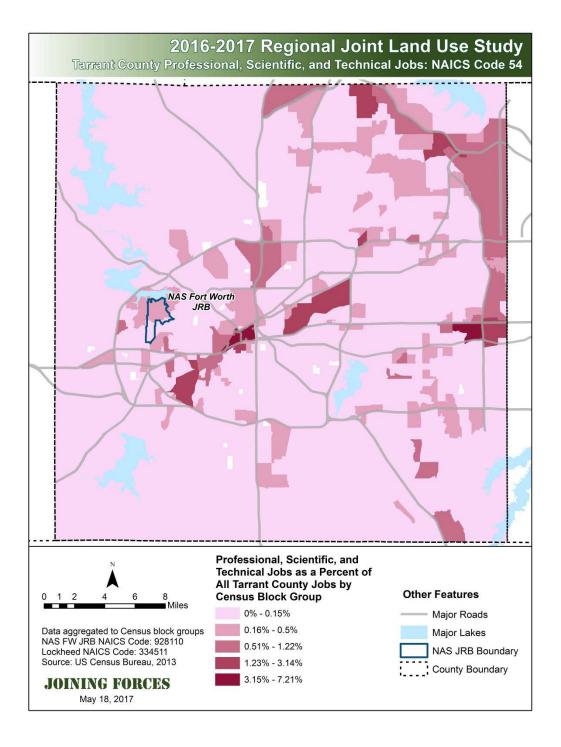


Figure 23

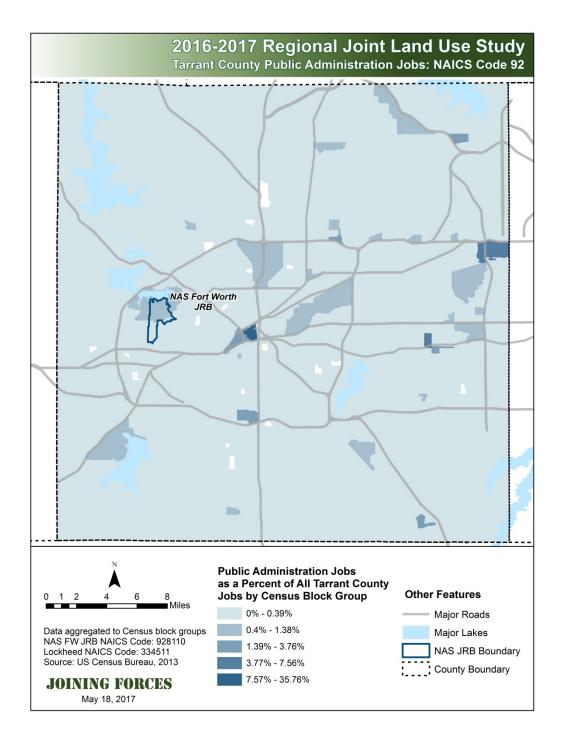


Figure 24

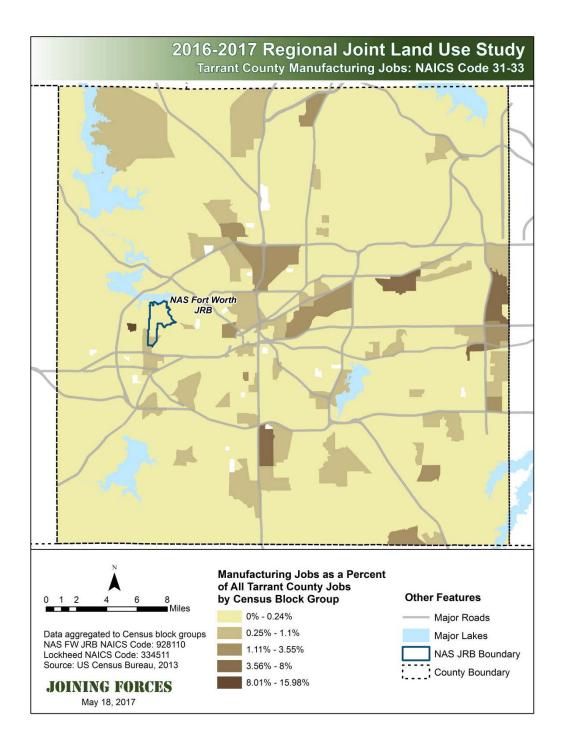
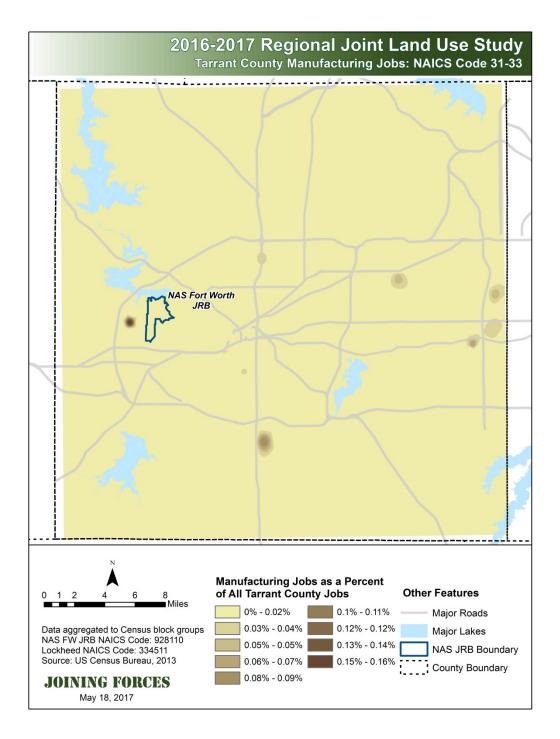


Figure 25



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

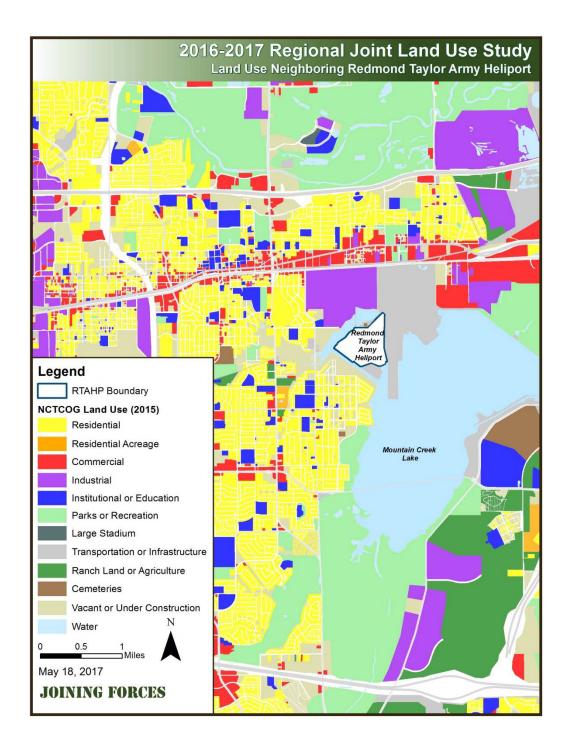


Figure 27

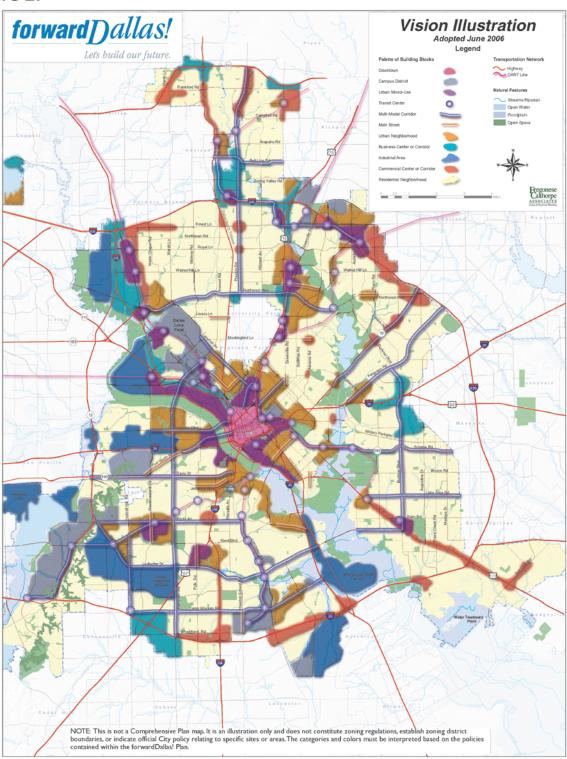


Figure 28

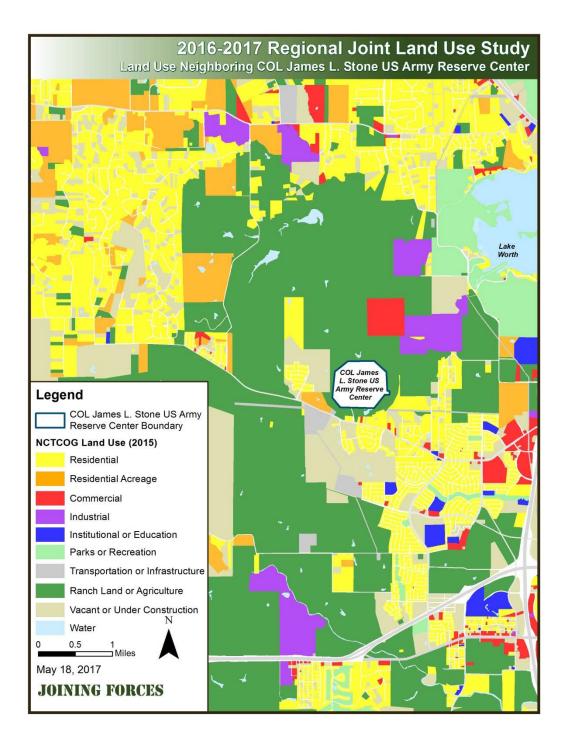


Figure 29

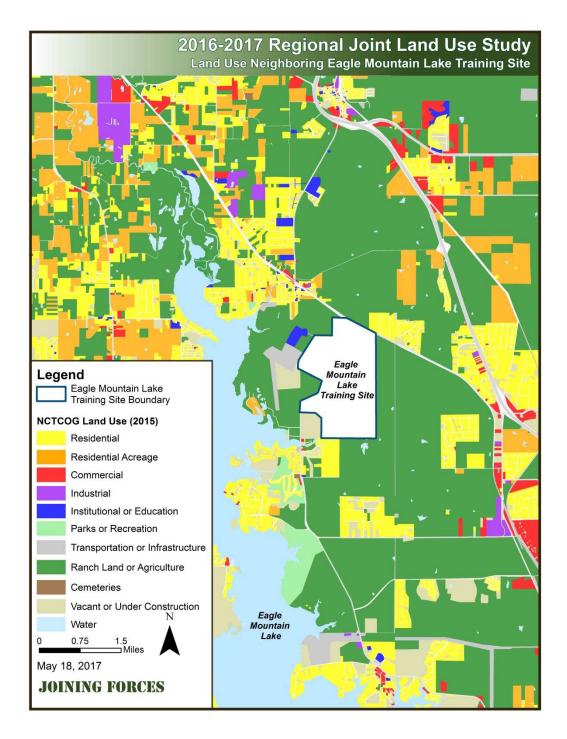


Figure 30

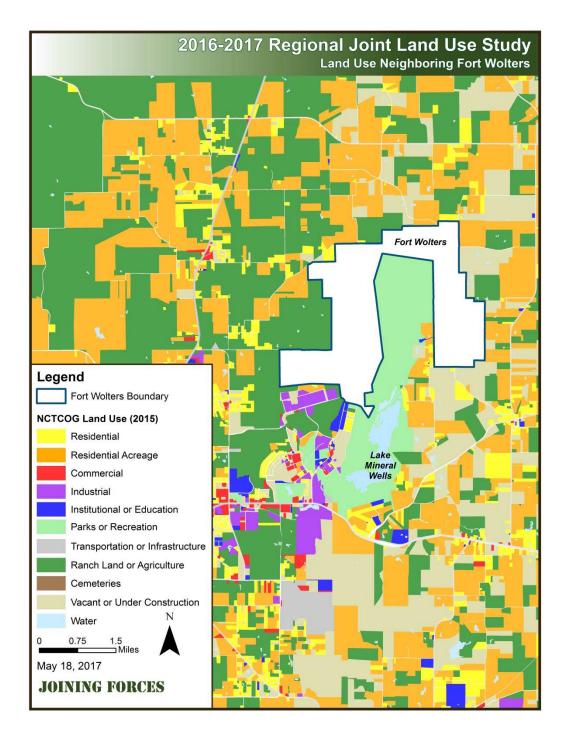
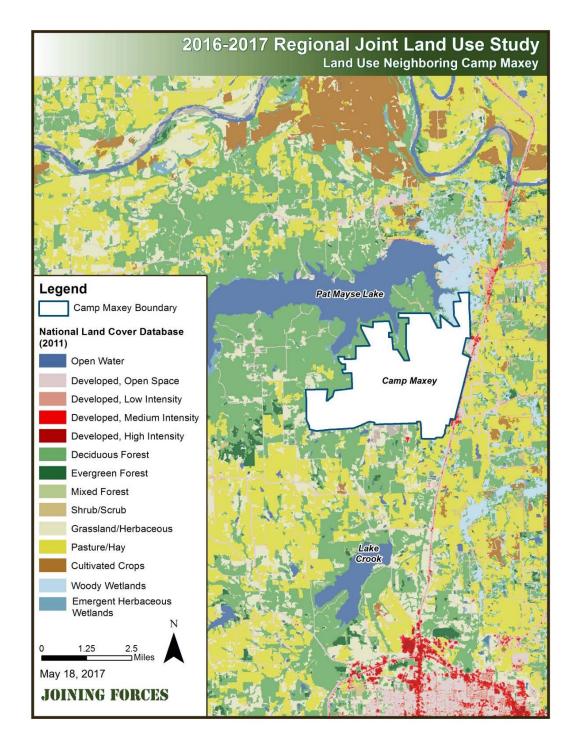


Figure 31



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

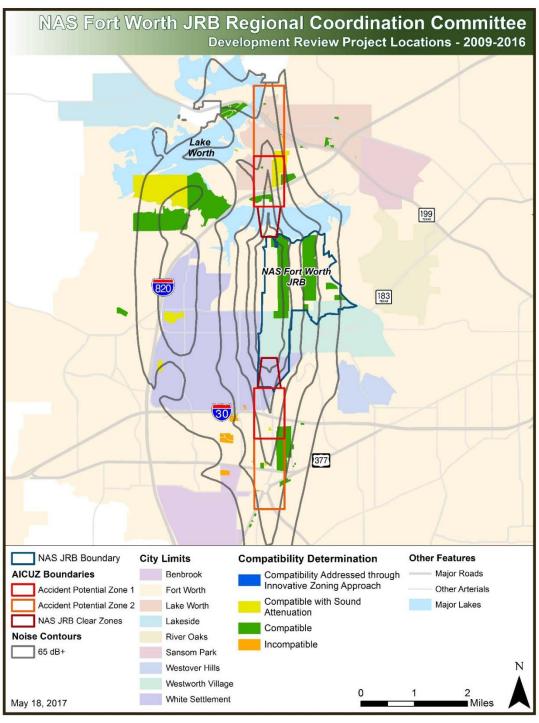


Figure 2: Projects Entered, North Study Area

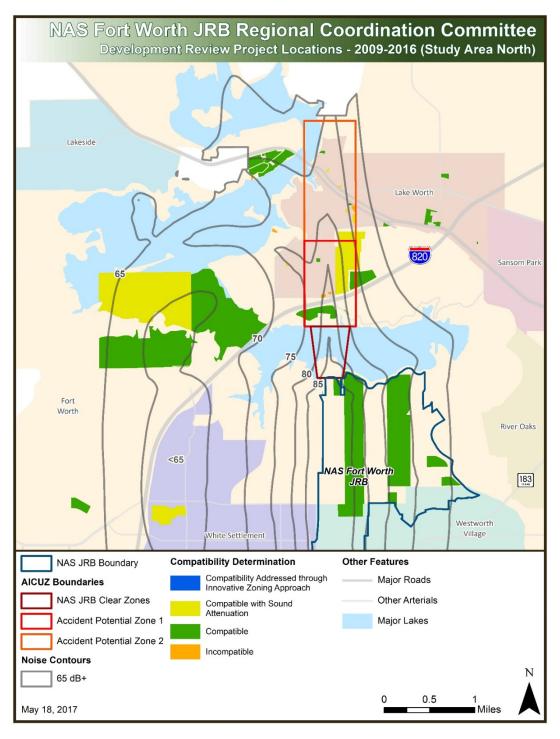
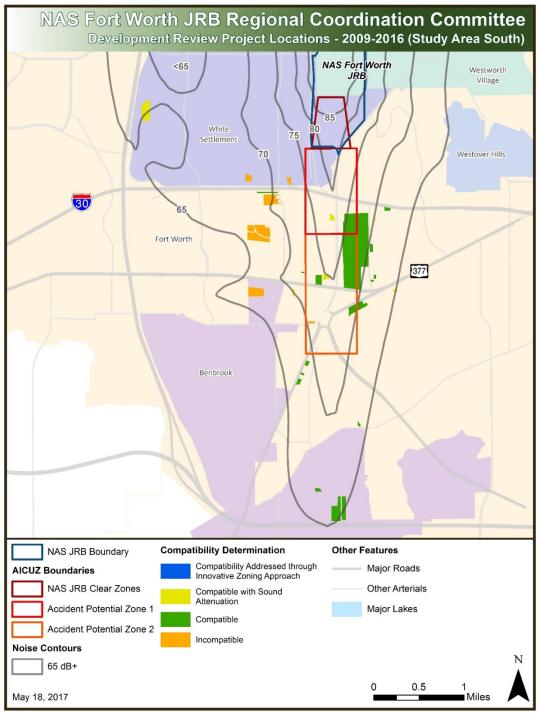


Figure 3: Projects Entered, South Study Area



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

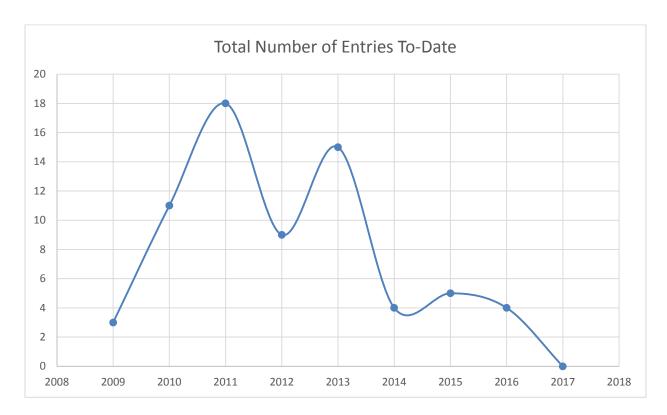


Figure 5: Total Entries from 2009-2016, by Municipality

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	Local government officials are subject to budgets,							
 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 	 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
- 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. 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.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							
Interd	connecting Entity	(IE):						
This Resou	declaration rce:	applies	to	the	following	proposed	Generation	
Check	the below listed	attestation(s	s) whic	h apply	to the Generat	ion Resource.		
I herel	by attest that:							
_	This IE has notificated proposed of and/or Formal Re	Generation R	esourc	e and re-	quested that it	perform an Int		
	This IE has com Department of Administration ((2013); or	Defense	(DOD)	Siting	Clearinghou	se and Fed	eral Aviation	
_	The above listed review from the (FAA), as descri	Department	of Defe	ense (DC	D) and the Fed	leral Aviation.	Administration	
to bine	gning below, I cert d the IE listed abo h IE listed above, se and correct.	ve, that I am	author	ized to e	xecute and sub	mit this declar	ation on behalf	
Signat	ure			_				
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=TIT19

ZO 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/143595fa3be 36 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%20Sc a 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 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

US Navy

Sheila Donovan Community Plans and Liaison Coordinator US Navy 1220 Pacific Highway San Diego, CA 92132-5190 Sheila Donovan@navy.mil

Fort Hunter-Liggett Mr. Peter Rubin, Director

Public Works Combat Support Training Center Parks RFTA, Dublin, CA 94568

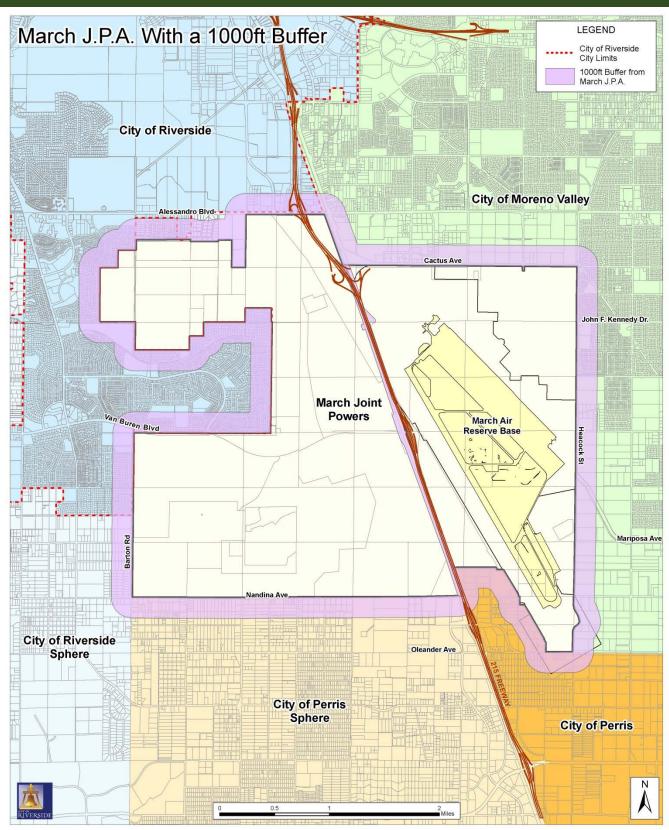
peter.rubin@usar.army.mil

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

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.



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**.

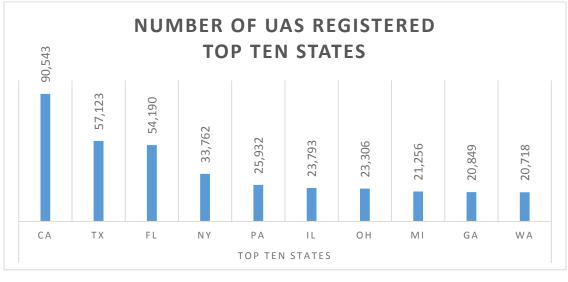


Figure 1 - Number of UAS Registered (Top Ten States)

Source: Federal Aviation Administration - "Geographic (City, State, Zip) Listing of sUAS Registry Enrollments and Registrants (as of 2/3/2017)

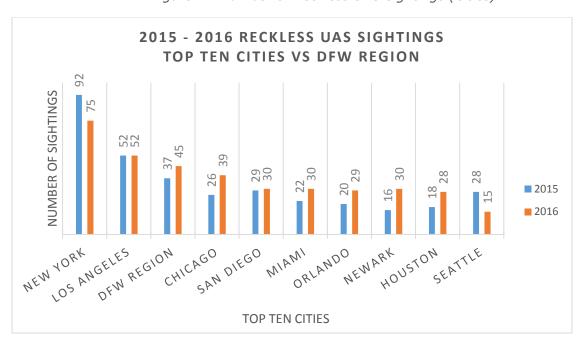


Figure 2 - Number of Reckless UAS Sightings (Cities)

Source: Federal Aviation Administration - UAS Sightings Reports November 2014 - September 2016

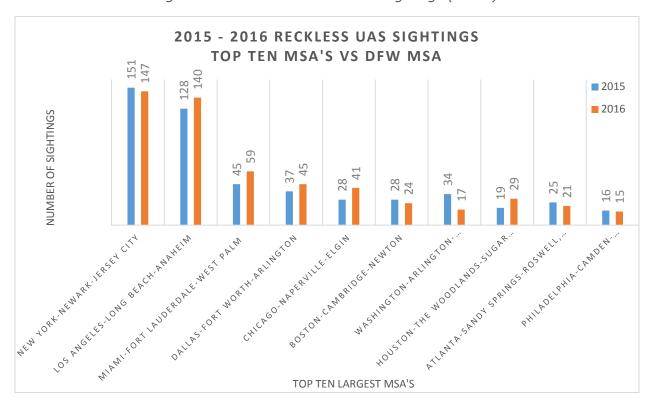


Figure 3- Number of Reckless UAS Sightings (MSA's)

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_2
5_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.

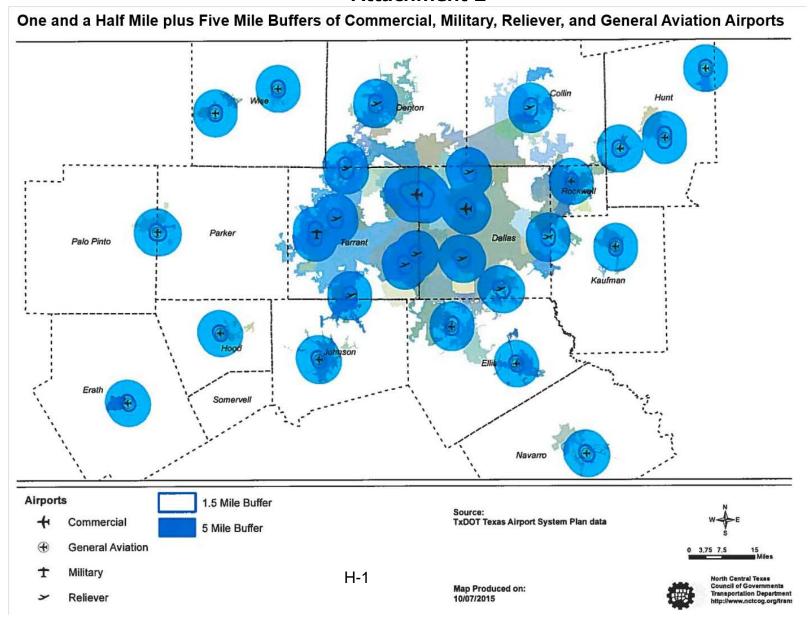
February 4, 2016 third UAS Subcommittee meeting to discuss draft ordinance and possible technology to detect UAS.

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



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
			Farmers Branch	x	х		
			Carrollton	x	x		
	1		Richardson		x		
Addison	ADS	Reliever	The Colony		×		
Addison	AUS	Reliever	Dallas	x	×		×
	1		Plano		x		
	ļ		Addison	×	×	×	×
	1		Hebron		×		
			Grand Prairie	Marie S.	x		x
			Dalworthington Gardens		x		
Arlington Municipal	GKY	Reliever	Arlington	x	x	x	x
			Mansfield	130	×	Mark States	I STANSON WAR
			Pantego	(F) 20 5 W	x		AUR CHANG
			Runaway Bay	×	×		
Bridgeport Municipal	XBP	General Aviation	Bridgeport	x	×	×	x
			Lake Bridgeport	×	×		r
	BASSINE.	1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 -	Corsicana	x	x	x	×
			Eureka		x		
			Angus	x	x		
C David Campbell Field-	CRS	General Aviation	Retreat	A SALES OF THE SAL	x		
Corsicana Municipal			Navarro	x	x		Total Control
			Mildred	^	x		
			Mustang	x	x		
Station Court & Bulliances & Station Control Sec	ERCOTACHES	REMAZES PROGRAMMENT	Josephine	A light from the contract			100000000000000000000000000000000000000
Caddo Mills Municipal	7F3	General Aviation			x		
cado wiiis waiicipai	''`	General Aviation	Caddo Mills		-	x	
Clark Field Municipal	SEP	General Aviation	Stephenville	x	x	N. SERVICE SERVICES	×
Clark Fleta Wallicipal	-	General Aviation	Cleburne				
Cleburne Municipal	CPT	General Aviation	Keene	×	x	×	×
The second second second	DECEMBER 1			-workers.	X	APRIL APPLICATION OF	I Suprementation
			McKinney	x	x	X	x
			Allen		X		157011418893
C-III- C			Melissa		x		104553
Collin County Regional	TKI	Reliever	Lucas		×	Raint 2 602	Tease to the State
at McKinney			Lowry Crossing	X	x		
			Princeton		x	Branch Co.	
			Fairview	x	×		
	- Editate		New Hope	X	x	Haste Layer	
Commerce Municipal	2F7	General Aviation	Commerce	x	×	x	×
			Cedar Hill		x		
			Grand Prairie		x		X
Dallas Executive			Dallas	x	x	x	x
(Redbird)	RBD	Reliever	DeSoto		x		
			Cockrell Hill		x		
			Duncanville	x	×		
			Lancaster		x	2000 220 350	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
			Farmers Branch		×		-
			Irving	x	×		
Dallas Love Field	DAL	Commercial	Dallas	x	×	x	x
			University Park	x	×		
			Highland Park	x	×		
	F Discourse		Farmers Branch		x		10 XX-10
			Carrollton		x	STATE OF STATE	Production
			Grand Prairie		x		x
			Bedford		x	Nacional Property	2000
			Irving	x	x	X	x
			Fort Worth		x		x
Dellas/Fort Marth			Arlington		x	Bit roll of all all	x
Dallas/Fort Worth International	DFW	Commercial	Lewisville		×	fall as an area	4177
international			Coppell		x	Burgers and St.	0.50253355
			Dallas		x		x
			Colleyville		x	North Water	250 200 200
			Southlake		×	CHIRDS IT SO	
			Euless	x	×	x	x
			Grapevine	x	x	x	x
			Flower Mound		x	element de la compa	NEWS COLUMN
Decatur Municipal	LUD	General Aviation	Decatur	x	х	x	x
			Denton	-	x	×	x
			Krum	SAV BANCOR	x		Marine Laws
Denton Municipal	DTO	Reliever	Argyle		x		
			Northlake		×	EAST COLUMN	
			Ponder		x		280 E 25 25 25 25
	F41		Bardwell	x	x		
Faula Manadalaa)	F41	1	Ennis		x		
Ennis Municipal	F41	General Aviation	Garrett	x	x		
	F41	1	Palmer		x	***	-
			Haslet	x	X	x	x
			Fort Worth	x	x	x	x
			Justin	SE SECTION	×	NO Allowance	100 200 10
Fort Worth Alliance	AFW	Reliever	Roanoke		x	双型超速 应。153	A
			Keller	and the second	x		
			Northlake		x		
			Westlake		x	Solver District	
***************************************			Blue Mound		×		
			Haltom City	50.00	x		
			Saginaw		x		
Fort Worth Meacham	FTW		Fort Worth		x	×	x
International	I. M	Reliever	Lake Worth		x		
			Sansom Park	$\overline{}$	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	S Miles	In City Limits	Has Airport
	Land Sec		Briaroaks		x	GALLES SERVICE	
			Crowley	x	x	TOTAL STREET	
Fort Morth Calaba	DAG	Dellerrer	Fort Worth	x	x	x	×
Fort Worth Spinks	FWS	Reliever	Burleson	x	x	EXPORT OF	0.44
			Everman	200 (4545 by h	x	SEE ALL STATE	BV 335.493
			Cross Timber	The factor was	x	PSYMETON S	
Canalassas Maratainal	CD.		Brazos Bend		×		
Granbury Municipal	GDJ	General Aviation	Granbury	×	×		
	200		Grand Prairie	x	x	x	×
Grand Prairie Municipal	GPM	Reliever	Arlington	x	x	BIXE SELECA	x
			Dallas		x		x
			Red Oak		×		N and a second
	ļ		Ferris		×		
	l		Dallas		x		×
Lancaster	LNC	Reliever	Lancaster	×	×	×	x
			Hutchins	- -	x	-	
	l		Wilmer	×	×		
Majors	GVT	General Aviation	Greenville	x	x	×	x
	нод	Reliever	Balch Springs		x		A positive contract
			Seagoville		x		_
			Forney		×	-	<u> </u>
Mesquite Metro			Mesquite	×	×	x	×
		1	Dallas		x		x
			Heath		x		<u> </u>
			Sunnyvale	х	x	·	
	E 582		Red Oak		x		
			Oak Leaf		x		
rand sur-			Glenn Heights	el 126 305	x		
Mid-Way	JWY	General Aviation	Ovilla		x	Exercise Section	
			Waxahachie	x	x		
			Midlothian	x	x	x	x
		VL General Aviation	Mineral Wells	×	x	×	×
Mineral Wells	MWL		Cool		x		
			Millsap		×		
		William A America	Benbrook	SE ENGLISH	X	The state of the state of	
			Fort Worth	x	×	x	×
			Lake Worth	x	×		
NAC Food Woodh In?	100		Sansom Park		x		
NAS Fort Worth Joint	NFW	Military	Westworth Village	x	x	×	x
Reserve Base			White Settlement	x	x	x	x
			River Oaks		x	Control of the Control	
			Lakeside		x		
			Westover Hills	x	x	2010/06-10/05	Grand State of State

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
			Mobile City	х	×		
			Rowlett		x		
		General Aviation	Fate	х	x		
			McLendon-Chisholm		х		
Rockwall Municipal F46	F46		Royse City		х		
			Rockwall	х	х	×	х
			Dallas		х		х
			Heath		×		
			Wylie		х		
		General Aviation	Terrell	X	x	X	x
Terreil Municipal	TRL		Post Oak Bend City		x		
			Oak Ridge	x	x	P. C. C. C.	

Attachment 4

ORDINANCE NO.	183912
OILDIIANIAOE 140.	

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.
- "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.
- "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 Los Angeles, at its meeting of	passed by the Council of the City of	f
	HOLLY L. WOLCOTT, City Clerk By	Deputy
Approved	E.G.	Mayor

Approved as to Form and Legality

MICHAEL N. FEUER, City Attorney

y <u>Kesla Lapur</u> NJANET KARKANEN Deputy City Attorney

Date _____SEP 1 6 2015

File No. 15-0927

m:\proprietary_occ\airport\reports\draft ordinance regulating drones (revised 08-28-15).doc

JOINING FORCES

Regional Joint Land Use Study

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.

than ca Coleman - Warner Peronica Coleman-Warner, Deputy City Clerk

Ordinance Effective Date: December 2, 2015

Council File No. 15-0927

H-19

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 public 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 \S 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 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
- 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:

- In accordance with the prescriptive requirements of Section 1214 or the default ratings of Section 1215; or
- 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 1/2" 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:
 - a door and edge seal assembly that has a laboratory sound transmission class rating of at least STC 30 dB; or
 - 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.
- 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:

- 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;

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.
- 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 roomopening cross-section. Residential bathroom vents discharging at an eave vent need only to have two ninety-degree (right angle) bends.
- 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 ½" 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
 - 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:
 - a door and edge seal assembly that has a laboratory sound transmission class rating of at least STC 35 dB; or
 - 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.
- 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.
- 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.

 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 1/4" 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
 - 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:
 - a door and edge seal assembly that has a laboratory sound transmission class rating of at least STC 40 dB; or
 - 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.
- Sliding glass doors shall have glass that has a laboratory sound transmission class rating of at least STC 40 dB;
 - 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
- 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.
- 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;
 - 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 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.
- 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 roomopening 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.

		STC when under-rated
Walls	STC	windows or
		doors are used
Exterior siding, ½" solid sheathing, 2 x 4" nominal stud 16"	39	31
o.c., fiberglass insulation, ½" interior gypsum attached directly		
to studs		
7/8" stucco, No. 15 felt building paper and 1" wire mesh, 2 x		
4" nominal stud 16" o.c., fiberglass insulation, ½" gypsum	46	37
board attached directly to stud.		
Face Brick, 1/2" air space with metal ties, 3/4" insulation board		
sheathing, 2 x 4" nominal studs 16" o.c., fiberglass building	56	45
insulation, 1/2" gypsum board attached directly to studs		
1" stucco, 8" thick hollow concrete block, 1/2" 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, 1/2" gypsum board	43	34
Exterior siding, 7/16" solid sheathing, 2 x 6" nominal stud 16"		
o.c., batt insulation, resilient channels, 1/2" 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	50	40
attached directly to studs		

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 1/4" air space	26
¼" single glazed window	30
¼" laminated glass single glazed window	34
1/4" + 1/8" double glazed window with 2" airspace	39
1/4" + 1/8" double glazed window with 4 3/4" 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
1/4" single glazed window	30
1/4" laminated glass single glazed window	34
1/4" + 1/8" double glazed window with 2" airspace	39
1/4" + 1/8" double glazed window with 4 3/4" 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:

Adopted: August 9, 2007

Effective: QUOUST 24, 200

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:
Originating Department Head:
Additional Information Contact:

Dale Fisseler (6266) Fernando Costa (8042) 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:
 - 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.
 - 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 outdoorto-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, putresciblewaste 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:

- 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.

- 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

- 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.
- 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.



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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

<u>Section 1</u>. The following definitions shall apply to terms used in these Bylaws and Operating Procedures:

- A. <u>Encroachment</u> The Department of Defense defines "encroachment" as the cumulative result of any and all outside influences that inhibit normal military training and testing.
- B. <u>Joint Land Use Study</u> 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. <u>Study Sponsor</u> 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



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- 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

<u>Section 2</u>. 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

<u>Section 3</u>. 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. <u>Membership</u> 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



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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. <u>Attendance</u> 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



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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. <u>Quorum</u> 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. <u>Elections</u> 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



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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. <u>Open Meetings</u> 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. <u>Meeting Summary</u> Summaries of the meetings shall be kept and shall be submitted to the members of the RCC for approval.
- L. <u>Staff Support</u> 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.



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M. <u>RCC Functions</u> 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

<u>Section 4</u>. 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

<u>Section 5.</u> 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

<u>Section 6</u>. 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 frequency¹ 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

		Peak Discharges					
Flooding Source	Drainage	10%	2%	1%	0.2%		
and Location	Area	Annual	Annual	Annual	Annual		
		Chance	Chance	Chance	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	3.69	4,990	6,740	7,510	9,450		
Trail	3.03	1,550	0,710	7,510	3, 130		
Approximately 460 feet upstream of Las Vegas	3.11	4,400	5,970	6,650	8,370		
Trail	3.11	1, 100	3,370	0,030	0,370		
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	0.50	1,500	2,000	2,200	2,800		
Lane	0.50	1,300	2,000	2,200	2,000		

^{*}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 coefficient² 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

			Section 205	
	Drainage		Existing Condition	
Flooding Source	Area	FEMA 100 Year	(June 2002)	Increase
and Location	Square			
	Miles (sq.	Cubic Feet per		
	mi.)	Second (cfs)	cfs	%
Farmers Branch	mi.)	Second (cfs)	cfs	%
Farmers Branch at Grant Lane	mi.) 5.14	Second (cfs) 7,100	cfs 9,530	34%
	-			

Table 3: Comparison of the existing and fully developed flows in the Section 205

			Section 205 Fully	
Flooding Source	Drainage	Section 205	Developed	
and Location	Area	Existing Condition	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, gabions³ 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	Flow (cfs)						
Area	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 predevelopment 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.

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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 regrading 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 reoccurring 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

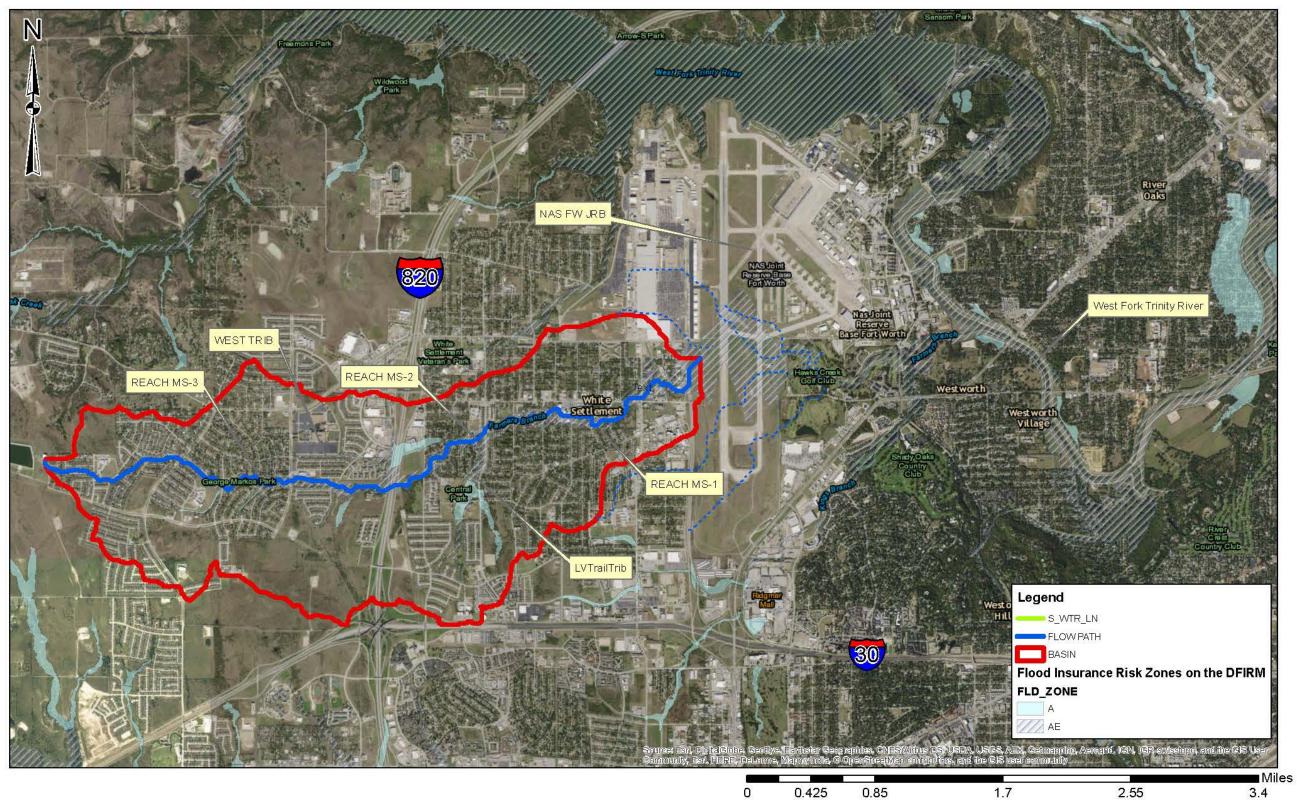
Vicinity Map



JOINING FORCES

Regional Joint Land Use Study

LOCATION MAP - FARMERS BRANCH WATERSHED



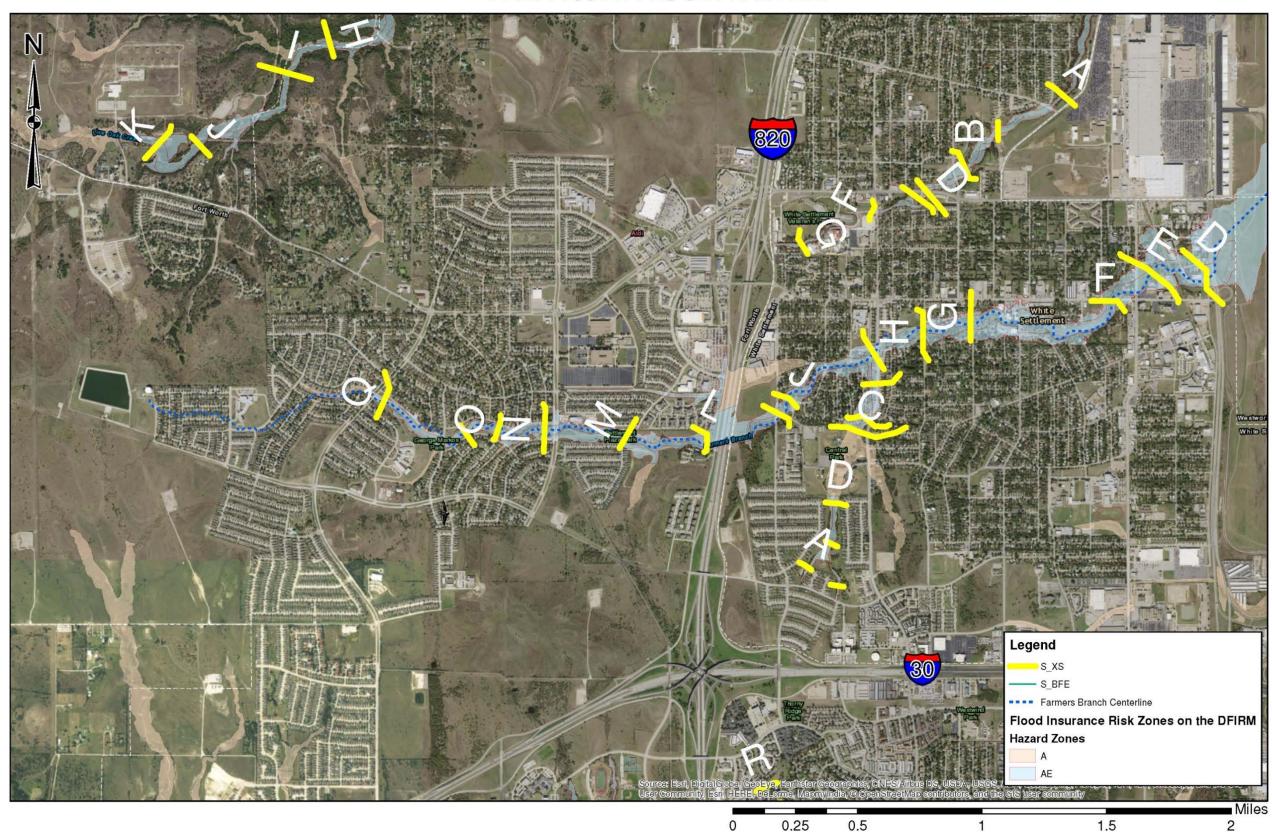
Appendix SW-B – Cost/Benefit of Options from Section 205

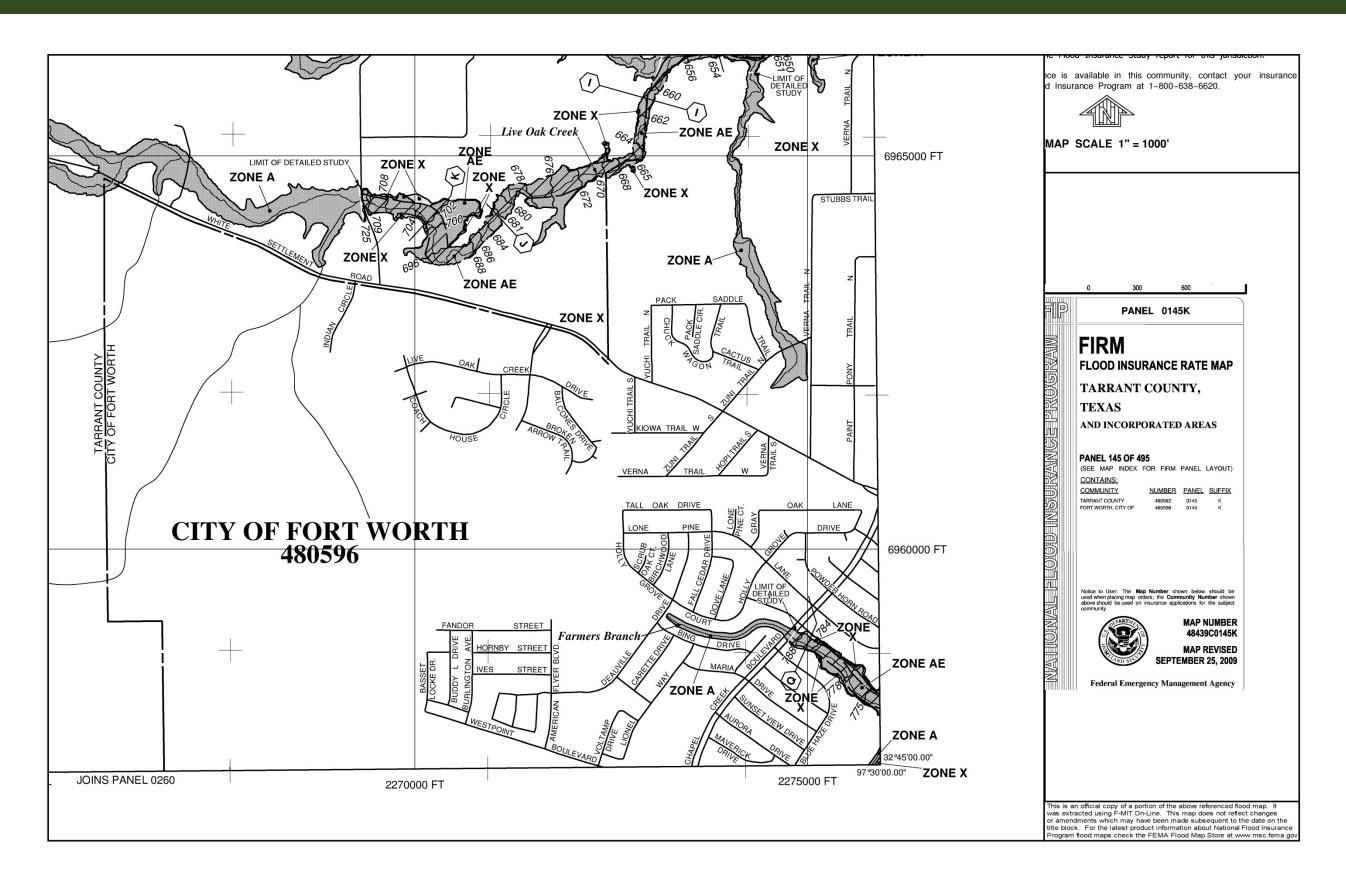
Appendix SW-C - FEMA Maps and FIS Profiles

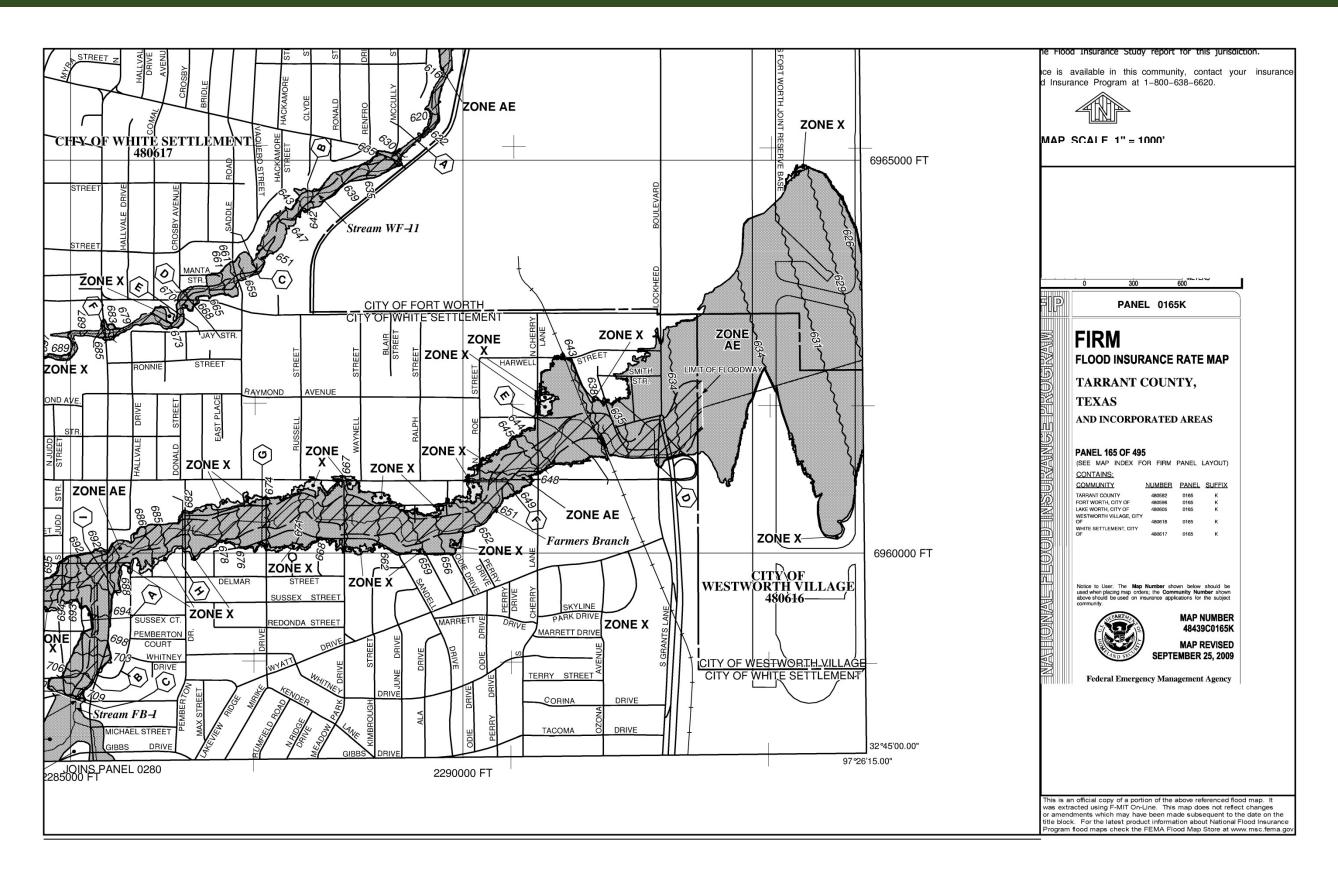
JOINING FORCES

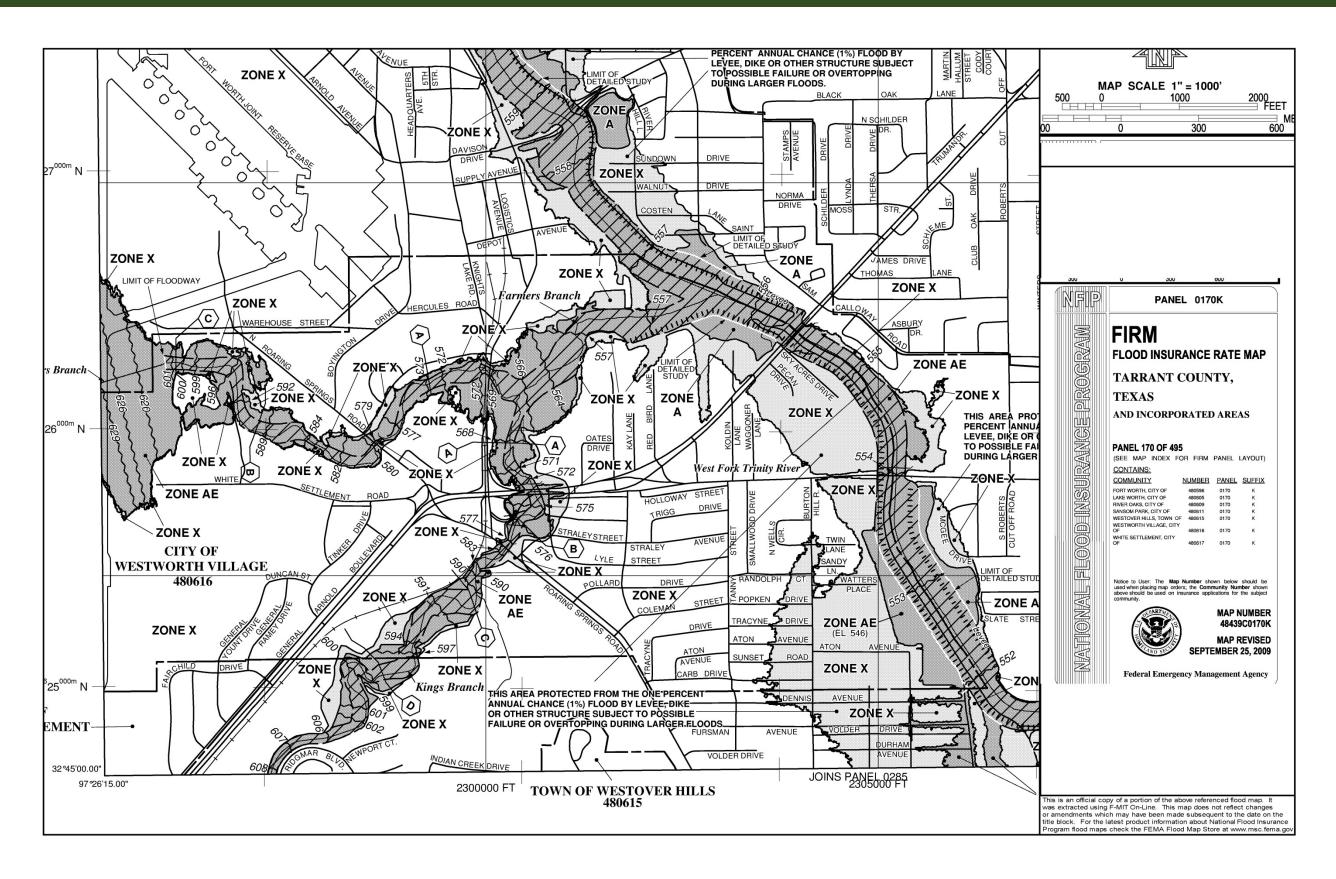
Regional Joint Land Use Study

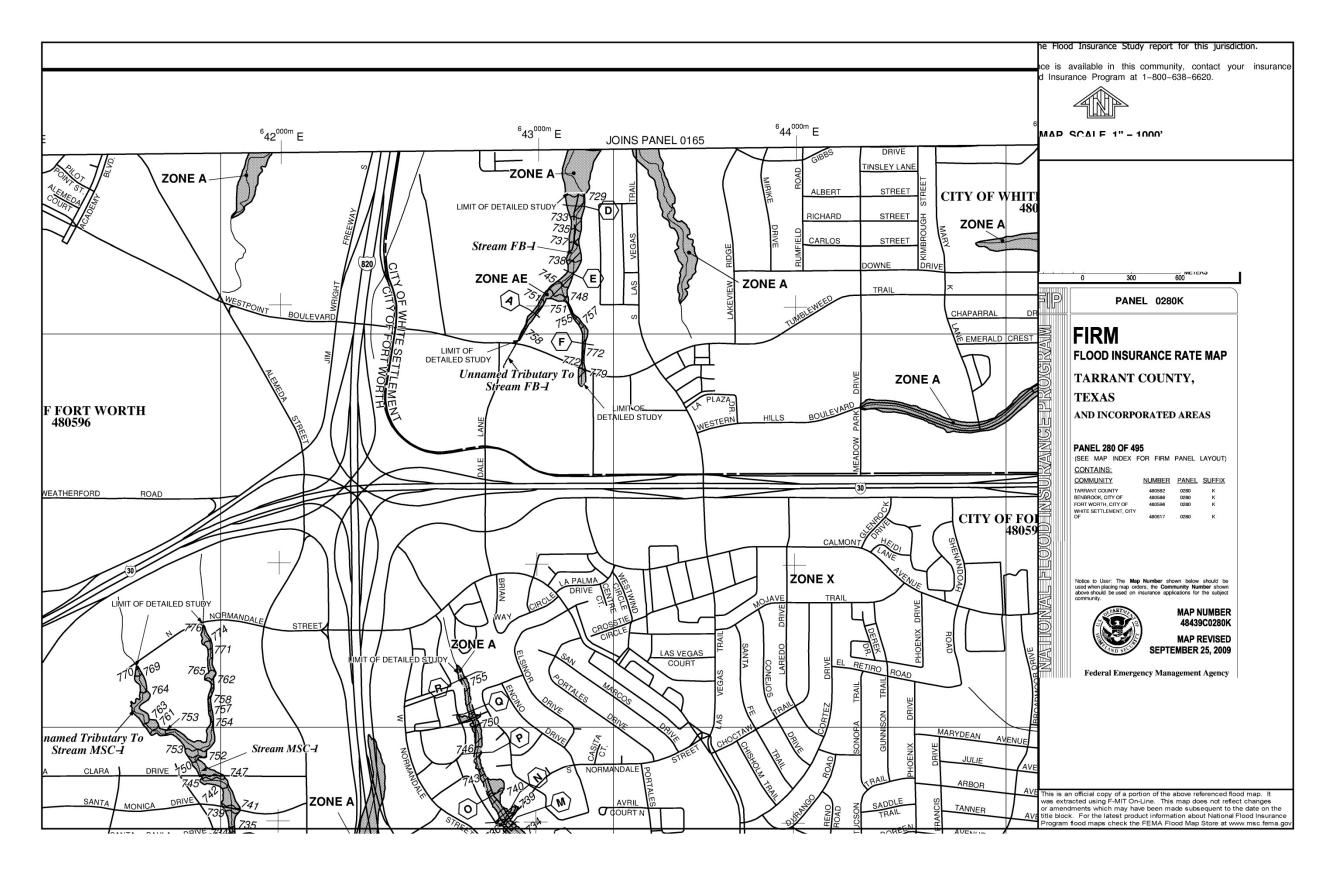
FEMA 100YR FLOODPLAIN MAP

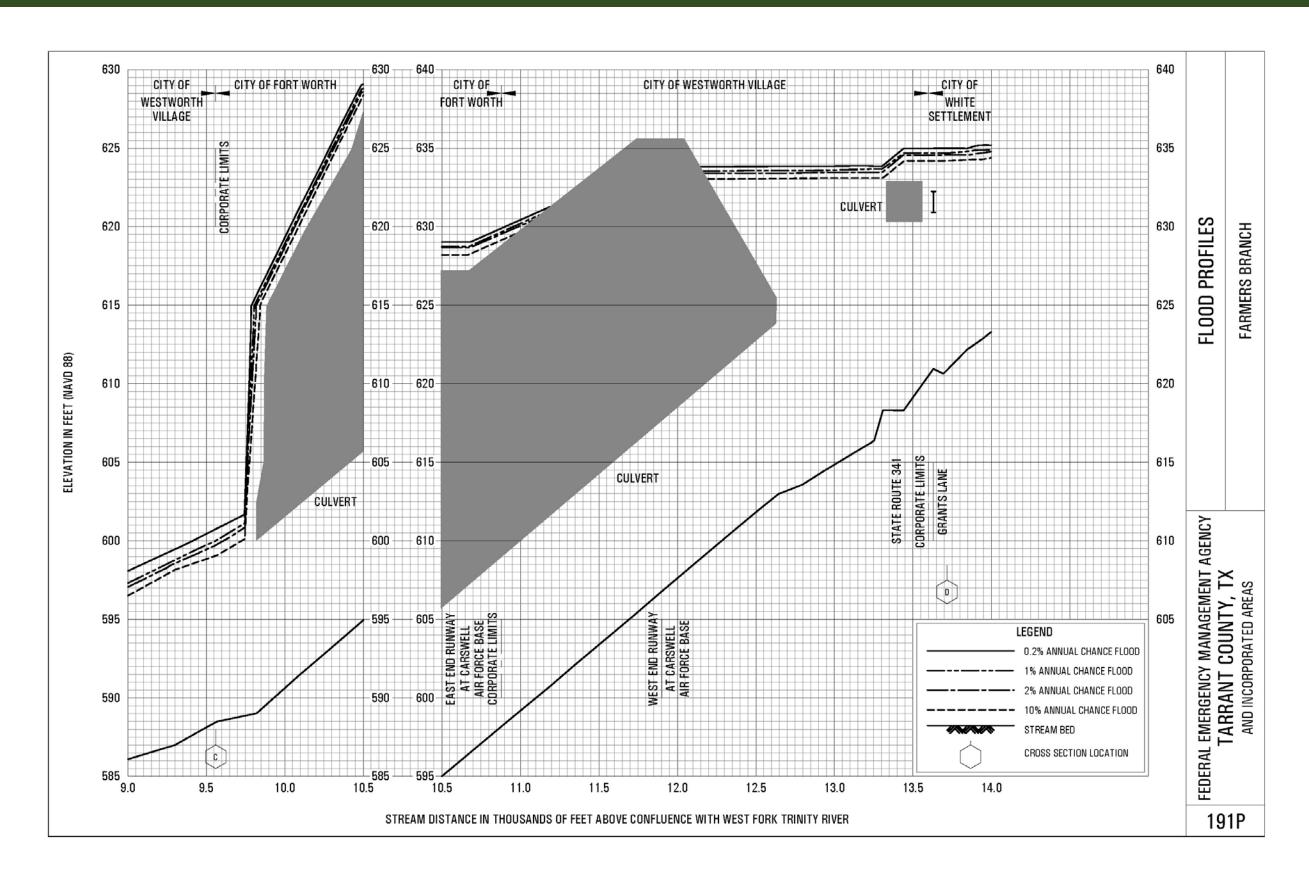












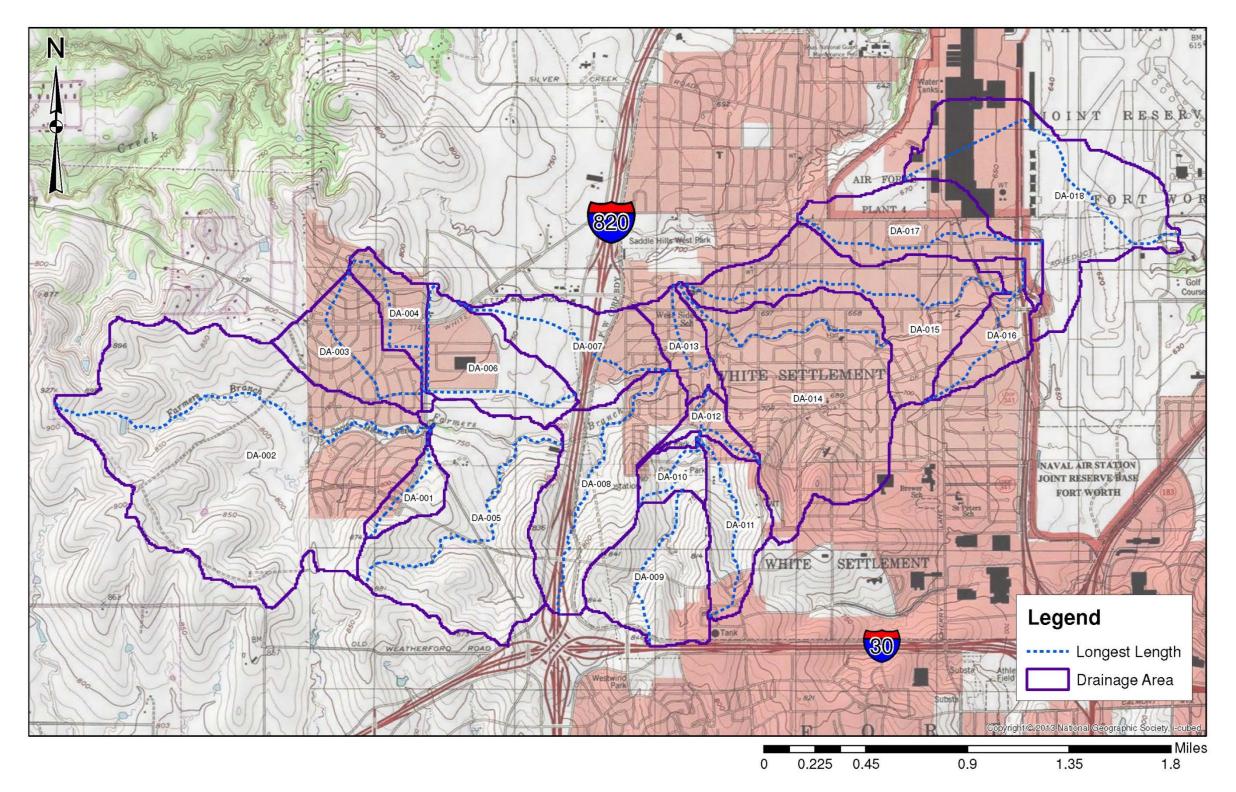
Appendix SW-D – Updated Hydrology with 2014 land use

- D.1 Drainage Area Map
- D.2 2014 Landuse Map
- D.3 NRCS Soils Map
- D.4 Table 6 Hydrologic Comparison

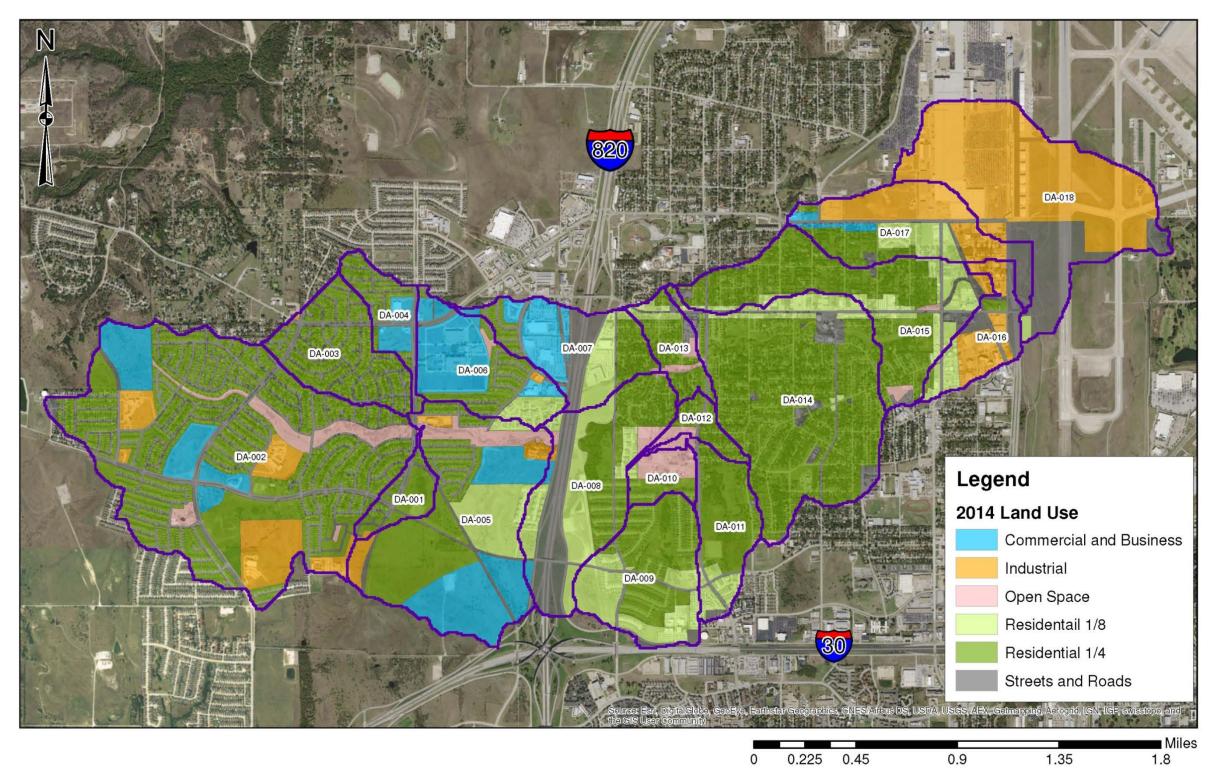
JOINING FORCES

Regional Joint Land Use Study

Appendix D.1: Drainage Area Map



Appendix D.2: 2014 Land Use Map



■Miles

1.8

1.35

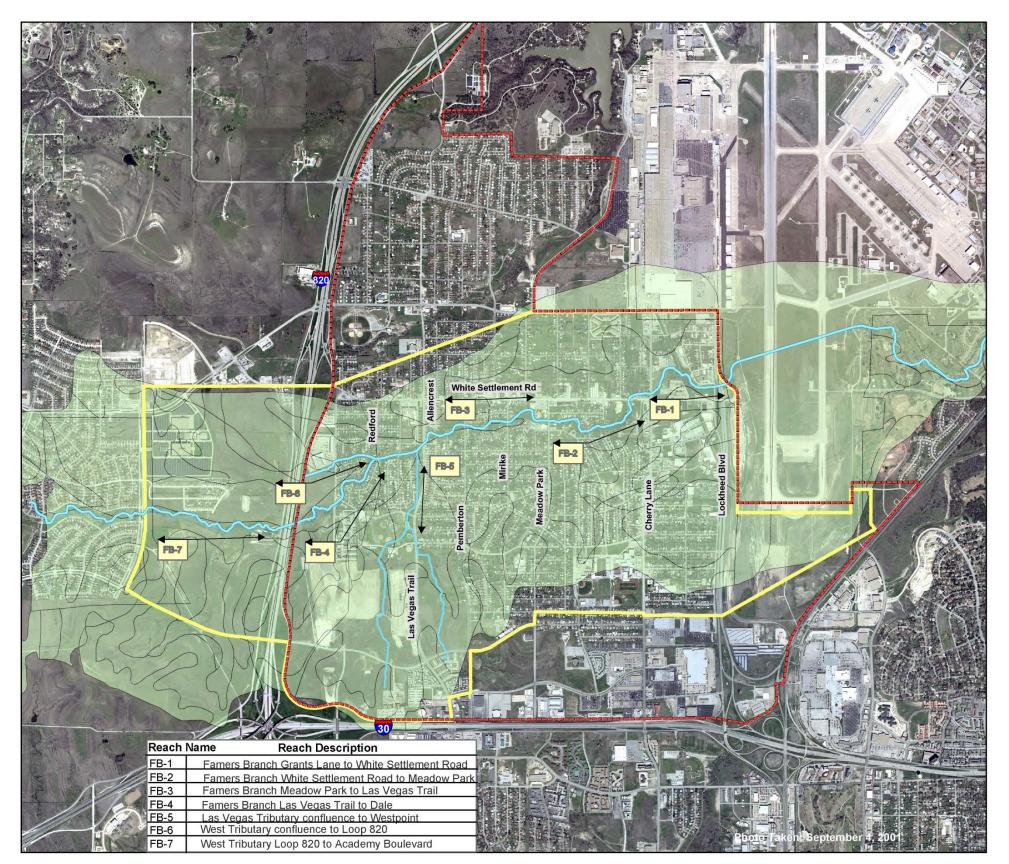
0.9

RESERV DA-018 DA-017 DA-004 DA-015 DA-007 DA-013 DA-003 DA-006 DA-014 DA-002 NAVAL AIR STATION JOINT RESERVE BASE FORT WORTH DA-010 DA-008 DA-011 WHITE SETTLEMENT Legend DA-009 **Hydrologic Soil Group** D

Appendix D.3: USDA NRCS Soils Map

0.225 0.45

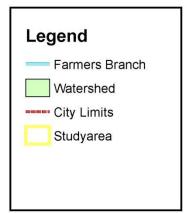
Appendix SW-E- Economic Damage Reaches

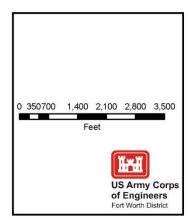




Regional Joint Land Use Study

Farmers Branch: Study Area





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.

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