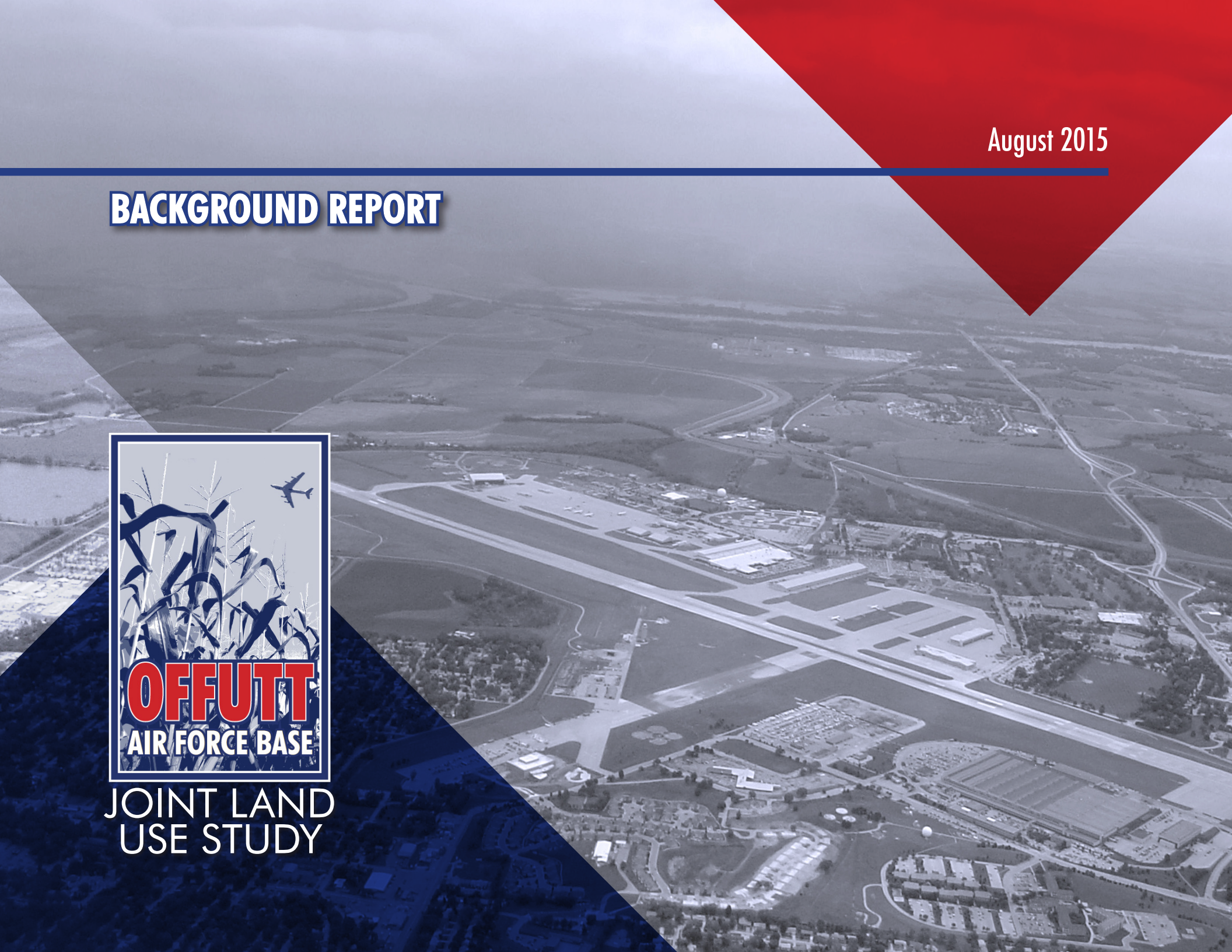
August 2015

BACKGROUND REPORT



OFFUTT AIR FORCE BASE

JOINT LAND USE STUDY

This study was prepared under contract with the Metropolitan Area Planning Agency (MAPA), with financial support from the Office of Economic Adjustment, Department of Defense. The content reflects the views of MAPA and the jurisdictions, agencies and organizations participating in the JLUS program, and does not necessarily reflect the views of the Office of Economic Adjustment.

OFFUTT AIR FORCE BASE

JOINT LAND USE STUDY

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BACKGROUND REPORT

Prepared Under Contract With:

MAPA

Metropolitan Area Planning Agency
2222 Cuming Street
Omaha, NE 68102

Prepared By:

Matrix DESIGN GROUP

August 2015

This study was prepared under contract with the Metropolitan Area Planning Agency (MAPA), with financial support from the Office of Economic Adjustment, Department of Defense. The content reflects the views of the JLUS partners involved in the development of this study and does not necessarily reflect the views of the Office of Economic Adjustment.

Policy Committee

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

- **Scott Belt,** *Chairman*
  Pottawattamie County Board of Supervisors
- **Jeffrey A. Bender,** *Senior Military Liaison Of Partnership (Former)*
  Greater Omaha Economic Development Partnership
- **Mary Ann Borgeson,** *Chairperson*
  Douglas County Commissioners
- **Michael Bowman,** *Mayor*
  City of Plattsmouth
- **Garry Gernandt,** *District #4 Councilmember*
  Omaha City Council
- **Ron Kohn,** *Board Member*
  Mills County Board of Supervisors
- **Col Charles Kuhl,** *55th Mission Support Group Commander*
  Offutt Air Force Base
- **Gayle Malmquist,** *Director*
  Back to the River
- **Tom Richards,** *District 3 Commissioner*
  Sarpy County Commissioners
- **Jim Ristow,** *President and CEO*
  Bellevue Chamber of Commerce
- **Rita Sanders,** *Mayor*
  City of Bellevue
- **Greg Youell,** *Executive Director*
  Metropolitan Area Planning Agency

Technical Advisory Committee

The Technical Advisory Committee (TAC) served a key role in the development of the Offutt AFB JLUS, providing the overall advisory support, review, and guidance of the study. The TAC comprised the following individuals:

- **Court Barber,** *Community Development Intern*
  City of La Vista
- **Doug Cook,** *Planning and Zoning Coordinator*
  Douglas County
- **Lynn Dittmer,** *Community and Economic Development Manager*
  Metropolitan Area Planning Agency
- **Winsley Durand,** *Senior Director of Recruitment*
  Omaha Chamber of Commerce
- **Bruce Fountain,** *Planning and Building Director*
  Sarpy County
- **April Gray,** *Base Community Planner (Former)*
  Offutt Air Force Base
- **Don Gross,** *Community Development Director*
  City of Council Bluffs
- **Mike Jensen,** *Zoning Administrator*
  Cass County
- **Brian Kissel,** *City Administrator*
  City of Glenwood
- **Kay Mocha,** *Planning and Development Director*
  Pottawattamie County
- **Erv Portis,** *City Administrator*
  City of Plattsmouth
- **Dr. Jeff Rippe,** *Assistant Superintendent*
  Bellevue Public Schools
- **Matt Roth,** *Planner*
  Metropolitan Area Planning Agency
- **Chris Shewchuck,** *Planning Director*
  City of Bellevue
- **Doug Shapland,** *Base Community Planner*
  Offutt Air Force Base
- **Chad Weaver,** *Comprehensive Planning Manager*
  City of Omaha
- **Darin Whatcott,** *Building and Zoning Official*
  Mills County
- **John Winkler,** *Manager*
  Papio-Missouri River Natural Resources District

Metropolitan Area Planning Agency

The Metropolitan Area Planning Agency (MAPA) served as the overall JLUS project management agency and the administrator of the Office of Economic Adjustment grant that helped to fund the study.

- **Greg Youell**
  Executive Director
- **Matt Roth**
  Planner, JLUS Project Manager
- **Lynn Dittmer**
  Community and Economic Development Manager
- **Sue Cutsforth**
  Communications Coordinator

JLUS Consultant / Technical Advisors

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

- **Rick Rust, AICP**
  Project Manager
- **Celeste Werner, AICP**
  Deputy Project Manager
- **Bren Cox, AICP**
  Lead Planner
- **Mike Hrapla**
  Military Liaison

Geographic information system (GIS) data that was used to create the background of the maps in this study was obtained from the following sources: US Census Bureau, 2014; National Hydrology Dataset, 2014; Esri, 2014; and National Agriculture Imagery Program, 2014 (for aerial imagery).

Please see the next page.

JOINT LAND USE STUDY

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Figures

Tables

Acronyms

A

AICUZ	Air Installation Compatible Use Zone
AFB	Air Force Base
AFI	Air Force Instruction
AG	Agriculture
AGL	Above Ground Level
AHAS	Avian Hazard Advisory System
APZ	Accident Potential Zone
AQCR	Air Quality Control Regions
AT/FP	Anti-Terrorism/Force Protection
ATC	Air Traffic Control
AV	Aviation Overlay District
AQ	Air Quality

B

BAH	Base Allowance for Housing
BASH	Bird / Wildlife Aircraft Strike Hazard
BG	General Business
BGH	Heavy General Business
BGM	Metropolitan General Business
BHWG	Bird Hazard Warning Group
BIO	Biological Resources
BMPs	Best Management Practices
BNH	Heavy Neighborhood Business
BNSF	Burlington Northern Santa Fe

C

C	Commercial
CC	Community Commercial
CFR	Code of Federal Regulations
CNEDC	Cass County Nebraska Economic Development Council
CO	Carbon Monoxide
COM	Communication / Coordination
CR	Cultural Resources
CSRIC	Communication Security, Reliability, and Interoperability Council
CWA	Clean Water Act
CWECS	Commercial/Utility Grade Wind Energy Conversion System
CZ	Clear Zone

D

dB	decibel
DMV	Department of Motor Vehicles
DNL	Day-Night Level
DNR	Department of Natural Resources
DOD	Department of Defense
DOE	Department of Energy
DPAA	Defense Prisoner of War / Missing in Action Accounting Agency
DSS	Dust/ Smoke/ Steam

E

EA	Environmental Assessment
ECFs	Entry Control Facilities
ED	Energy Development
EIS	Environmental Impact Assessment
EPA	Environmental Protection Agency
ESA	Endangered Species Act
ETJ	Extraterritorial Jurisdiction

F

FAA	Federal Aviation Administration
FCC	Federal Communications Commission
FEMA	Federal Emergency Management Agency
FESA	Federal Endangered Species Act
FGZ	Federal Government Zone
FLPMA	Federal Land Management and Policy Act
FONSI	Finding of No Significant Impact
FSC	Frequency Spectrum Capacity
FSI	Frequency Spectrum Impedance/ Interference
FX	Flex Space
FY	Fiscal Year

G

GC	General Commercial
GI	General Industrial
GIS	Geographic Information Systems
GO	General Office
GOEDP	Greater Omaha Economic Development Partnership

H

HA	Housing Availability
HCO	Highway 34 Corridor Overlay
HCP	Habitat Conservation Plan
HFGCS	High Frequency Global Communications System
HI	Heavy Industrial
HO	Height and Obstruction
HUD	Housing and Urban Development

I

I	Interstate
ICEMAP	Installation Complex Encroachment Management Action Plan
ICRMP	Integrated Cultural Resources Management Plan
IE	Infrastructure Extensions
ILS	Instrument Landing System
INRMP	Integrated Natural Resources Management Plan
IS	Intelligence Squadron

J

JLUS	Joint Land Use Study

L

LAS	Land/ Air/ Sea Space Competition
LC	Limited Commercial
LEG	Legislative Initiatives
LG	Light and Glare
LH	Loess Hills Conservation Development
LLC	Limited Liability Company
LOS	Level of Service
LRAD	Long Range Acoustic Device
LU	Land Use

M

MAPA	Metropolitan Area Planning Agency
MAR	Marine Environments
MH	Mobile Home Residential
MOU	Memorandum of Understanding
MSA	Metropolitan Statistical Area

N

NAAQS	National Ambient Air Quality Standard
NACo	National Association of Counties
NBD	Neighborhood Business District
NDEQ	Nebraska Department of Environmental Quality
NDNR	Nebraska Department of Natural Resources
NDOR	Nebraska Department of Roads
NEANGE	Nebraska Air National Guard
NEPA	National Environmental Policy Act
NFIP	National Flood Insurance Program
NFS	Nebraska Forest Service
NGOs	Nongovernmental Organizations
NHPA	National Historic Preservation Act
NISC	Nebraska Invasive Species Council
NLR	Noise Level Reduction
NO2	Nitrogen Dioxide
NOAA	National Oceanic and Atmospheric Administration
NOI	Noise
NPDES	National Pollutant Discharge Elimination System
NTIA	National Telecommunications and Information Administration
NVG	Night Vision Goggles
NZ	Noise Zones

O

O	Office
O3	Ozone
OAC	Offutt Advisory Council
OAFCO	Offutt AFB America First Communities, LLC
OEA	Office of Economic Adjustment
OS	Open Space Conservation
OSM	Office of Spectrum Management

P

PC	Policy Committee
PM	Particulate Matter
PM10	Course Particle
PM2.5	Fine Particles
PO	Parking Overlay
ppb	parts per billion
PT	Public Trespassing
PUD	Planned Unit Development
PV	Photovoltaic System

R

R	Residential
RC	Roadway Capacity
RCS	Recovery Credit System
RE	Residential Estates
REPI	Readiness and Environmental Protection Integration
RF	Radio Frequency
RG	General Residence
RS	Single-Family Residence

S

SA	Safety
SAC	Strategic Air Command
SCW-1	Strategic Communications Wing One
SDWA	Safe Drinking Water Act
SFS	Security Forces Squadron
SGHAT	Solar Glare Hazard Analysis Tool
SHPO	State Historic Preservation Office
SNR	Scare Natural Resources
SO2	Sulfur Dioxide
SREDC	Sarpy County Economic Development Corporation
STRATCOM	Strategic Command

T

TAC	Technical Advisory Committee
TIF	Tax Increment Financing

U

UAVs	Unmanned Aerial Vehicles
UFC	United Facilities Criteria
UP	Union Pacific
URS	URS Group, Inc.
US	United States/ United States Route
USACE	United States Army Corps of Engineers
USAHAS	United States Avian Hazard Advisory System
USFWS	United States Fish and Wildlife Service
USSTRATCOM	United States Strategic Command

V

V	Vibration
V	Village
VFR	Visual Flight Rules
VO	Vertical Obstructions

W

WECS	Wind Energy Conservation System
WQQ	Water Quality/ Quantity

Please see the next page.

Introduction 1.

JOINT LAND USE STUDY

Please see the next page.

Introduction 1.

Inside Chapter 1...

1.1 Introduction

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

There are several communities around Offutt AFB, both in Nebraska and Iowa that participated as partners in this JLUS. In Nebraska, these communities are: the cities of Bellevue, La Vista, Omaha, Papillion, and Plattsmouth, as well Cass County, Douglas County, and Sarpy County. In Iowa, these are the cities of Council Bluffs and Glenwood, as well as Mills County and Pottawattamie County. An organized communication effort between these jurisdictions, Offutt AFB, and other stakeholder entities that own or manage land or resources in the region is needed to ensure that future growth around Offutt AFB is coordinated and compatible with military training activities.

1.2 What Is a Joint Land Use Study?

A JLUS is a planning process accomplished through the collaborative efforts of a comprehensive list of stakeholders in a defined study area in order to identify compatible land uses and growth management practices in communities close to active military installations. These stakeholders include local community, state, and federal officials, residents, business owners, nongovernmental organizations, and the military.

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

A JLUS results in a set of recommendations or potential strategies that can be implemented by identified stakeholders to promote compatible development and relationships between the military and neighboring communities for the present and future. As such, a JLUS may become an adopted plan for establishing compatible land use regulations, but does not itself enact any new regulations or policies.

Although primarily federally funded by the Department of Defense (DOD), Office of Economic Adjustment (OEA), a JLUS is produced by and for local communities. The project management entity for the Offutt AFB JLUS is the Metropolitan Area Planning Agency (MAPA).

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

1.3 JLUS Goal

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

1.4 JLUS Objectives

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

- Understanding. Convene community and military representatives to identify, confirm, and understand the compatibility issues in an open forum, taking into consideration both community and Offutt AFB perspectives and needs. This includes public awareness, education, and input as part of a cohesive outreach program.
- Collaboration. Encourage cooperative land use and resource planning by Offutt AFB and surrounding communities so that future community growth and development are compatible with the training and operational missions at Offutt AFB, while at the same time seeking ways to reduce operational impacts on adjacent lands.
- Actions. Provide a set of mutually supported tools, activities, and procedures (strategies) that local jurisdictions, agencies, and Offutt AFB can implement tin order to avoid and reduce compatibility issues. The strategies proposed include both operational measures to mitigate installation impacts on surrounding communities, and local government and agency approaches to reduce community impacts on military operations. These strategies will help decision makers resolve compatibility issues and prioritize projects within the annual budgeting process of their respective entity / jurisdiction.

Why Prepare a Joint Land Use Study?

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

The Offutt AFB JLUS is a proactive approach to encourage increased communication and foster relationships among all JLUS stakeholders and partners.

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

1.5 Regional Economic and Local Importance

Offutt AFB is located in east-central Nebraska, 10 miles south of downtown Omaha (See Figure 1-1). It is adjacent to the City of Bellevue in Sarpy County and is just west of the border of Iowa. Offutt AFB is an important economic engine in the region, which supported approximately 20,000 people in fiscal year (FY) 2013, including 5,637 military personnel, 4,699 civilians, and the remaining were military dependents. Additionally, 23,741 military retirees reside within 150 miles of Offutt AFB. In FY 2013, Offutt AFB's economic benefit to local communities was greater than $1.3 billion.

1.6 Military Strategic Importance

Aside from being a significant economic generator for the region, Offutt AFB is a strategic asset in the nation's defense. The host unit at Offutt AFB is the 55th Wing, which is the largest wing within the Air Force's Air Combat Command. Additionally, the base is home to many important associate units, including US Strategic Command (USSTRATCOM) Headquarters, which is one of the DOD's nine unified commands. It is also home to the 557th Weather Wing, the Defense Prisoner of War / Missing in Action Accounting Agency, and many more tenants. The 55th Wing provides protection through intelligence, reconnaissance, surveillance and other command and control protocols, along with combat ready warfighters in time of crisis.

Another important factor of Offutt AFB is its strategic location within the center of the country. The installation's central location gives the base an advantage by being within a far enough distance from each coast, protecting the site from outside threats. In a time of national crisis Offutt AFB is utilized for presidential protection. Additional details on Offutt AFB's missions and activities are described in Chapter 3, Military Profile.

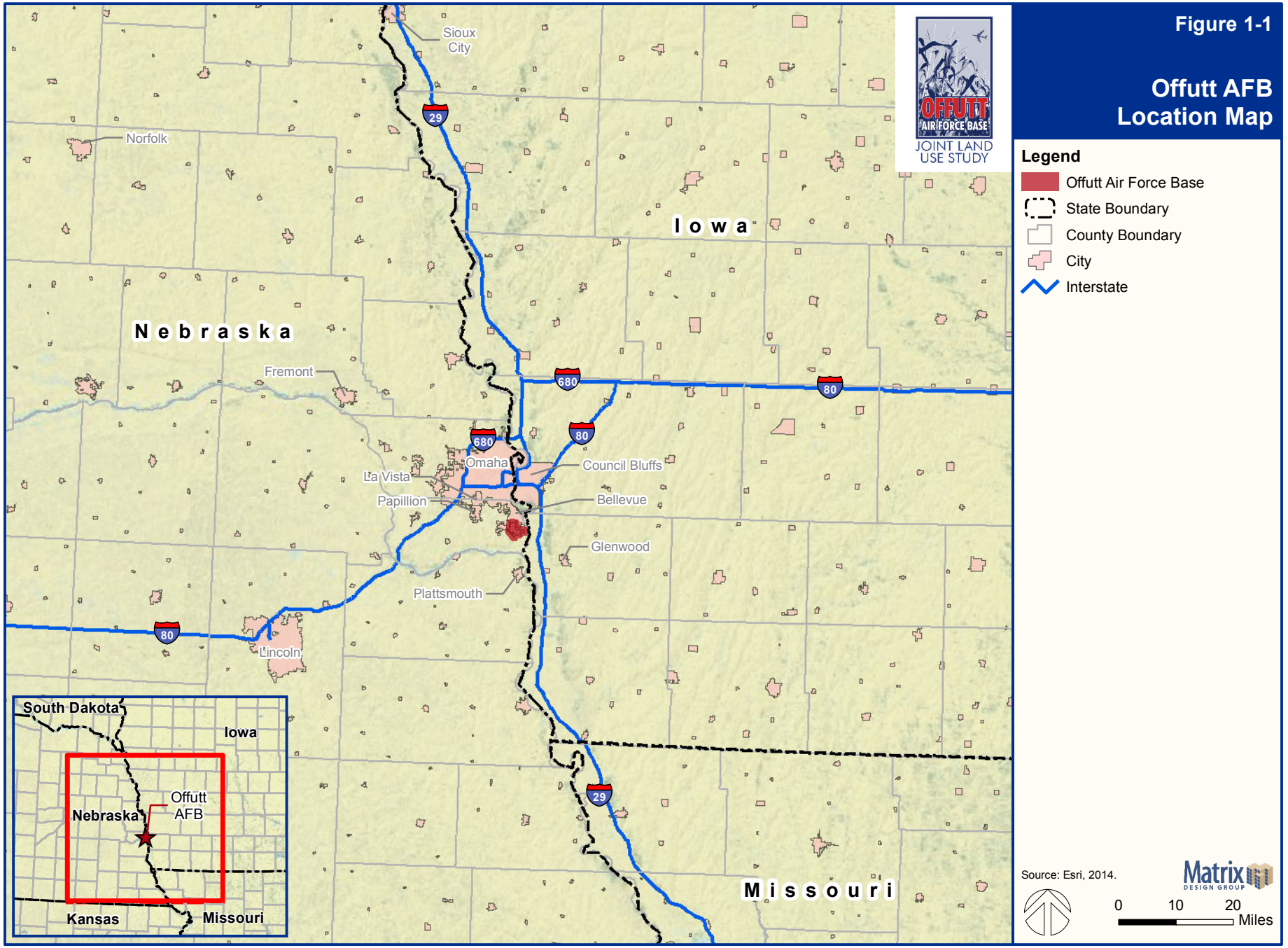
Figure 1-1
Offutt AFB Location Map
Legend
Offutt Air Force Base
State Boundary
County Boundary
City
Interstate
Sioux City
Norfolk
Fremont
Omaha
La Vista
Papillion
Council Bluffs
Bellevue
Glenwood
Plattsmouth
Lincoln
Iowa
Nebraska
Missouri
29
680
80
South Dakota
Iowa
Nebraska
Offutt AFB
Kansas
Missouri
Source: Esri, 2014.
0 10 20
Miles

1.7 Local Communities Working Together

Offutt AFB contributes much more than just an economic engine. The base interacts with the community through actions both related and independent to the military. Offutt AFB hosts a variety of community events throughout the year, including base tours, holiday breakfasts/lunches, awards ceremonies, memorial ceremonies, etc.

Defenders Freedom Open House and Air Show, 2011

Veterans Day Parade, 2013

Missouri River flooding collaboration, June 2011

Offutt AFB engages in many public outreach efforts to make itself a greater part of the local and regional community.

- The base participates in an annual Community Assessment Survey in order to contribute to the quality of life and well-being of individuals affected by the base. The results allow base leadership to identify strengths and weaknesses within the community and provide opportunities for improvements and changes to the way Offutt AFB affects the surrounding areas.
- Marriage and family enrichment programs are provided to military families at the Offutt Marriage and Family Ministry Center. The newly remodeled building once served as the headquarters for Fort Crook during World War II.
- Many groups on the base take part in an adopt-a-highway program aimed at giving back to the community by keeping several portions of local highways clean.
- Offutt AFB has received praise over its environmental improvement efforts. The base was named a Tree City USA as a result of its comprehensive urban forestry program.
- The base works with local communities through an array of events and parades. Each year, hundreds of Offutt AFB personnel volunteer in the official Veteran's Day parade for the state of Nebraska.
- The Offutt AFB Defenders Freedom Open House and Air Show allows the public to attend a free open house on the base. Attendees can watch air performances by some of the most talented pilots in the world, view a vast array of aircraft on the ground, and experience a diverse group of exhibitors.
- The Offutt AFB Appreciation Day Picnic is an annual event for the military personnel and their families at the Offutt Base Lake. The picnic provides attendees food, drinks, live music, and activities for kids including rock climbing, face painting, bouncy castles, and a petting zoo.

- The Bellevue Chamber of Commerce and Offutt AFB work with the Bellevue Medical Center to present the annual Runway Run. The seven mile run is open to those who register and occurs on a certified USATF course that is placed through historical areas of the base and along the runway.
- The Heartland of America Band performs concerts and recordings for Offutt AFB and the local communities. Its mission focuses on enhancing military morale, inspiring patriotism and confidence in the DOD, and promoting positive community relations throughout the State of Nebraska.
- The Offutt AFB Honor Guard provides ceremonial funeral honors for active duty, veterans, and retirees of the Air Force and Army Air Corps. Its area of responsibility covers 100,000 square miles and serves the entire State of Iowa, 70 counties in Nebraska, and three counties in Kansas.

1.8 Public and Stakeholder Outreach

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

Stakeholders

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

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

Policy Committee and Technical Advisory Committee

The development of the Offutt AFB JLUS was guided by two committees, comprising staff from cities, counties, Offutt AFB, federal and state agencies, resource agencies, local governments, and other stakeholders. The two committees are the Policy Committee (PC) and the Technical Advisory Committee (TAC).

JLUS Policy Committee: The PC consists of elected officials and decision makers from participating jurisdictions, military installation leadership, and representatives from other interested and affected agencies. The PC was responsible for guiding the direction of the JLUS, preparing and approving the study design, approving policy recommendations, and approving the draft and final JLUS documents.

JLUS Technical Advisory Committee: The TAC was responsible for identifying and studying technical issues. Membership includes representatives from local jurisdictions, agencies, and Offutt AFB with technical expertise in one or more of the compatibility factors listed in Chapter 5, Compatibility Assessment. The TAC identified and addressed

technical issues, provided feedback on report development, and assisted in the development and evaluation of implementation strategies and tools.

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

Table 1-1. JLUS Sponsor Responsibilities and Participants

Responsibilities	Participants
▪ Coordination ▪ Accountability ▪ Grant Management ▪ Financial Contribution	▪ Office of Economic Adjustment ▪ Metropolitan Area Planning Agency

Table 1-2. JLUS PC Responsibilities and Participants

Responsibilities	Participants
▪ Policy Direction ▪ Study Oversight ▪ Monitoring ▪ Report Adoption	▪ Back to the River ▪ Bellevue Chamber of Commerce ▪ City of Bellevue, NE ▪ City of Omaha, NE ▪ City of Plattsmouth, NE ▪ Greater Omaha Economic Development Partnership ▪ Douglas County. NE Commissioners ▪ Metropolitan Area Planning Agency ▪ Mills County Board of Supervisors, IA ▪ Offutt Air Force Base ▪ Pottawattamie County, IA Commissioners ▪ Sarpy County, NE Commissioners

Table 1-3. JLUS TAC Responsibilities and Participants

Responsibilities	Participants
▪ Identify Issues ▪ Provide Expertise to Address Technical Issues ▪ Evaluate and Recommend Implementation Options to the PC ▪ Provide Draft and Final Report Recommendations to the PC	▪ Bellevue Public Schools ▪ Cass County, NE ▪ City of Bellevue, NE ▪ City of Council Bluffs, IA ▪ City of Glenwood, IA ▪ City of La Vista, NE ▪ City of Omaha, NE ▪ City of Plattsmouth, NE ▪ Douglas County, NE ▪ Metropolitan Area Planning Agency ▪ Mills County, IA ▪ Offutt Air Force Base ▪ Omaha Chamber of Commerce ▪ Papio Missouri River NRD ▪ Pottawattamie County, IA ▪ Sarpy County, NE

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

- Project Kick-Off / Meeting #1 (May 14, 2014): The project kick-off meeting was held as a joint meeting with both the PC and TAC. The purpose of the project kick-off meeting was to outline the JLUS process and goals, educate all stakeholders about the Offutt AFB JLUS and their roles and responsibilities in the process. Additional topics discussed included the project Study Area, review of issues identified, refinement of the project timeline, review lessons learned from other JLUS projects, and identification of any additional compatibility issues.
- Meeting #2 (September 15, 2014): The second committee meeting was conducted as a bus tour of Offutt AFB. It occurred on Offutt AFB via bus and provided an overview of the base, its operations, and the geographic locations and facilities on-base.

- **Meeting #3 (January 7, 2015 [TAC] and January 8, 2015 [PC]):** The third meeting conducted with the PC and TAC included a review of potential data gaps, review of issues identified to date, and presentation draft of findings. Any additional issues were added and summarized along with general notes on issues, goals, and concerns identified to date.
- **Meeting #4 (March 12, 2015):** This set of committee meetings focused on the development of strategies to address the identified compatibility issues. A draft set of strategies was developed prior to the meeting and was improved upon, added to, and revised during the course of the meetings. These strategies were further refined after the meeting.
- **Meeting # 5 (June 15, 2015):** The fifth set of committee meetings had two main purposes. The first one was to review the Committee Draft Background Report and discuss findings to be incorporated to prepare it for Public Draft. The second goal was to refine and finalize a list of draft strategies for inclusion in the Public Draft JLUS Report.
- **Meeting # 6 (August 20, 2015):** The final committee meeting was held as a joint meeting with the TAC and PC. During this meeting, all public comments that were received during the public comment period (July 15 through August 15, 2015) were reviewed and final changes for the JLUS documents were agreed upon. The final JLUS and Background Report were approved during this meeting. Lastly, the meeting included a discussion of the next steps after the JLUS process and options for implementing the JLUS strategies.

Policy Committee Meeting Number 3, January 8, 2015

Public Workshops

In addition to the PC and TAC meetings, a series of public workshops were held throughout the development of the JLUS. These workshops provided an opportunity for the exchange of information with the greater community, assisted in identifying the issues to be addressed in the JLUS, and provided input on the proposed strategies. Each workshop included a traditional presentation and a facilitated exercise providing a "hands on," interactive opportunity for the public to participate in the development of the plan. The public workshops conducted are highlighted as follows:

- **Public Workshop #1 (January 7, 2015, Bellevue Schools Support Center):** The focus of this workshop was to explain the purpose and function of the JLUS, provide an overview of the military operations at Offutt AFB, introduce project participants, share the JLUS approach and discuss the JLUS foals. The format of this meeting included a presentation to the public followed by an interactive working session where attendees were encouraged to share their input on potential JLUS issues. A user-friendly JLUS Project Overview (JLUS Update #1) was distributed at this workshop to provide the public a tool in completing a compatibility issues exercise. Attendees worked in groups around large scale Study Area maps to complete a compatibility issues worksheet as well as engage in intimate group discussions with the JLUS team. Participants were able to provide input through interactive audience response systems that allow for immediate response viewing and tracking.
- **Public Workshop #2 (March 11, 2015, Bellevue Volunteer Firefighters Hall):** The second public workshop provided a chance to review and comment on the compatibility issues that have been identified for evaluation as part of the JLUS and provide input on the prioritization of the issues identified. The issues that were presented were developed based on inputs from the Policy and Technical Advisory Committees (made up of representatives from the jurisdictions, agencies and organizations involved in this project) and public inputs provided at the first Public Workshop held on January 7, 2015. A set of large-format maps showing operations "footprints" for Offutt (noise contours, imaginary surfaces, etc.) were posted on the walls for the public to review during the open house portion of the workshop. This workshop also introduced the next phase of the JLUS process, which is the development of strategies to address the compatibility issues.
- **Final Draft Report Distributed Public Workshop #3 (July 28, 2015, Bellevue University Administrative Services Building):** The third and final public workshop was held during the Public Draft review and comment period (July 15 through August 15, 2015). Attendees of the workshop were given a brief summary of the JLUS process and were provided with a breakdown of the JLUS Report and Background Report chapters and how the compatibility issues were addressed. A focus of the meeting was the JLUS Implementation Plan (Chapter 6 of the JLUS Report), how the strategies were developed, and how to read the strategies. The process for submitting comments on the draft was explained and all attendees were encouraged to review the documents and provide any comments or concerns they have.

Public Workshop Number 1, January 7, 2015

Public Outreach Materials


FACT SHEET #1: OVERVIEW / FACTORS

OFFUTT AIR FORCE BASE

JOINT LAND USE STUDY

JLUS Overview Fact Sheet: At the beginning of the JLUS project, a JLUS Overview Fact Sheet was developed that describes the JLUS program, objectives, methods for the public to provide input into the process, an overview of the 25 compatibility factors that were analyzed throughout the project, and the proposed Offutt AFB JLUS Study Area. This Fact Sheet was made available at the workshops and posted on the project website for download.


FACT SHEET #2: STRATEGY TOOLBOX

OFFUTT AIR FORCE BASE

JOINT LAND USE STUDY

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

Website: A project website was developed and maintained to provide stakeholders, the public, and media representatives with access to project information. This website was maintained for the entire duration of the project to ensure information was easily accessible. Information on the website included program points of contact, schedules, documents, maps, public meeting information, and a link to submit comments. The project website is located at www.offuttjlus.com.

1.9 JLUS Study Area

The Offutt AFB JLUS Study Area is designed to address all lands near Offutt AFB that may impact current or future military operations or be impacted by operations. Located within Sarpy County, the surrounding communities' land uses include a variety of residential, commercial, industrial and agricultural uses. The primary characteristics evaluated in determining the Study Area was general compatibility factors associated with military mission readiness and land uses that may impact or be impacted by military operations. Figure 1-2 illustrates the extent of the Study Area.

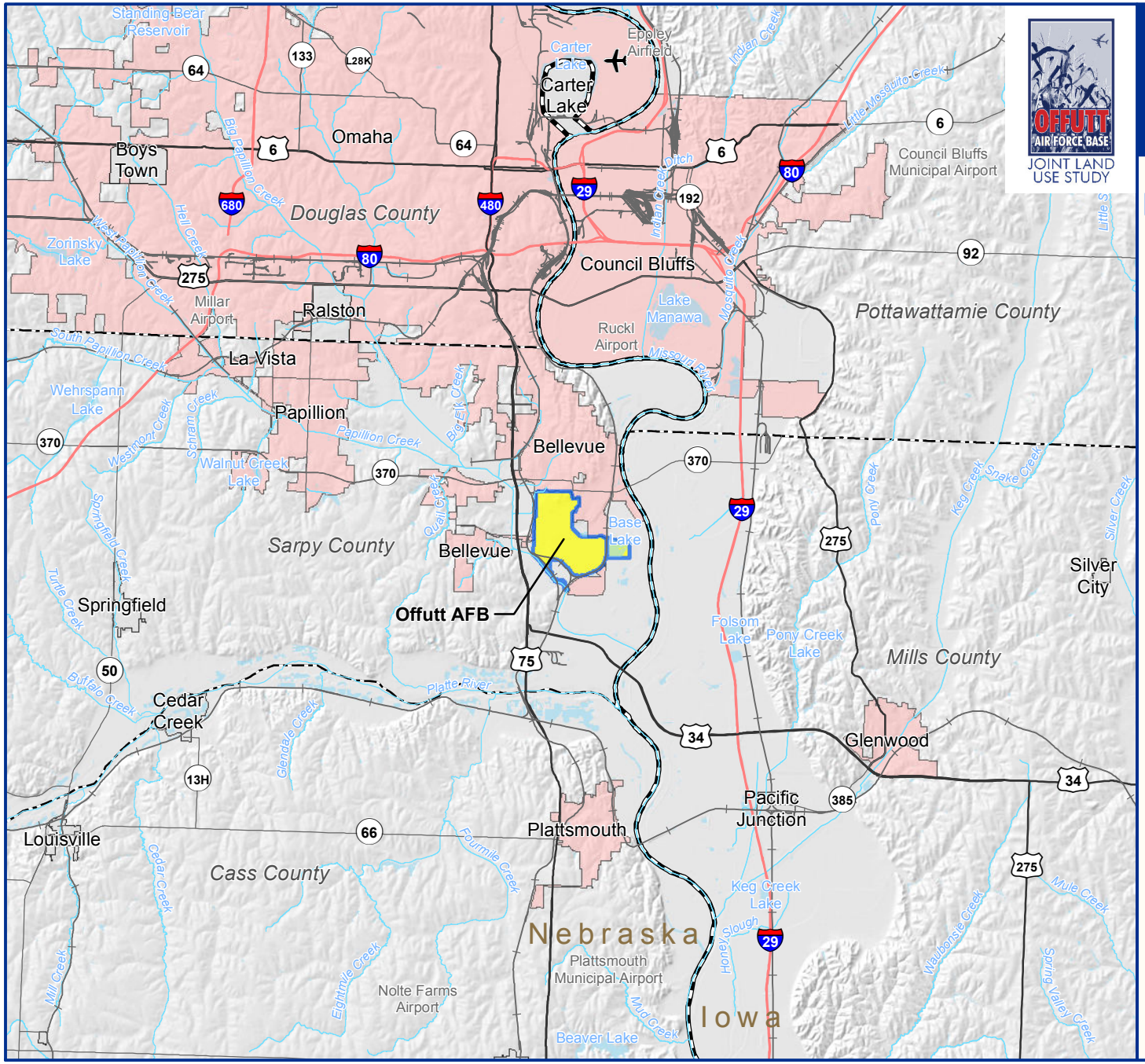

Figure 1-2

Offutt AFB JLUS Study Area

Legend

- Offutt Air Force Base
- State Boundary
- County Boundary
- City included in JLUS
- Other City
- Water Body
- River / Creek / Stream
- Interstate
- Federal Highway
- State Highway
- Railroad
- Eppley Airfield

Source: Offutt AFB, 2014.

Matrix Design Group

0 2 4 Miles

1.10 JLUS Organization

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

JLUS Report

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

JLUS Executive Summary Brochure

An Executive Summary brochure was prepared in conjunction with the Final JLUS Report. This graphical brochure provides a brief overview of the JLUS project and process and highlights the major compatibility issues and recommended strategies to address them. It also includes Offutt AFB operational footprint maps and descriptions of each footprint.

Background Report

Chapter 1: Introduction

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

Chapter 2: Community Profile

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

Chapter 3: Military Profile

The military profile chapter discusses the military presence and activities that take place within the JLUS Study Area. An overview of the Offutt AFB is discussed, as well as the military operations that take place there. A brief history and the discussion for Offutt AFB also include information on the units and schools that operate out of the base. It is important to identify the military operating areas and current and possible future missions that take place in the Study Area to get an idea of how the military operations could potentially impact, or be impacted by, the surrounding communities. For this reason, Chapter 3 includes a discussion and associated maps describing the military footprint of Offutt AFB.

Chapter 4: Existing Compatibility Tools

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

Chapter 5: Compatibility Assessment

Compatibility, in relation to military readiness, can be defined as the balance or compromise between community needs and interests and military needs and interests. In this chapter, the JLUS presents the compatibility issues identified for the Offutt AFB JLUS. These issues were identified based on input from the PC and TAC, members of the public, existing plans and technical reports, and evaluation by the project team. This chapter categorizes the issues into the following 25 compatibility factors:

- Air Quality (Section 5.1)
- Anti-terrorism / Force Protection (Section 5.2)
- Biological Resources (Section 5.3)
- Climate Adaptation (Section 5.4)
- Coordination / Communication (Section 5.5)
- Cultural Resources (Section 5.6)
- Dust / Smoke / Steam (Section 5.7)
- Energy Development (Section 5.8)
- Frequency Spectrum Capacity (Section 5.9)
- Frequency Spectrum Impedance / Interference (Section 5.10)
- Housing Availability (Section 5.11)
- Infrastructure Extensions (Section 5.12)
- Land / Air / Sea Spaces (Section 5.13)
- Land Use (Section 5.14)
- Legislative Initiatives (Section 5.15)
- Light and Glare (Section 5.16)
- Marine Environments (Section 5.17)
- Noise (Section 5.18)
- Public Trespassing (Section 5.19)
- Roadway Capacity (Section 5.20)
- Safety Zones (Section 5.21)
- Scarce Natural Resources (Section 5.22)
- Vertical obstructions (Section 5.23)
- Vibration (Section 5.24)
- Water Quality / Quantity (Section 5.25)

Please see the next page.

Please see the next page.

Inside Chapter 2...

2.1 Introduction

This chapter provides important information about the civilian entities within the Offutt Air Force Base (AFB) Joint Land Use Study (JLUS) Study Area. The Study Area for this JLUS includes Offutt AFB and its surrounding communities. Within the state of Nebraska, the communities are the City of Bellevue, City of La Vista, City of Omaha, City of Papillion, City of Plattsmouth, Cass County, Douglas County and Sarpy County. Within the state of Iowa, the communities are the City of Council Bluffs, City of Glenwood, Mills County, and Pottawattamie County. The Study Area is discussed and shown on maps in Chapter 1, Introduction.

2.2 JLUS Study Area Regional Overview

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

This chapter is also designed to enhance the Base's understanding of the types of activities occurring "outside the fence" so that, military leadership can apply those insights when considering future missions and operations.

History and Profile

Cass County

Cass County, in southeastern Nebraska, covers over 550 square miles of land adjacent to the Nebraska-Iowa border. The county is bordered by the Missouri River on the east, Platte River and Sarpy County on the north, Otoe County on the south, and Lancaster and Saunders Counties on the west. There are three US Highways (US 75, US 34, and US 6) and one interstate (Interstate 80) that run through the county, connecting it with the four bordering counties. The largest city in Cass County is the City of Plattsmouth, which is also the county seat.

The land which now composes Cass County was discovered by Meriwether Lewis and William Clark in 1804 during their expedition along the Missouri River. They camped and passed through the county before reaching the mouth of the Platte River. The county, one of the earliest settled counties in the state, was approved in 1855 by Territorial Legislature. It was named after General Lewis Cass, who was a key political activist during the Kansas-Nebraska bill. The area within the county itself was originally settled for the use of trading posts due to its proximity to the Missouri and Platte Rivers. Over the next 150 years, numerous towns were incorporated into the county. While many of these settlements no longer exist, there are fifteen towns currently in Cass County. Today the county is supported by a vast array of locally-owned and operated businesses. This emphasis on small businesses contributes to the retail trade industry's large economic importance within the county.

Fisheries, mining and construction also play important roles by utilizing the natural resources of the area and building infrastructure around a growing population, respectively.

The Cass County Board of Commissioners is tasked with managing county funds and property by adopting the county budget and setting tax levies and county salaries. The board consists of one elected representative from each of the five county districts, each of whom serves four-year terms.

City of Plattsmouth

The City of Plattsmouth is located in the northwest corner of Cass County. It is situated along the Nebraska-Iowa border, approximately 21 miles southeast of Omaha, and accessible via US Highway 75. It serves as Cass County's largest city and county seat. The city is somewhat isolated, located more than six miles from the nearest town.

The Otoe Tribe are the first known settlers of the area, but it rose to prominence when Sam Martin established it as a trading post in 1854 intending to cater to the increasing ferry traffic along the Missouri River. Plattsmouth's location at the junction of the Missouri and Platte Rivers made it an attractive trade and travel destination upon its foundation. The wealthier residents built lavish homes along its Main Street, and many of these historic homes are still in functional use today. Transportation played an increasing role beginning in the late 1800s because the city was home to Burlington & Missouri railroad infrastructure. The rail industry in Plattsmouth ended by the 1960s, and a city park now occupies the land once situated by Burlington Railroad's buildings and equipment. Post-war housing and baby boom fuelled a massive population increase throughout the latter half of the 20th century. The main industries for the city are in the education, health, and social services, construction, and retail trade industries.

The decision-making is made primarily by the mayor and eight city council members. Each of these elected positions serves four-year terms. The mayor is the go-to for broad visioning and key decisions, and the city council handles the day-to-day budgetary and administrative decisions and operations.

Douglas County

Douglas County covers over 328 square miles of land adjacent to the Nebraska-Iowa border in central-eastern Nebraska. Three US highways and one interstate highway run through the county and connect it with five other bordering counties. Pottawattamie, Iowa borders to the east, Sarpy County including Offutt AFB to the south, Saunders County to the west, Dodge County to the northwest, and Washington County to the north.

The largest city and county seat of the county is the City of Omaha, which is Nebraska's most populous city.

The county was established in 1854 and bears the name of Stephen Douglas, the renowned US senator who introduced the Kansas-Nebraska Act in 1854. Military presence in the county can be traced back to the late 1800s, when barracks were established in the county to protect railroad workers and settlers. The exponential boom in settlers migrating west to Douglas County caused an eventual bust when over-expansion and drought damaged the regional economy. Further drought and the stock market crash left the county in economic despair until the mid-1900s, when the livestock market and a Western Electric power plant helped to revitalize Douglas County. The county forms one of the largest metropolitan areas along the Missouri River due to the influence of Omaha as its largest city. It benefits from a diverse employment base and economy, but today is nationally known as an insurance and telemarketing hub.

The Douglas County Board of Commissioners are tasked with policymaking and legislative authority. The board passes resolutions, adopts the budget, and appoints other administrative officials. The board consists of one elected representative from each of the seven county districts, each of whom serves four-year terms. The Chief Administrative Officer serves as the administrator for the board, carrying out day-to-day decisions in the vested interests of the board.

City of Omaha

The City of Omaha is located in Douglas County, along the Nebraska-Iowa border. It is approximately 53 miles northeast of the state capitol in Lincoln and accessible via I-80. It is the most populous city in Nebraska and the 42nd most populous city in the nation.

The City of Omaha was founded in 1854 following the Kansas-Nebraska Act and a treaty with the native Omaha Tribe. Omaha remained the state's capitol until later moved to the City of Lincoln. During the 1860's Omaha became a rail hub later developing into a gateway to the west by the 1870's. Though Omaha struggled with corruption during the early 20th century, the city emerged as a vital center for meatpacking by the 1930s and 1940s. Omaha has hosted the College World Series since the 1950s. This was held at the Rosenblatt Stadium until 2011, when was moved to the newly-built TD Ameritrade Park. The Omaha riverfront and downtown area have grown

extensively in recent years, heavily anchored by CenturyLink Center Omaha and TD Ameritrade Park. While Omaha benefits from a diverse economy, its mostly highly-concentrated industry by employment is healthcare services, financial, trade, transportation and utilities.

Omaha utilizes a Mayor-Council form of government. In addition to the Mayor, seven officials comprise the legislative city council. Each of these elective representatives serves a four-year term. The city council possesses both legislative and executive authority, appoints officials, approves mayoral nominations and exercises control over the city budget. The Mayor appoints department directors and manages city functions. The city council makes policy changes, approves contracts and expenditures, and sets the annual property tax rate.

Sarpy County

Sarpy County covers over 238 square miles of land in central-eastern Nebraska adjacent to the Nebraska-Iowa border. Two US highways and one interstate highway run through the county and connect it with bordering counties. The county is located south of Omaha, bordered by Saunders County on the west, Cass County to the south, and Mills County, Iowa to the east. The largest city within the county is Bellevue and the county seat is Papillion.

Sarpy County was one of the last organized counties in Nebraska even though it was one of the oldest settlements in the state. In 1857 it was named after Peter Sarpy, a fur trader and key player in the economic establishment of the region. The county would go on to benefit from the 20th century presence of both the rail and military industries. These two economic drivers helped to dictate both the types of businesses and the types of people that make up the county today. Offutt AFB is currently the top employer in the county, but the education and service industries also play a large role in its regional economy.

The Sarpy County Board is tasked with oversight authority for the county. The board oversees county funds, business, and infrastructure. It also has the power to collect taxes, manage county real estate, and operate judicial buildings. The board consists of one elected representative from each of the five county districts, each of whom serves four-year terms. The Board Chairman is elected by the board every year and his / her duties include setting the weekly agenda, presiding over Board meetings, and appointing liaisons from the Board to various committees.

City of Bellevue

The City of Bellevue is located in Sarpy County in east-central Nebraska. It is approximately 10 miles southeast of Omaha and best accessible via US Highway 75. It is the largest city in Sarpy County in terms of population, with an estimated population of 53,663 in 2013.

The site was originally settled in 1822, when Joshua Pilcher, then president of the St. Louis-based Missouri Fur Company, built a fur trading post in what would later become Bellevue. As more settlers made their way to eastern Nebraska in the 1850s, the town experienced a building boom and a more diverse economy. However, Omaha's superior growth to the north caused minimal growth in Bellevue's population from the late 1800s to 1940. Fort Crook provided the first military presence in the area in the 1890s and was later redesigned as Offutt Air Force Base. This installation proved vital to the area during and after World War II, as Bellevue's population increased by over 18,000 people from 1940 to 1970. From 2000 to 2010, Bellevue saw a significant population increase, which is expected to continue for the foreseeable future. The increase of 13% over this decade, while considerably less than that of Sarpy County as a whole, is almost double that of the increase for the state of Nebraska. Aside from the large military industry influence, the city benefits from high quality infrastructure, a strong retail and service industry and a growing healthcare industry.

Bellevue, classified as a city of the first class by Nebraska Statute, comprises five wards. The governing body is composed of a mayor and six city council members, including a representative of each ward and an at-large elected member serving four year terms. The city council possesses both legislative and executive authority, appoints officials, approves mayoral nominations and exercises control over the city budget. The Mayor's duties include setting the weekly agenda, presiding over Board meetings, and appointing liaisons from the Board to various committees.

City of La Vista

The City of La Vista is located in Sarpy County, situated roughly 7 miles west of the Nebraska-Iowa border. It is approximately 6.5 miles southwest of Central Omaha. It is one of the fastest growing cities in Nebraska, with an

increase in population of 34.7 percent between 2000 and 2010 totalling 15,758 people.

La Vista was incorporated in 1960 in response to planned developments that aimed to provide affordable housing to working people in the area. While the village encountered financial problems and drought in the 1960's, it has been steadily growing over the last four decades. The municipality has been successful in utilizing public funding options to improve infrastructure and public services through a variety of bonds and sales tax initiatives. Its future vision has attracted an array of businesses and commercial development to accompany its booming population. Today, the city is a rapidly growing community and becoming a more integral part of the progression of the Omaha metropolitan area.

La Vista utilizes a Mayor-Council form of government. The mayor, elected at-large to a four-year term, serves as the lead decision-maker. The city council, consisting of an elected member from each of the city's four wards, also serves four year terms. The mayor, with City council approval, appoints a city administrator to carry out the day-to-day tasks of the city government.

City of Papillion

The City of Papillion is located in Sarpy County, situated roughly 10 miles west of the Nebraska-Iowa border. It is less than 10 miles southwest of Omaha. The 2010 population of the city was approximately 18,894, a 15.5 percent increase from the population taken during the 2000 census.

The Union Pacific Railroad's arrival in Nebraska in 1866 brought with it a need for a permanent settlement. While it took over 15 years, the City of Papillion was incorporated in 1883. Its name was taken from that of a nearby creek which was known by fur traders for its abundance of butterflies. The city remained primarily rural until post-war sprawl brought rapid growth in the 1940s and 1950s. The presence of Offutt AFB and the increasing growth of Omaha transformed the city into a booming suburb oriented around residential subdivisions. The city is currently on this same track of sprawling growth built around single-family homes and commercial development.

Papillion utilizes a mayor-Council form of government. The mayor is elected at-large and serves a four year term. The city council consists of two elected members from each of the city's four wards. The four-year terms are staggered; meaning that one seat in each ward is open for election

biannually. The mayor is the lead decision-maker for all city offices and affairs, including veto power. The mayor provides his/her recommendations to the city council, which handles the legislative branch of the city government. The council handles the operation of business, public health and safety, tax assessment, and fund appropriation. The city council elects one member as a president to preside at meetings in the absence of the mayor.

Mills County

Mills County covers over 437 square miles of land adjacent to the Nebraska-Iowa border in south-western Iowa. Three US highways and one interstate highway run through the county and connect it with four other bordering counties. Mills County is bordered by Pottawattamie County to the north, Cass County to the west, Fremont County to the south, and Montgomery County to the east. The largest city and county seat of the county is the City of Glenwood.

The county was established in 1851 and bears the name of Frederick Mills, an officer who fought and died in the Mexican-American War. The City of Tabor, a portion of which is in Mills County, is home to a former station of the Underground Railroad as well as the home where abolitionist John Brown once sought refuge. While late 19th century railroad construction passed through the county, it failed to make a significant economic impact due to a lack of stations within Mills County. Population growth over the 20th and 21st centuries has provided an increasing urban element to the county, but its economy still remains heavily influenced by the agriculture industry. Education and public health provide a significant share of employment within the county.

The Mills County Board of Supervisors is the lead legislative decision-making group in the county. It consists of three at-large members, each of whom serves four-year terms. The board approves bonds and reports, manages public infrastructure, levies taxes, and manages the overall administration of the county government.

City of Glenwood

The City of Glenwood is located in Mills County, Iowa, roughly seven miles east of the Nebraska-Iowa border. It is the most populous city and the county seat of Mills County.

Glenwood was originally known as Coonsville when Mormons first settled in the area in 1848. After the majority of them left for Utah in 1852, it took its current name of Glenwood and became a participant in the creation of the Iowa Territory. In the late 1800s, the town benefitted from the rail industry and became the state's hub for fruit production. Glenwood has relied heavily on the agriculture industry and related businesses for the last century. The Glenwood Resource Center is one of the largest employers in the city, providing evaluation and treatment for patients across the county. The city has a lively center square built around the Mills County Courthouse.

Glenwood operates under a Mayor-Council form of government. The mayor is elected at-large and serves a two year term. The city council consists of five elected members: one from each of the city's three wards and two at-large members. The mayor is the lead decision-maker for all city offices and affairs, including veto power. The mayor provides his/her recommendations to the city council, which handles the legislative branch of the city government. The mayor is the key decision-maker for the city through his/her executive power in the municipality. The city council, in addition to aiding in the decision making process, handles the administration and operation of government matters.

Pottawattamie County

Pottawattamie County covers over 950 square miles of land adjacent to the Nebraska-Iowa border in south-western Iowa. There are numerous highways that pass through Pottawattamie County such as I-80, I-29, and US Highways 6 and 59 that allow for people, goods, and services to travel through the county with ease. The most populous city and county seat of Pottawattamie County is the City of Council Bluffs.

The county was established in 1847 with its name paying homage to the Native American tribe that originally settled in the region. Early economic drivers for the county were based primarily on crops, with rich soils; because of this, many settlers became successful grain farmers. Many ancient and prehistoric species once occupied the ecologically diverse land known as the Loess Hills on the western part of the county. Today the county provides residents with an array of public services such as parks and trails. The county is also home to Iowa Western Community College and a number of K-12 schools. Their economy, while largely driven by agriculture, also accommodates large businesses and warehousing within the county.

Pottawattamie County Board of Supervisors are tasked with managing virtually every section of the county government. Each of the elected five members of the board serves four-year terms. The board handles the county budget, manages taxes, establishes policies, approves licenses, and handles a variety of other social and economic operations.

City of Council Bluffs

The City of Council Bluffs is located in south-western Iowa, situated along the Nebraska-Iowa border across the Missouri River from Omaha. It is Pottawattamie County's most populous city and county seat.

The city is named after Council Bluff, the campsite named by Lewis and Clark during their historic meeting with the Otoe and Missouri Indians. In the mid-1800s, tens of thousands of Mormons settled in the region on their way to Utah. The businesses set up in those decades profited when the 1849 gold rush brought more westward travellers through the region. In 1867, Council Bluffs became the eastern terminus for the transcontinental railroad. The city's major role in the railroad industry enabled it to serve as a regional economic center. Today, Council Bluffs' major industries are manufacturing, transportation, and packaging.

Council Bluffs operates under a Mayor-Council form of government. The mayor is elected at-large and serves a four-year term. The city council consists of five at-large members. The three councilmembers who receive the highest number of votes serve four-year terms, while the remaining two serve for two years. The mayor is responsible for the coordination and supervision of all city departments. He/she presides over all council meetings and gives general direction and policy guidance. The city council has legislative power throughout the city to adopt the budget, manage municipal finances, create ordinances, and adopt subcommittees.

2.3 JLUS Study Area Growth Trends

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

Population

Population data is based on the 2010 data provided by the US Census. Population numbers show the growth or decline in people in a geographical area. Population is a major factor for the economy of the Study Area and ultimately supports the employment and housing opportunities. The following information provides a comparison of the changes in population in the Offutt AFB JLUS Study Area from 2000 to 2010.

The population figures represent the permanent population in the Study Area, but do not consider the temporary population surges associated with the tourism industry and migration from seasonal employment or transient workers in the Omaha metropolitan region. Table 2-1 shows the 2000 and 2010 census totals and percent change in populations of jurisdictions within the JLUS Study Area.

Table 2-1. JLUS Study Area Population Trends, 2000-2010

Jurisdiction	2000	2010	Number Change	Percent Change
Nebraska	**1,711,263**	**1,826,341**	**115,078**	**6.7%**
Cass County	24,334	25,241	907	3.7%
City of Plattsmouth	6,887	6,502	-385	-5.6%
Douglas County	463,585	517,110	53,525	11.6%
City of Omaha	390,007	408,958	18,951	4.9%
Sarpy County	122,595	158,850	36,255	29.6%
City of Bellevue	44,382	50,137	5,755	13.00%
City of La Vista	11,699	15,758	4,059	34.7%
City of Papillion	16,363	18,894	2,531	15.5%
Iowa	**2,925,324**	**3,046,355**	**121,031**	**4.1%**
Mills County	14,547	15,059	512	3.5%
City of Glenwood	5,358	5,269	-89	-1.7%
Pottawattamie County	87,704	93,158	5,454	6.2%
City of Council Bluffs	58,268	62,230	3,962	6.8%

Sources: 2000 and 2010 US Census Bureau data

Almost all jurisdictions within the JLUS Study Area saw an increase in their population levels due to the changes in once heavily agricultural land into extensions of the Omaha metropolitan region. The region's high quality of life, low cost of living, pro-business environment and provision of public services has helped to drive this population increase.

Sarpy and Douglas counties saw the largest growth between 2000 and 2010, increasing by 29.6 percent and 11.6 percent, respectively. The completion of Highway 75 was a major contributor to this increase along with other access improvements to the counties. As indicated by the population figures in Table 2-1, only two communities in the Study Area saw a decline in population between the years of 2000 to 2010 – the City of Plattsmouth in Nebraska, and the City of Glenwood in Iowa. These experiences are usually due to out-migration, which occurs when populations move out of an area because of either a lack of available housing or job opportunities. Within the State of Iowa, Pottawattamie County saw the largest increase with a population change of 6.2 percent from 2000 to 2010. The City of Council Bluffs followed with an increase of 6.8 percent. Both jurisdictions growth rates are higher than that of the state, indicating that development pressures will continue to be seen in these areas.

Figure 2-1 illustrates the population densities in the JLUS Study Area in 2000 and Figure 2-2 shows the change in densities in 2010. These figures are both presented to show the growth and density of areas within the JLUS Study Area. A comparison of the two maps shows that the Omaha metropolitan area is growing and is seeing increased density and growth south of the city, towards Offutt AFB. If this trend continues consistently for the next several decades, then there will be more people living closer to Offutt AFB and there will be a bigger change of incompatible development near the base.

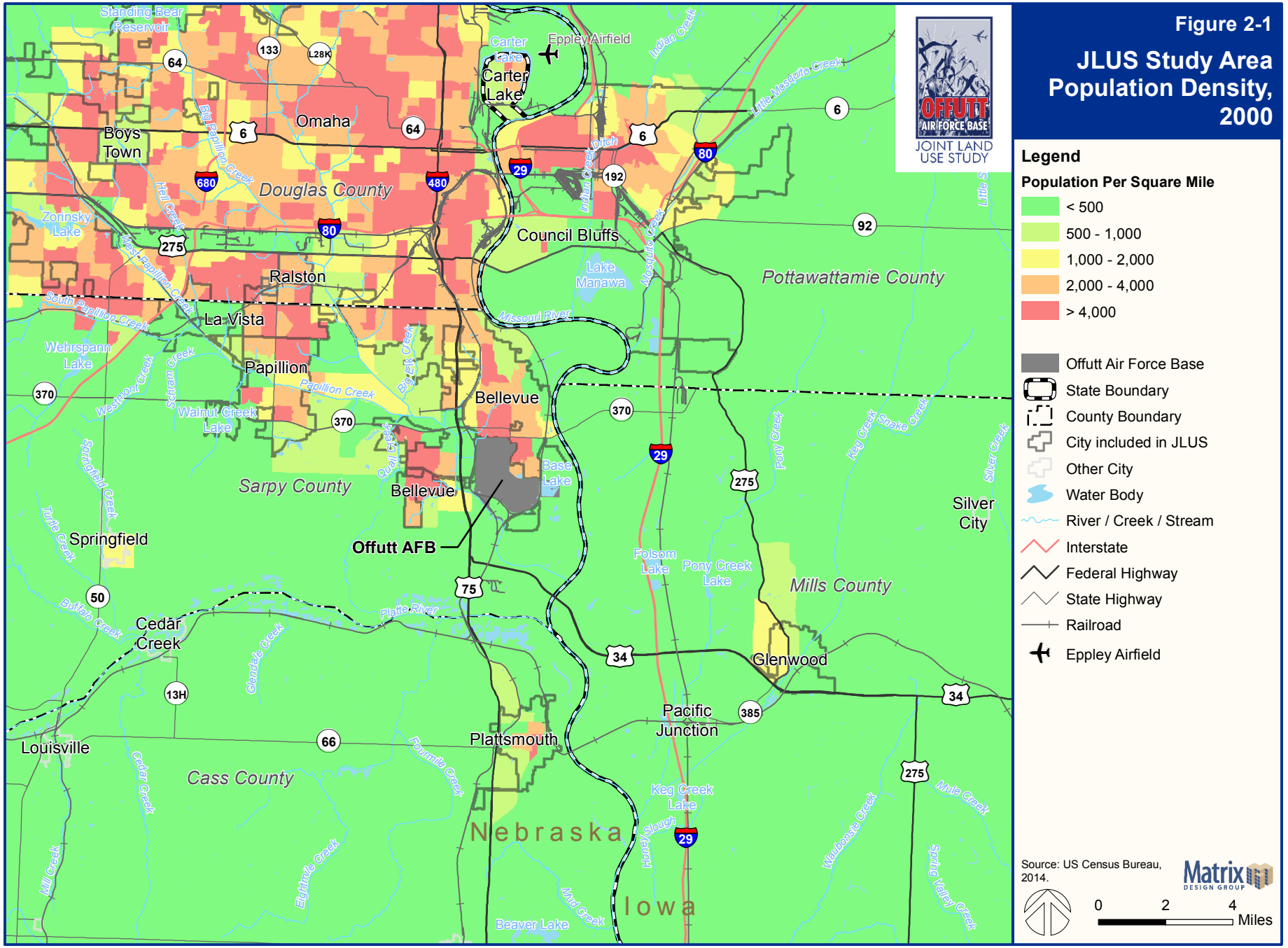
Figure 2-1
JLUS Study Area Population Density, 2000
Legend
Population Per Square Mile
< 500
500 - 1,000
1,000 - 2,000
2,000 - 4,000
> 4,000
Offutt Air Force Base
State Boundary
County Boundary
City included in JLUS
Other City
Water Body
River / Creek / Stream
Interstate
Federal Highway
State Highway
Railroad
Eppley Airfield
Source: US Census Bureau, 2014.
0 2 4 Miles
Omaha
Boys Town
Carter Lake
Eppley Airfield
Council Bullfs
Douglas County
Pottawattamie County
Ralston
La Vista
Papillion
Bellevue
Sarpy County
Offutt AFB
Springfield
Silver City
Mills County
Glenwood
Pacific Junction
Plattsmouth
Cass County
Louisville
Cedar Creek
Nebraska
Iowa
Zorinsky Lake
Wehrspann Lake
Walnut Creek Lake
Lake Manawa
Base Lake
Folsom Lake
Pony Creek Lake
Keg Creek Lake
Beaver Lake
Standing Bear Reservoir
Missouri River
Platte River
Papillion Creek
Big Papillion Creek
South Papillion Creek
Little Papillion Creek
Big Elk Creek
Quail Creek
Indian Creek
Mosquito Creek
Little Mosquito Creek
Pony Creek
Keg Creek
Snake Creek
Silver Creek
Springfield Creek
Turtle Creek
Buffalo Creek
Glendale Creek
Fourmile Creek
Eightmile Creek
Mill Creek
Cedar Creek
Honey Slough
Weubonsie Creek
Spring Valley Creek
Mule Creek
Mud Creek
Hell Creek
Schram Creek
Westmont Creek

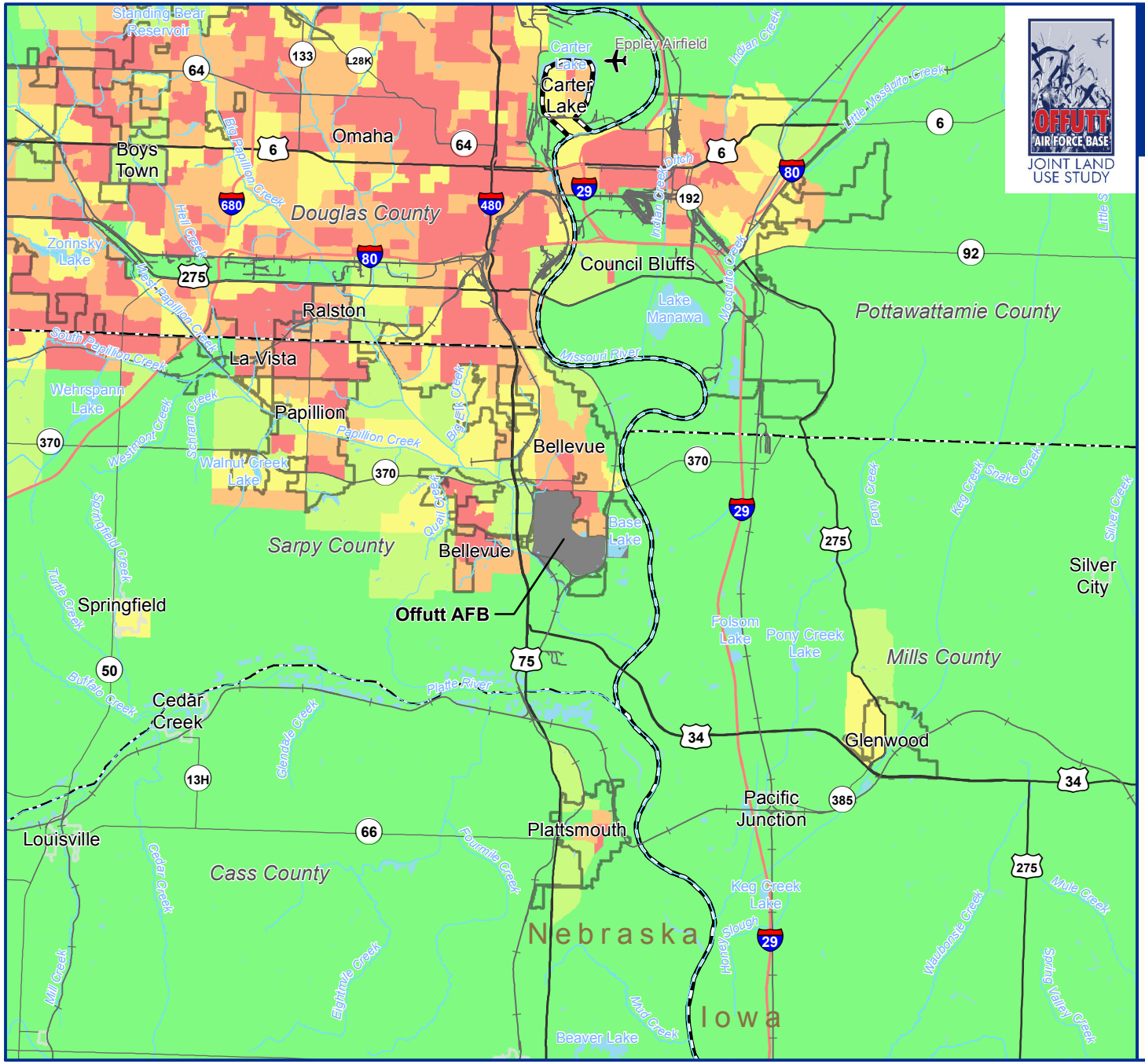

Figure 2-2

JLUS Study Area Population Density, 2010

Legend

Population Per Square Mile

- < 500
- 500 - 1,000
- 1,000 - 2,000
- 2,000 - 4,000
- > 4,000

- Offutt Air Force Base
- State Boundary
- County Boundary
- City included in JLUS
- Other City
- Water Body
- River / Creek / Stream
- Interstate
- Federal Highway
- State Highway
- Railroad
- Eppley Airfield

Source: US Census Bureau, 2014.

0 2 4 Miles

Future Population Projections

Population projections for Nebraska and Iowa, including some of the JLUS Study Area jurisdictions are prepared by the US Census, information is not available for certain jurisdictions. Table 2-2 shows the population projections for the JLUS communities. Douglas County had the highest population in 2010, with 517,110 people, and is projected to increase by 18.5 percent by the year 2030. As Douglas County continues to increase, residents are moving outward into Sarpy County. As the two counties continue to show strong population growth, bordering jurisdictions such as Cass County will experience a similar increase in populations.

Pottawattamie County, Iowa, is expected to have an increase in population of nearly six percent between 2020 to 2030, which is nearly the same percentage increase experienced from 2000 to 2010. Mills County population increase from the year 2020 to 2030 is almost double that as seen from 2000 to 2010.

These projected populations are not expected to be exact; however, they are estimated to help cities and counties to develop land use priorities to reduce impacts of future growth challenges.

Table 2-2. JLUS Study Area Population Projections from 2020 to 2030

Jurisdiction	2020	2030	Number Change	Percent Change
Nebraska	**1,949,114**	**2,054,752**	**105,638**	**5.4%**
Cass County	32,600	38,381	5,781	17.3%
City of Plattsmouth	N/A	N/A	N/A	N/A
Douglas County	562,813	613,149	50,336	8.9%
City of Omaha	459,938	485,279	25,341	5.5%
Sarpy County	191,540	224,709	33,169	17.3%
City of Bellevue	N/A	N/A	N/A	N/A
City of La Vista	N/A	N/A	N/A	N/A
City of Papillion	N/A	N/A	N/A	N/A
Iowa	**3,020,496**	**2,955,172**	**-65,324**	**-2.2%**
Mills County	18,100	19,879	1,779	9.8%
City of Glenwood	N/A	N/A	N/A	N/A
Pottawattamie County	97,943	103,872	5,929	6.1%
City of Council Bluffs	N/A	N/A	N/A	N/A

Source: US Census Bureau; University of Nebraska-Lincoln Bureau of Business Research; and Iowa State Data Center

Housing Trends

Housing trends indicate economic activity and vitality in an area through the representation of population growth. In slower-growing areas, housing data may reveal abandonment or migration. These trends also represent market decisions relating to home ownership or rental properties. The rate of housing development is a strong indicator of the overall rate of development taking place in a region, which may result in potential incompatible land uses in conjunction with operations at Offutt AFB. Essentially, housing trends have the potential to indicate future types of residential and commercial development. The following information portrays housing market trends, median monthly gross rents, percentage of basic allowance for housing (BAH) and median home values within the JLUS Study Area.

The BAH is a stipend given to military personnel who choose to live off Base or cannot be accommodated in on-base housing and is designed to augment the costs of living associated with private sector housing including home or apartment rent, utilities, and renter's insurance.

From 2000 to 2010, the median gross housing units for the Study Area jurisdictions within Nebraska result to 10.43 percent, and 7.77 percent for Iowa's jurisdictions.

Table 2-3. JLUS Study Area Housing Unit Trends, 2000-2010

Jurisdiction	2000	2010	Number Change	Percent Change
Nebraska	**722,668**	**796,793**	**74,125**	**9.3%**
Cass County	10,179	11,117	938	8.4%
City of Plattsmouth	2,805	2,863	58	2.0%
Douglas County	196,672	219,580	22,908	10.4%
City of Omaha	165,731	177,518	11,787	6.6%
Sarpy County	44,981	61,938	16,957	27.4%
City of Bellevue	17,439	20,591	3,152	15.3%
City of La Vista	4,511	6,670	2,159	32.4%
City of Papillion	5,751	7,240	1,489	20.6%
Iowa	**1,232,511**	**1,336,417**	**103,906**	**7.8%**
Mills County	5,671	6,109	438	7.2%
City of Glenwood	1,946	2,045	99	4.8%
Pottawattamie County	35,761	39,330	3,569	9.1%
City of Council Bluffs	24,340	26,594	2,254	8.5%

Sources: 2000 and 2010 US Census Data

Table 2-3 shows an increase in housing units in each jurisdiction within the JLUS Study Area. The areas with the highest change in units are the jurisdictions within Sarpy County. The increase in attractiveness of the area as a suburban extension of the Omaha metropolitan region is causing large increases in both population and new housing development.

Housing in Sarpy County

Residents within the City of Omaha experience relatively low housing prices, with the cost of living 6.5 percent lower than the national average. With averages this low, military personnel may choose to live further away from Offutt AFB, which may increase commuter times. Douglas County metro areas continue to expand and demands in different markets throughout the county are causing for an increase in lot acreage.

Even though Iowa's cost of living is relatively more than Nebraska, the two states have been rated by sources such as *Forbes Magazine* and *USA Today* as among the least expensive states to live in. Nebraska is experiencing a higher percentage of migration into urban and metro centers, along with higher agricultural land values. As industrial and commercial industries continue to grow, so will the need for new neighborhoods.

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

Table 2-4 shows the change in median monthly rents for communities in the JLUS Study Area from 2000 to 2010.During this timeframe, the median monthly rent increased by a range of roughly 26 to 46 percent among the Study Area jurisdictions. In the 10 year span, Mills County experienced the greatest increase in median monthly rent, with a 45.6 percent increase, while the cities of Council Bluffs and Plattsmouth saw the lowest increases, with an approximately 26 percent increase, both lower than their respective state averages.

Table 2-4. JLUS Study Area Median Monthly Rents, 2000-2010

Jurisdiction	2000	2010	Number Change	Percent Change
Nebraska	**$491**	**$648**	**$157**	**32.0%**
Cass County	$502	$662	$160	31.9%
City of Plattsmouth	$499	$631	$132	26.5%
Douglas County	$541	$725	$184	34.0%
City of Omaha	$537	$712	$175	32.6%
Sarpy County	$607	$813	$206	33.9%
City of Bellevue	$581	$757	$176	30.3%
City of La Vista	$646	$830	$184	28.5%
City of Papillion	$622	$832	$210	33.8%
Iowa	**$470**	**$617**	**$147**	**31.3%**
Mills County	$465	$677	$212	45.6%
City of Glenwood	$462	$632	$170	36.8%
Pottawattamie County	$537	$689	$152	28.3%
City of Council Bluffs	$550	$694	$144	26.2%

Source: US Census Bureau, Median Gross Rent (Dollars) 2000, 2010

Housing Value Trends

Housing value trends assist in illustrating the changes in land and home values relative to market fluctuations. These fluctuations can be indicative of development activity or inactivity as well as the location or migration patterns of populations. Table 2-5 provides the median housing value trends in the Study Area from 2000 to 2010.

Table 2-5. JLUS Study Area Median Housing Value, 2000-2010

Jurisdiction	2000	2010	Number Change	Percent Change
Nebraska	**$86,900**	**$123,900**	**$37,000**	**42.6%**
Cass County	$96,000	$142,800	$46,800	48.8%
City of Plattsmouth	$81,000	$101,600	$20,600	25.4%
Douglas County	$99,600	$141,400	$41,800	42.0%
City of Omaha	$93,300	$131,900	$38,600	41.8%
Sarpy County	$112,000	$158,600	$46,600	41.6%
City of Bellevue	$96,900	$137,800	$40,900	42.2%
City of La Vista	$92,900	$143,700	$50,800	54.7%
City of Papillion	$126,600	$163,800	$37,200	29.4%
Iowa	**$82,100**	**$119,200**	**$37,100**	**45.2%**
Mills County	$95,200	$144,200	$49,000	51.5%
City of Glenwood	$92,800	$131,100	$38,300	41.3%
Pottawattamie County	$84,800	$126,100	$41,300	48..7%
City of Council Bluffs	$76,500	$110,500	$34,000	44.4%

Source: US Census Bureau, Median Gross Housing Value (Dollars) 2000, 2010

Median housing values have experienced substantial growth throughout the JLUS Study Area. These increasing values translate into higher rents and mortgages as well as an increase in the cost of living for area residents. Greater housing values cause a challenge to the affordability of housing near Offutt AFB, especially due to the increases seen in the cities of Bellevue and Omaha and can result in military personnel pursuing home ownership to locate further from Offutt AFB. A portion of the financial cost saved from locating further from the Base is offset by the time and cost of greater commuting distances.

2.4 Economic Baseline

The primary economic activity throughout the Study Area is centered on the agriculture industry dating back to the early colonial period. Efforts to diversify Omaha's and Bellevue's economy with new sectors have brought substantial growth to the region and the counties of Douglas and Sarpy in the insurance, healthcare, and retail trade industries. These now represent the largest industries in the county, in addition to hospitality and food services.

Nebraska

Nebraska is a leading producer for numerous industries such as agricultural, manufacturing, mining, and private services which include law, healthcare, data processing, and financial companies. Known for their livestock, corn, soybeans, and wheat, the state is ranked fourth for its agricultural output. Manufacturing of chemicals puts Nebraska second on the list and one of the world's main food processing states. Private services such as health care, data processing, and law have also become a major contributor to the state's economy, with wholesale trade and finance coming in second, and government services and transportation third.

Source: http://www.netstate.com/economy/ne_economy.htm

Cass County

With agriculture a large portion of the economy, many residents that work in non-related fields have to commute to other counties for work. In the year 2000, the Cass County Nebraska Economic Development Council (CNEDC) was established and by 2008 they joined the Greater Omaha Economic Development Partnership (GOEDP). Some of the top employment sectors for the county in the year 2010 include government, transportation, hospitality services, manufacturing, and education and health services. According to the Bureau of Labor Statistics local government jobs had the highest employment increase from 2000 to 2010, with over 1,224 employed in 2010.

Source: http://www.selectgreateromaha.com/Omaha/media/docs/About%20Us/Plattsmouth%20Trend%20Study%202014.pdf

City of Plattsmouth

According to Plattsmouth's Comprehensive Plan, the city's economic growth was greatly influenced by Omaha's metro area throughout the 1900s. From the 2000 census the top employment occupations consisted of management, sales, along with educational, health and social services. Additionally, 60 percent of Plattsmouth's citizens are employed in Cass, Sarpy and Douglas County.

Douglas County

According to the Bureau of Business Research Department of Economics, Douglas County is expected to experience strong employment growth in the industrial, and service sectors. In the year 2000, Douglas County estimated an average of 90 percent of the residents living within the county also worked there. With the continued expansion of Omaha, Douglas and Sarpy Counties should expect rapid growth in their economies. Douglas County's employment growth will allow for an increase in commercial and industrial space to provide more opportunities in retail, and service industries.

City of Omaha

In the early 1990's Omaha saw an increase in workers within the city and a decrease within the surrounding counties such as Sarpy, Saunders, Dodge, and Washington. With residents flocking to Omaha for work the city saw the need to expand its employment options to preserve its economy. The City of Omaha has been undergoing continued improvements within its boundaries and to support these efforts the city has developed five programs to improve its economic sector. These programs include a Tax Increment Financing (TIF), site acquisition, preparation and conveyance, construction of commercial and industrial properties, micro-enterprise business development, and the Omaha small business network technical assistance. The City of Omaha has implemented these programs as tools for revitalization, so that redevelopment can be feasible for the city without competition.

Omaha has undergone a variety of development projects involving business-government partnerships; with a $12.8 billion dollar investment and $2 billion in downtown redevelopment since 2004. Rated by Forbes as one of the top 25 places for business and careers, Omaha's diverse economy allows it to support a variety of industries increasing job growth by 1.4 percent each year.

Omaha's current employment concentration includes retail, health care, transportation and warehousing, finance and business services, and service industries. Manufacturing, insurance, Offutt AFB, and transportation are the four key industries that provide jobs and support for the Omaha region. Top business sectors include, the Fortune 500 headquarters, First National Bank of Nebraska, and the Union Pacific and Werner Enterprises transportation and distribution companies. Omaha is home to 10 fortune 1000 companies and the largest privately held bank in the nation. Major employers for the city include Alegent Health, Methodist Health System, First Data, Union Pacific, First National Bank, and Mutual of Omaha.

In 2005, manufacturing had become a key contributor to the economy averaging 33,900 jobs within the metro area. Finance and business sectors are another major contributor, accounting for over 31,200 jobs, and will continue to be a major influence on the local economy. From the beginning of Omaha's establishment the rail line has continued to be the leading provider for the area's economy. Not only has transportation been a factor in Omaha's recent increase in growth, but more so the trucking industry. With access to east and west I-80 and north and south I-29, major truck companies see the city as a central location. These influences will enhance Omaha's future population, employment and housing.

Source: http://www.selectgreateromaha.com/Site-Selection-Data-Economy.aspx

Sarpy County

In 1976, the Sarpy County Economic Development Corporation (SCEDC) was founded to expand and develop the industrial and service sectors by expanding employment opportunities by joining the GOEDP.

Sarpy County has seen an overall increase in non-farm employment, including manufacturing and services, and construction. While Sarpy County's growth has been spurred by the larger Omaha regional market, it has also grown in its own right with many industries, especially Offutt AFB. The location of Claas Omaha Inc., a PayPal branch office, and SAC Federal Credit Union branches in Sarpy County also contribute to the employment base of the county. Continued growth in Douglas County will soon spill into Sarpy County, and by the year 2050, according to the GOEDP, employment estimates are forecasted at 105,000 jobs in the service sector, and 10,000 in transportation and construction.

City of Bellevue

Due to the development of the Kennedy Freeway in the City of Bellevue, commercial, industrial and residential areas are continuing to increase rapidly, expanding the employment sector. With the average household income five percent higher than the states average, the city provides its

residents with a low cost of living, therefore resulting in very low unemployment.

Another major economic contributor for the city is Offutt AFB, the area's largest employer, with an economic impact of an average of $1.6 billion. The city's dependable telecommunications systems along with urbanized infrastructure has allowed for its communities to grow and support the retail and social service industries.

City of La Vista

La Vista has been able to develop a community that citizens want to live and work in, and future plans for the community include improving business development to allow for more employment opportunities within its boundaries. Recent studies have shown that the finance, sales and administrative support industries have increased within the City of La Vista. With an extensive transportation network and affordable utilities, the city is able to attract new businesses through these incentives.

City of Papillion

The City of Papillion is also included in with the Omaha metropolitan area, resulting in many of the residents working within Omaha and at Offutt AFB. Civilians are more likely to be employed in a health services, education, and public administration jobs rather than manufacturing or construction professions.

Iowa

Over the years Iowa's economic structure has become more diverse, developing strong employment in agricultural production and manufacturing services. Top employment sectors include health care, business, financial, and consumer services. Iowa's housing trends are anticipated to increase through the population's growth. Due to the different levels of urbanization within the jurisdictions of Mills County, Pottawattamie County, and the Cities of Glenwood and Council Bluffs, the annual job growth rate is at an average of 1.2 percent. In 2000, 10 percent of Iowa county residents were commuting as far as Omaha for work; this average has decreased, reflecting stronger job growth within the area.

In the year 2007, Iowa ranked in the top three as a producer of corn, soybeans, hog, and other annual productions. Earning 4.8 percent from just farm production makes the state dependent on these earnings eight times more than the national average. Since 2008, Iowa has experienced a decline in the number of farmers. This decline is steady but slow, representing an out-migration of farmers.

Pottawattamie County

For Pottawattamie County, many of their residents depend on Douglas County, and the City of Omaha for work. Agriculture has also been a primary factor in the county's economy, but the number of non-farm employees has increased since 1992 according to Pottawattamie's comprehensive plan. Future commercial and industrial areas are expected to grow as the population of Council Bluffs increases.

In 2014, Pottawattamie County established the Advance Southwest Iowa Corporation, which has joined with the Greater Omaha Economic Development Partnership in hopes to attract new business and new jobs.

Council Bluffs

The beginning economy of Council Bluffs depended on agriculture and small businesses for stability. After the development of the railroad, river port, and highway systems, Council Bluffs developed its economy into a trading center for both agricultural and non-agricultural industries. Health services, retail, and food services are top employment industries for the city. Emerging industries such as ethanol production facilities and data centers have quickly become an important economic factor for the region. With the Southwest Iowa Renewable Energy facility and the $1.5 billion Google data center located within Council Bluffs, it is expected that these fields will continue to increase the city's economy by attracting similar corporations.

Mills County

Agriculture is a major contributor to Mill County's economy and will continue to lead as the growth in Council Bluffs and Omaha metropolitan areas continue to increase. According to the general plan, educational, health and social services account for an average of 28.6 percent of the total population for the county, with retail trade coming in second at 10.3 percent. In comparison with the other incorporated Iowa Study Area jurisdictions, Mills County had the lowest unemployment rate in 2011 with a 4.4 percent according to Iowa's Workforce and Economic Development Regional Status Report.

Source: State of Iowa Consolidated Plan for Housing and Community Development, 2010; Workforce and Economic Development Regional Status Report, May 2012.

2.5 Current Development Overview within the Study Area

The variety of land uses are a result of influential factors such as roads, highways, commercial and industrial development, economic activities and more. With the expansion of US Highway 75 and the newly constructed US Highway 34 Bridge to the south of Offutt AFB, the communities within the JLUS Study Area will likely experience growth.

Development surrounding Offutt AFB is characterized by the following:

North

The City of Bellevue lies immediately to the north of Offutt AFB. The area has a combination of residential, industrial, and general business land uses. Areas to the northeast are zoned Accidental Potential Zone per the AICUZ Overlay District and subject to restriction of the APZ I and II regulations.

East

Directly east of Offutt AFB lies the Base Lake, a few miles more east is the Missouri River and the Iowa border. Mills County, Iowa lies just east of the installation.

South

The City of Plattsmouth lies immediately to the south of Offutt AFB. The Platte River runs west to east within this area before connecting with the Missouri River. US Highway 34 runs east to west crossing the Missouri River. The recent construction of a bridge for US Highway 34 has connected US Highway 75 in Sarpy County, NE to Interstate 29 in Mills County, IA.

West

The cities of Bellevue, Papillion, and La Vista lie to the west of Offutt AFB. US Highway 75 runs along the western side of Offutt AFB. To the west of the base proper is additional Air Force property, which includes Willow Lakes Golf Course, the Ehrling Bergquist Hospital Clinic, and privatized residential development. The majority of the land on the west side of Offutt AFB is residential, agricultural, vacant, or commercial.

Aerial view of Offutt AFB and surroundings, looking south

Transportation

The highway system in the Study Area is influenced by the rail line, Missouri River, and farmlands. The primary transportation corridors in the region are illustrated on Figure 2-3.

The local roadway system consists of highway expressways, prime arterials minor arterials, major and minor collectors, and residential streets. The intent of this local roadway system is to provide mobility and access to the various communities within the JLUS Study Area, and to connect them to other communities outside the Study Area. In addition, some of these roadways serve the counties residents and visitors by providing interstate and regional access. The following is a brief description of the major highways in the Study Area.

US Highway 75 runs to the west of Offutt AFB and gives access to the installation's main gate and secondary gate located on Fort Crook Road. Harlan Lewis Road sits on the east side of Offutt AFB and provides access to Base Lake, and serves as a connector from Old Town Bellevue to Highway 34.

I-80 is a transcontinental interstate highway that extends from San Francisco, California, to New Jersey, along the historic Oregon Trail. The interstate enters Nebraska from Wyoming heading east to the City of Council Bluffs, Iowa. Located north of Offutt AFB, I-80 gives access to US Highway 75 before heading southwest, running almost parallel with US Highway 75.

I-29 is a north to south interstate highway that runs parallel along the Missouri River. From Iowa, I-29 runs northwest through the cities of Omaha and Council Bluffs providing access to Offutt AFB in Bellevue. The interstate has become a major route for residents commuting from Council Bluffs to Omaha.

US Highway 34 runs from north-central Colorado to the western suburbs of Chicago, Illinois. The highway overlaps US Highway 6 in Hastings, Nebraska when traveling from Grand Island to Lincoln. US Highway 34 is mostly used for local traffic since I-80 has become a higher-speed corridor. The highway runs east to west just south of Offutt AFB, crossing I-29 from the east and over the Missouri River before connecting with US Highway 75.

Rail

Nebraska is known for its major transportation networks through major highways and rail lines. The two major rail services within Nebraska are Union Pacific (UP) Railroad, and the Burlington Northern Santa Fe (BNSF) Railway. These rail lines transport all the manufactured and agricultural products to the rest of the nation and played an important role in establishing the state to where it is today. UP Railroad covers a large portion of the central and western US, stretching from the Mississippi River and the City of Chicago to the Pacific Ocean and from Canada to Mexico. It runs east-west through Nebraska passing through cities including Omaha, Lincoln, Hastings, Grand Island, and North Platte. In Iowa, it travels both east-west and north-south, passing through cities including Sioux City, Des Moines, and Cedar Rapids. BNSF Railway has a similar system map to UP Railroad (from the Mississippi River and the City of Chicago to the Pacific Ocean and Canada to Mexico), but where UP serves more of the western central region, BNSF Railway serves more of the northern central region.

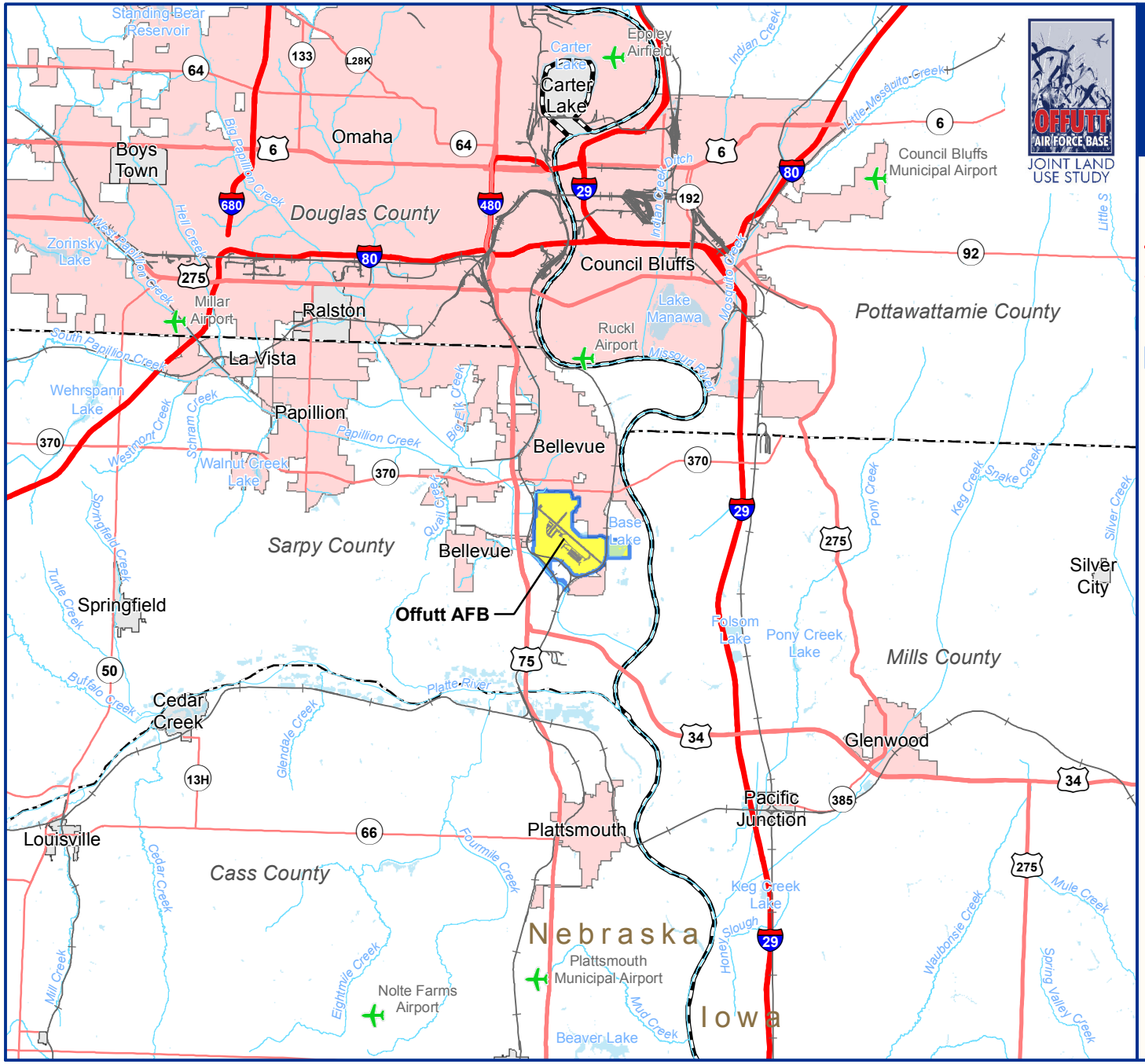

Figure 2-3

JLUS Study Area Transportation

Legend

- Airport
- Interstate
- Federal Highway
- State Highway
- Railroad
- Offutt Air Force Base
- State Boundary
- County Boundary
- City included in JLUS
- Other City
- Water Body
- River / Creek / Stream
- Airfield Surface / Runway

Sources: US Census Beauru, 2014; National Transportation Atlas, 2014.

Matrix Design Group

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Within Nebraska, BNSF Railway travels east-west and north-south, passing through cities including Omaha, Lincoln, Hastings, Grand Island, McCook, Scottsbluff, and Crawford. Within Iowa, the route is mainly east-west and the cities served include Des Moines, Creston, Bayard, and Sioux City.

BNSF Railway train traveling south through Omaha

Air Transportation

There are several airports within or adjacent to the JLUS Study Area. A study of local airports is important when considering the flight operations at Offutt AFB. The closest airport to Offutt AFB is the Ruckl Airport, located in Council Bluffs. There are several smaller airports located in the region. These are primarily private or general aviation airports and do not support larger commercial operations. A brief description of the airports within the region is provided below.

- Nolte Farms Airport – The Nolte Farms Airport is privately owned and is located in Cass County, west of Plattsmouth and Highway 75, approximately 18 miles from Offutt AFB. It covers 10 acres and has one runway measuring 2,300 feet long by 65 feet wide.
- Plattsmouth Municipal Airport – The public airport is located four miles southwest from Plattsmouth and approximately 13 miles from Offutt AFB. The airport consists of one runway measuring at 5,500 feet long and 100 feet wide.
- Millard Airport – Publicly owned by the Omaha Airport Authority, the 165-acre airport is located in Omaha, 16 miles from Offutt AFB. The single runway measurements are 3,801 feet long by 75 feet wide.
- Ruckl Airport – Located three miles southwest of Council Bluffs, the privately owned airport is approximately 12 miles from Offutt AFB. The Ruckl Airport has a single runway measuring 2,400 feet long by 120 feet wide.
- Council Bluffs Municipal Airport – Publicly-owned by the Council Bluffs Airport Authority, the 656-acre airport is located roughly four miles east of Council Bluffs' city center and approximately 21 miles northeast of Offutt AFB. The airport has two runways, one measuring 5,500 feet long by 100 feet wide, and the second 3,650 feet long by 60 feet wide. The airport provides service and facilities to private and charter jets. The airport also home to numerous flight schools and aviation training.
- Eppley Airfield – Eppley Airfield is located roughly four miles northeast of Central Omaha in Douglas County, 18 miles from Offutt AFB. The publicly-owned airport consists of 2,650 acres with three runways, the first measuring at 9,502 feet long by 150 feet wide, the second 8,500 feet long by 150 feet wide, and the third 8,154 feet long by 150 feet wide. Airlines that are serviced at the airport include Alaska, American, Delta Air, Frontier, Southwest, United and US Airways. With 16 non-stop cities and approximately 4.1 million passengers in 2014, it is Omaha's primary commercial airport.

Offutt AFB Profile 3.

JOINT LAND USE STUDY

Please see the next page.

Inside Chapter 3...

3.1 Introduction

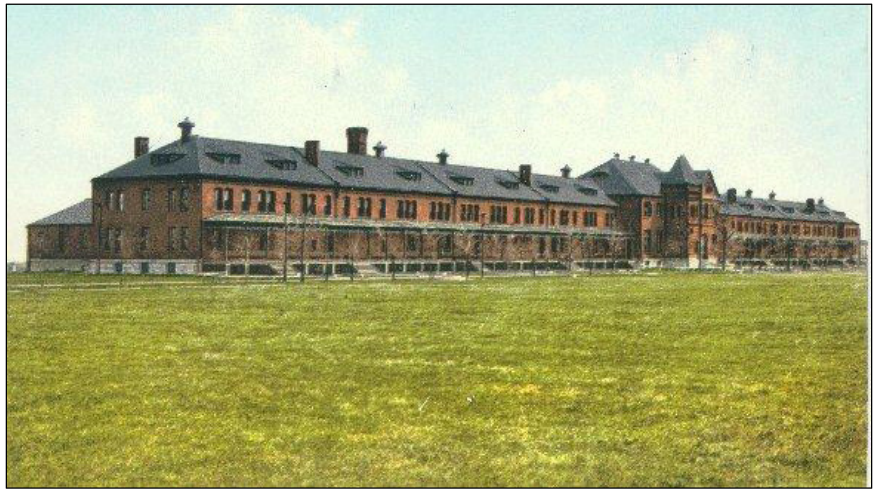
This chapter provides an overview of Offutt Air Force Base (AFB). This military profile describes the installation's history, its location (setting) in the JLUS Study Area, the economic and strategic importance of Offutt AFB, and a general description of the military operations conducted at Offutt AFB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

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

3.2 History of Offutt AFB

The original inhabitants of the JLUS Study Area were the Pawnee, Otoe, and Sioux Native American tribes. A year after Thomas Jefferson acquired the Louisiana Purchase in 1803, Lewis and Clark's expedition passed through the region and noted the potential for a trading outpost. It was not until the signing of the Kansas-Nebraska Act of 1854 that the Kansas and Nebraska territories were formally opened to development.

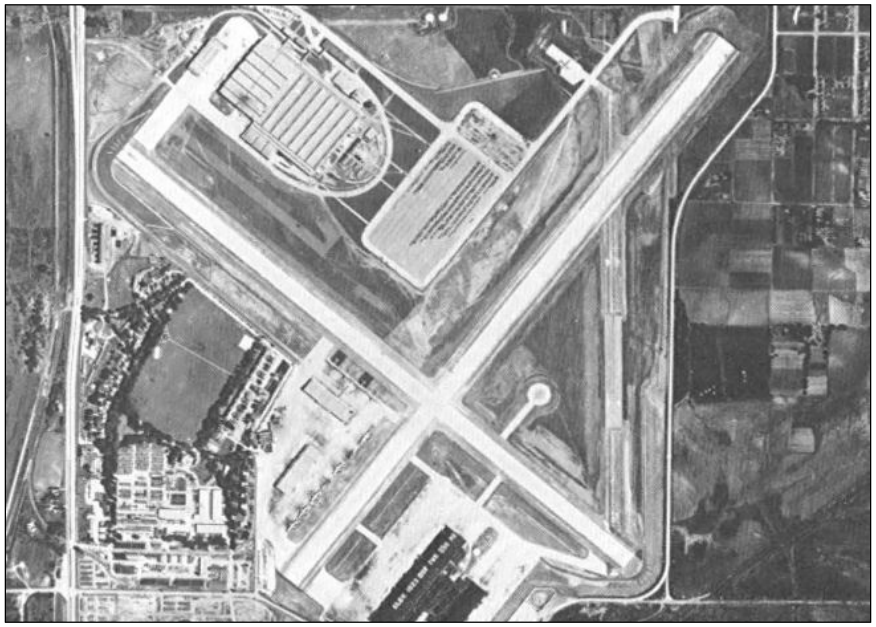
In 1894, Fort Crook was established and named after the Civil War hero Major General George Crook. Early operations at Fort Crook were centered around conflicts between settlers and Native Americans on the Great Plains. By 1918, the 61st Balloon Company became the first air unit at Fort Crook, establishing a runway for planes to land and refuel when engaging in cross-country flights. In 1921, Fort Crook made a bigger investment in the aviation capacity by creating an airfield to handle larger and more frequent aircraft operations.



Fort Crook Headquarters and Barracks Illustration

In 1924, the flying field was renamed as the Offutt Field, after 1st Lt. Jarvis Offutt, Omaha's first aviation casualty of World War I. In 1940 airfield capacity was expanded again to become the new bomber plant and included construction of two one-mile-long concrete runways, six hangars, and an assembly building comprising 1.2 million square feet.

By June of 1942, the plant started operations, producing 531 B-29 "Superfortresses" and 1,585 B-26 "Marauders" all before the end of World War II. The "Enola Gay" and "Bockscar", the B-29 bombers that dropped on Hiroshima and Nagasaki were produced during this time. Production of these bombers ended on September 8, 1945.



Offutt Field in the 1940s

Fort Crook was officially renamed Offutt Airfield in 1946, and in 1948, it was transferred to the Department of the Air Force and became Offutt Air Force Base. Later that same year, Offutt AFB became the host base for the Strategic Air Command (SAC).

During the Cold War, Offutt AFB became an operating base of alert bombers and tankers, offering support for intercontinental ballistic missile sites in Nebraska and Iowa, and became a worldwide strategic reconnaissance location. The establishment of the Joint Strategic Target Planning Staff in 1960, the "Looking Glass" airborne command post in 1961, the Air Force Global Weather Center in 1969, and the National Emergency Airborne Command Post in 1977, further expanded Offutt AFB's operations and importance into the 1980's.

When the Air Command was disestablished in 1992, the command was redesignated the United States Strategic Air Command (USSTRATCOM). The USSTRATCOM is crucial to Offutt AFB's and our nation's national security. The USSTRATCOM mission is to detect, deter, and prevent strategic attacks against the United States and our Allies.

Offutt AFB is the home of the 55th Wing and more than 50 partner units including the USSTRATCOM and the 557th Weather Wing. Offutt's diverse missions and global responsibility put it on the cutting edge of the Air Force's transformation. Approximately 10,000 military and federal employees are assigned here.

Source: United States Air Force Fact Sheet, History of Offutt Air Force Base, 2005

3.3 Offutt AFB Economic Benefit

The Offutt AFB JLUS Study Area encompasses communities in Nebraska and Iowa. The counties of Cass, Douglas, Sarpy, and the cities of Bellevue, Plattsmouth, La Vista, and Papillion are in Nebraska. Counties of Mills and Pottawattamie and the cities of Council Bluffs and Glenwood are in Iowa. The Department of Defense (DOD) is a significant component of the regional and local economies. Offutt AFB is a significant employer in the Study Area with 10,127 personnel (military, DOD, civilian, and contractors) that work for, or are stationed on the base.

Through the purchase of goods and services and payment of salaries (payroll), Offutt provides approximately $1.3 billion (fiscal year [FY] 2013) in economic benefit to the local and regional economy on an annual basis. Figure 3-1 illustrates the total impact separated into typical economic impact categories.

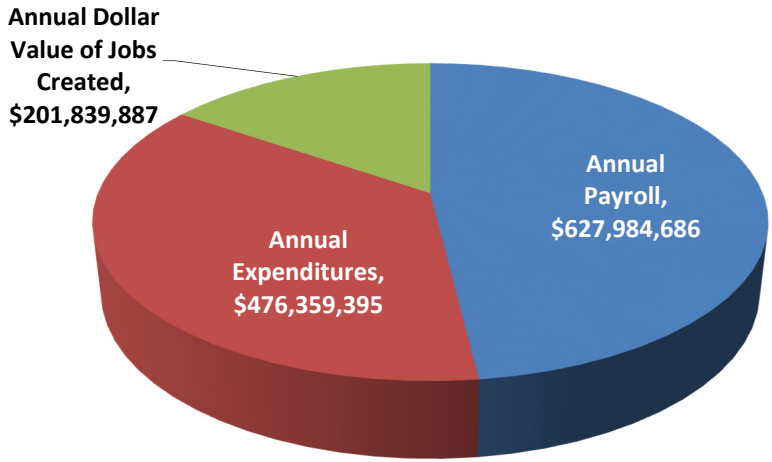


Figure 3-1. FY 2013 Offutt AFB Economic Impact

Source Offutt Air Force Base Economic Impact Analysis, 2013

3.4 Military Strategic Importance

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

Offutt AFB is home to three military commands. Major tenant commands at Offutt AFB include United States Strategic Command, 557th Weather Wing, and the 55th Wing of the Air Combat Command. The 55th Wing acts as the command wing for the base and is the largest wing within the Air Force's Air Combat Commands.

The installation's most important element is its location. The base's central location in the US makes it difficult for potential enemy missile strike to reach the site, providing the installation more allotted time to respond to such threats.

RC-135 Cobra Bell aircraft at Offutt AFB

Public Outreach and Involvement

As a community presence, Offutt AFB contributes more than just to the local economy. Offutt AFB recognizes that in a large metropolitan city continued support of the local population and government officials is invaluable. Offutt AFB, both the 55th Wing and other tenants on-base, engages in many public outreach efforts to make itself a greater part of the local and regional community. An overview of these programs and services is provided in Chapter 1 of this Background Report, in section 1.7 Local Communities Working Together.

3.5 Installation Setting

Offutt AFB is located in eastern Sarpy County, Nebraska, 10 miles south of the City of Omaha and adjacent to the City of Bellevue. Four miles north of the base lies Interstate 80 (I-80), it connects to US Highway 75 which borders the installation on the west and I-29 on the east. The US Highway 75 and I-29 then connect to US Highway 34 which lies directly south of Offutt AFB. Offutt AFB is considered to be a part of the Omaha-Council Bluffs metropolitan area. The installation comprises 4,041 acres; it also operates Capehart Housing Area and transmitter and receiver sites that are located in various communities across Nebraska.

The installation is broken up into multiple districts including the North, Airfield, Central, Southeast, and Historic. The North District includes the Kenney and Bellevue gates, the Martin Bomber building, the Airman Leadership School, the Child Development Center, the Navy Operational Support Center, and the 557th Weather Wing Headquarters. The Airfield District includes the runway, measuring 11,700 feet long, and its associated facilities. The Central District includes the USSTRATCOM Gate, the current USSTRATCOM facility, the location of the future new USSTRATCOM facility, the Exchange and Commissary buildings, the Fire Training area, and other facilities. The Southeast District includes recreational and fitness areas and supporting facilities for base operations. The Historic District is a

memorable landmark, containing the original army living quarters, barracks, and parade grounds. Base Lake, another recreational area, is on the east side of the base, on the other side of Harlan Lewis Road.

Offutt AFB Kenney Gate

Offutt AFB has several buildings that were built in the 1950's through the 70's including dormitories for on-base military housing, Main Exchange, Commissary, and library. Some of the original buildings from Fort Crook are still located on the site. Other facilities that exist on the installation include restaurants, gas stations, and a fitness center. Available family housing and schools are located west of US Highway 75, one mile from the base, known as the Rising View Community. This area provides other community services such as a medical clinic, two chapels, 18-hole golf course, youth and child development center, movie theater and two elementary schools.

New opportunities for Offutt AFB include reuse and development considerations. A new USSTRATCOM headquarters building is currently being built. Once it is complete and operational, and personnel move in, this will allow other buildings to be considered for reuse or demolition. Many of the existing facilities on the installation's grounds have been determined for reuse to help reduce the amount of demolition and reconstruction. Repurposing the facilities will allow for the buildings to outlive their service life span. The Offutt Field House, existing USSTRATCOM, and historic barrack facilities all have options for reuse too. The existing Martin Bomber Building, Fairchild Hall, and other buildings on base have been considered for demolition due to their age and lack of functionality.

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

Source: Final Integrated Natural Resource Management Plan, March 2010, Offutt AFB Installation Development and Design, 2011.

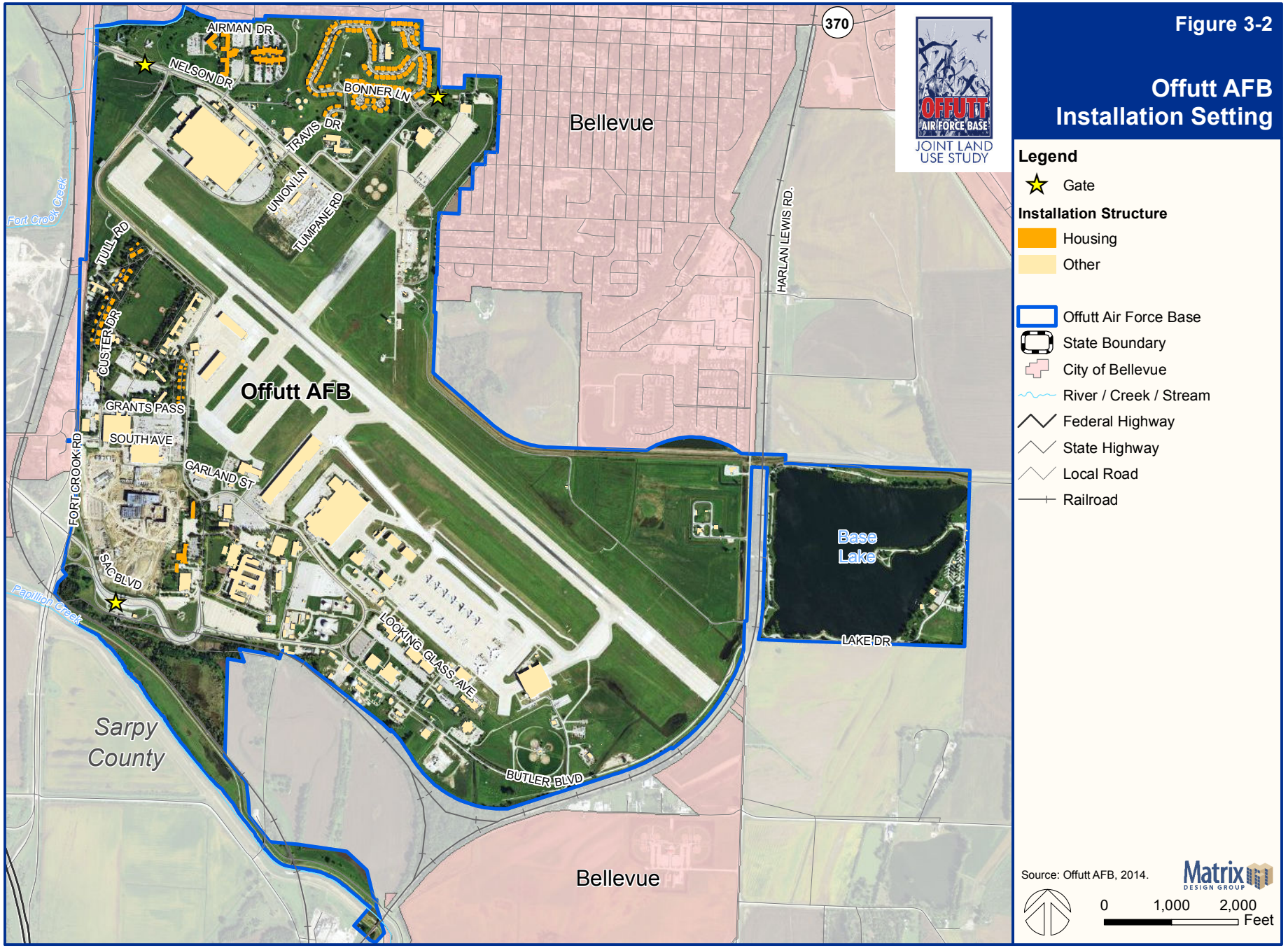


Figure 3-2
Offutt AFB
Installation Setting
Legend
Gate
Installation Structure
Housing
Other
Offutt Air Force Base
State Boundary
City of Bellevue
River / Creek / Stream
Federal Highway
State Highway
Local Road
Railroad
Source: Offutt AFB, 2014.
Matrix DESIGN GROUP
0
1,000
2,000
Feet
OFFUTT AIR FORCE BASE
JOINT LAND USE STUDY
Offutt AFB
Bellevue
Bellevue
Sarpy County
Base Lake
370
AIRMAN DR
NELSON DR
BONNER LN
TRAVIS DR
UNION LN
TUMPANE RD
TULL RD
CUSTER DR
GRANTS PASS
SOUTH AVE
GARLAND ST
FORT CROOK RD
SAC BLVD
LOOKING GLASS AVE
BUTLER BLVD
LAKE DR
HARLAN LEWIS RD.
Fort Crook Creek
Papillion Creek

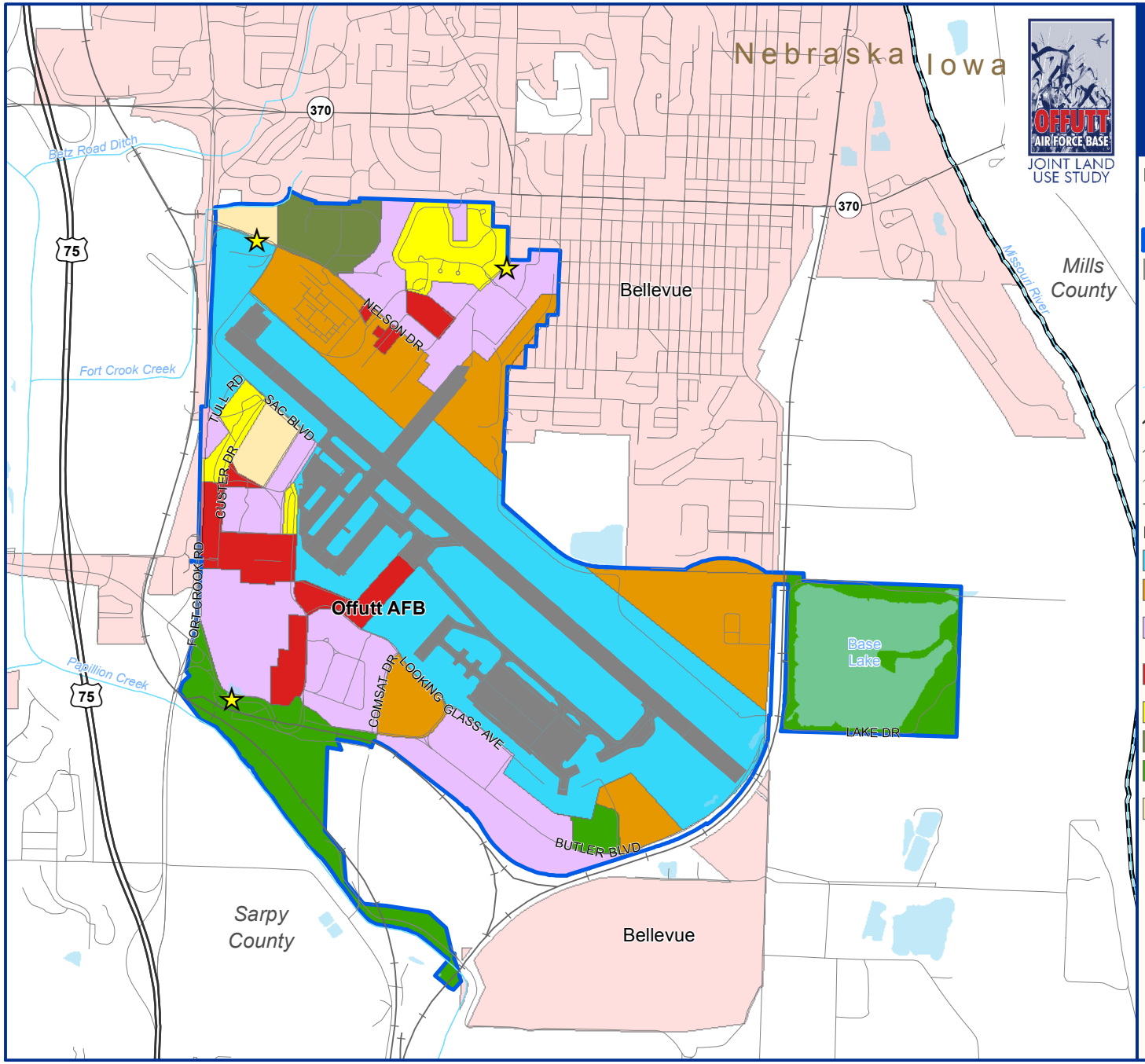


Figure 3-3

Offutt AFB Land Use

Legend

- Gate
- Offutt Air Force Base
- Airfield Surface / Runway
- State Boundary
- City of Bellevue
- Water Body
- River / Creek / Stream
- Federal Highway
- State Highway
- Local Road
- Railroad

Land Use

- Flightline
- Industrial
- Adminstrative/Education/ Communications
- Community Commercial & Services
- Family Housing
- Airmen's Housing
- Outdoor Recreation Areas
- Designated Open Space & Heritage Areas

Source: Offutt AFB Installation Development and Design, July 2011.

Matrix Design Group

0 ¼ ½ Mile

3.6 Current Mission Operations

Mission

The mission of the 55th Wing states "To provide dominant intelligence, surveillance, reconnaissance, electronic attack, command and control, and precision awareness to national leadership and warfighters across the spectrum of conflict any time, any place". Other missions of the 55th Wing include providing support to other base units, combat ready personnel, and training operations for pilots, navigators, and warfare officers.

Offutt AFB provides information for the President and Secretary of Defense on enemy intentions, locations, capabilities and predicted operations. The installation also provides patient-centered care, world class mission support, and communication support during operations.

With the multiple missions that Offutt AFB provides, the main supporting action is the installation's ability to provide a safe command and control platform for the President and DOD to carry out their missions during a time of national crisis. Current flight operations at Offutt AFB include straight out departures and in approach, overhead landing patterns, radar closed patterns, closed patterns, and re-entry visual flight rule patterns.

Vision

To provide unmatched intelligence, surveillance, reconnaissance, electronic attack, and command and control capabilities across the range of military operations.

The tables on the following pages provide an overview of the six key aircraft that operate at Offutt AFB, and their missions.

3.7 Future Mission Operations

Currently, there are no new future missions planned for Offutt AFB. However, Offutt AFB is capable of receiving certain types of future missions should that decision be made by the Department of Defense or the Air Force.

The Offutt AFB Installation Development and Design plan identifies a goal to retain options for attracting new missions to Offutt AFB when siting new facilities, including utilizing re-use and infill. A new USSTRATCOM headquarters building is currently under construction at Offutt AFB. Once the new USSTRATCOM headquarters building is complete, several buildings will be re-used for other tenants which will allow for some relocation of personnel around the base.

The future improvements for Offutt AFB involve enhanced advances in strategic combat capabilities for tomorrow's crises. There are several improvements and new development projects on Offutt AFB's long range construction plan including tearing down the main bomber plant, new road and gate access, and a new USSTRATCOM headquarters, which is currently under construction and estimated for completion in 2016, with a move-in-ready date of 2018. These improvements have an anticipated cost of several billion dollars, representing a large investment in the continued operation and available opportunities at the installation.

OVERVIEW OF KEY AIRCRAFT AT OFFUTT AFB

E-4B

The E-4B aircraft is meant to be used by the National Command Authority as a survivable command post for control of US forces in all levels of conflict.

Length: 231 ft., 4 in.
Height: 63 ft., 5 in.
Wingspan: 195 ft., 8 in.
Speed: 602 mph
Ceiling: 30,000+ ft.
Range: 6,200 nm

Crew: 112 (flight and mission crew)

Armament: None

Source: US Air Force Fact Sheets, E-4B, 2005

OC-135B

The OC-135B is an observation aircraft that supports the Open Skies Treaty. The aircraft flies unarmed observation flights over participating parties of the Open Skies Treaty.

Length: 135 ft.
Height: 42 ft.
Wingspan: 131 ft.
Speed: 500+ mph
Ceiling: N/A
Range: 4,050 nm

Crew: 7 (3 pilots, 2 navigators, and 2 sensor maintenance technicians)

Armament: None

Source: US Air Force Fact Sheets, OC-135B Open Skies, 2001

WC-135

The WC-135 Constant Phoenix collects particulate and gaseous effluent and debris from the atmosphere to detect radioactive clouds in real time.

Length: 139 ft., 11 in.
Height: 42 ft.
Wingspan: 130 ft., 10 in.
Speed: 403 mph
Ceiling: 40,000 ft.
Range: 4,000 nm

Crew: Varies

Armament: None

Source: US Air Force Fact Sheets, WC-135 Constant Phoenix, 2005

RC-135V/W

The RC-135V/W River Joint reconnaissance aircraft identifies enemy operations and intentions.

Length: 135 ft.
Height: 42 ft.
Wingspan: 131 ft.
Speed: 500+ mph
Ceiling: 50,000 ft.
Range: 3,900 nm

Crew: 5 (three pilots and 2 navigators)

Armament: None

Source: US Air Force Fact Sheets, RC-135V/W River Joint, 2012

Source: http://www.offutt.af.mil/main/welcome.asp

OVERVIEW OF KEY AIRCRAFT AT OFFUTT AFB (continued)

RC-135U

The RC-135U Combat Sent provides strategic electronic reconnaissance information to national and military leaders. Collected data is saved for further analysis by the DOD commands.

Length: 140 ft., 1 in.
Height: 41 ft., 8 in.
Wingspan: 135 ft., 1 in.
Speed: 500+ mph
Ceiling: 35,000+ ft.
Range: 4,000 nm

Crew: 3 (2 pilots, navigator, 2 airborne

Armament: None

Source: US Air Force Fact Sheets, RC-135U Combat Sent, 2005

RC-135S

The RC-135S Cobra Ball collects optical and electromagnetic data on ballistic targets. The data is used to ensure arms treaty compliance and development of US strategic defense concepts.

Length: 135 ft.
Height: 42 ft.
Wingspan: 131 ft.
Speed: 500+ mph
Ceiling: N/A
Range: N/A

Crew: Varies

Armament: None

Source: US Air Force Fact Sheets, RC-135S Cobra Ball, 2012

Source: http://www.offutt.af.mil/main/welcome.asp

3.8 Units at Offutt AFB

The Offutt AFB mission is supported by multiple units (under the direct command of the Commanding Officer of Offutt AFB) and tenant units (units that report to other organizations and utilize space or facilities at Offutt AFB) that enable the missions to be executed on a daily basis. The following pages briefly summarize major units or tenants and their function in the organization. There are dozens of units and tenants at Offutt AFB, so for the purposes of summary, not all of them are discussed here.

55th Wing Host Unit

As the Air Force's largest wing, operating on four different continents, the Wing is able to support seven flying missions. The unit is able to provide the world with combat ready, fighting commanders in time of war. The wing is also able to provide services for both military and civilian members including performances for base mobility functions, and staff requirements.

Major Tenants

US Strategic Command

US Strategic Command integrates and coordinates the necessary command and control capability to provide support with the most accurate and timely information for national leaders and military commanders. USSTRATCOM has historically been charged with operational control of US nuclear forces but additional duties have been assigned including strategic deterrence, space operations, cyberspace operations; joint electronic warfare; integrated missile defense; intelligence, surveillance and reconnaissance; global strike; analysis and targeting; and combating weapons of mass destruction.

With over 4,000 employees, the USSTRATCOM at Offutt AFB has a focus on command and control and strategic-level integration and advocacy for USSTRATCOM missions. Missions involve planning and execution for daily operations and primary missions. These require service-specific component commands that are necessary to carry out the missions.

Strategic Communications Wing One Detachment

The Strategic Communications Wing One (SCW-1) Detachment helps to accomplish Airborne Command Post missions of USSTRATCOM. The Navy is in charge of the Detachment and has been in command and control of submerged ballistic missile submarines, Air Force bombers, and land-based missile silos. Similarly, the Detachment has responsibility for the daily operation of the Campisi Alert Facility at Offutt AFB.

557th Weather Wing

The mission of the 557th Weather Wing is to maximize "America's power through exploitation of timely, accurate, and relevant weather information; anytime, everywhere". The $175 million annual budget allows for the 557th Weather Wing to develop, evaluate, test, and transition new technology to weather teams around the world. Products and data range from forecasts, climatology, and space weather. With over 1,100 men and women worldwide, the agency is able to provide information to continue everyday military operations, and bring relief efforts to the United States citizens.

Units

20th Intelligence Squadron

The 20th Intelligence Squadron (IS) has a history of intelligence gathering missions in areas across the globe since World War II. The 20th IS provides geospatial and target intelligence to the military. The 20th IS also provides

the Air Force with target coordination training and certification, as well as estimation training for collateral damage.

343d Recruiting Squadron

The 343d Recruiting Squadron is the active duty recruiting squadron that is tasked with recruiting people to join the Air Force. The 343d Recruiting Squadron covers seven states – Iowa, Michigan, Minnesota, Nebraska, North Dakota, South Dakota, and Wisconsin.

United States Air Force Heartland of America Band

The United States Air Force Heartland of America Band is a 16-member group of musicians who provide innovative, professional musical support for military events. The Band serves the various partner commands at Offutt AFB but also provide a wide variety of community outreach missions throughout Nebraska.

Defense Prisoner of War / Missing in Action Accounting Agency

The Defense Prisoner of War / Missing in Action Accounting Agency (DPAA) was established in January 2015 to provide a world-class workforce that fulfills the nation's obligation by maximizing the number of missing personnel accounted for while ensuring timely, accurate information is provided to their families.

Source: 55th Wing Mission Brief, Brig Gen. Gregory M. Guillot; http://www.afweather.af.mil/units/airforceweatheragency; http://www.stratcom.mil/about/; Offutt Air Force Base Economic Impact Analysis, 2013.

Nebraska Air National Guard

The Nebraska Air National Guard (NEANG) is an active duty force whose mission is to provide protective services in order to preserve the peace and safety of the public. The NEANG is subject to deployment orders and tasks that support the country's civil defenses. Additionally, under command of the NEANG is the 170th Group, established in 2002, which trains airmen to provide operational support to the 55th Wing's mission.

3.9 Offutt AFB Mission Footprint

Understanding the spatial patterns of the military operational areas is essential for promoting complimentary land use development decisions outside the fenceline.

Mission activities conducted on and around Offutt AFB can generate potential impacts on surrounding community areas if incompatible land uses develop. Examples of potential mission impacts on surrounding communities include noise and vibration from overhead flights and the risk of an aircraft accident. Conversely, the military mission is susceptible to hazards and other incompatibilities created by certain types of civilian development or activities, such as obstructions to air space or location of noise sensitive uses in high noise zones. Understanding the overlapping spatial patterns of these compatibility zones, or "mission footprint" is essential for promoting compatible and informed land use decisions.

There are several elements that make up the mission footprint that extends outside the Offutt AFB boundaries. These essential elements play a key role in the installation's viability for sustaining current and future mission operations. These elements are listed below and described in more detail on the following pages.

Offutt AFB Footprint Elements

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

Please see the next page.

Airfield Approach and Departure Flight Tracks

According to the Offutt AFB Air Installation Compatible Use Zone (AICUZ) Report, flight tracks are developed to provide guidance on the range of standard operations that may occur at the airfield. These are created using information gathered from air traffic controllers, pilots, and other sources. When flight tracks are developed they attempt to avoid urban development as much as possible to reduce impacts and risk to the general public and commercial or general aviation activities, but safety of operations is paramount in the design of these patterns. Figure 3-4 illustrates the primary flight tracks used by Offutt AFB aircraft. Other flight tracks may also be used depending on aspects such as weather or mission.

The closed pattern flight tracks are isolated to areas surrounding the installation and consist of low-level altitude flights. As shown on Figure 3-4, the closed pattern flight tracks tend to stay away from heavily populated areas, but affect parts of the Capehart Housing Development, northwestern Plattsmouth, and southeastern Papillion. The operation performed by the aircraft using these flight tracks can potentially create noise and vibration impacts on land uses under these paths.

Source: Air Installation Compatible Use Zone Report, Offutt Air Force Base, November 2007

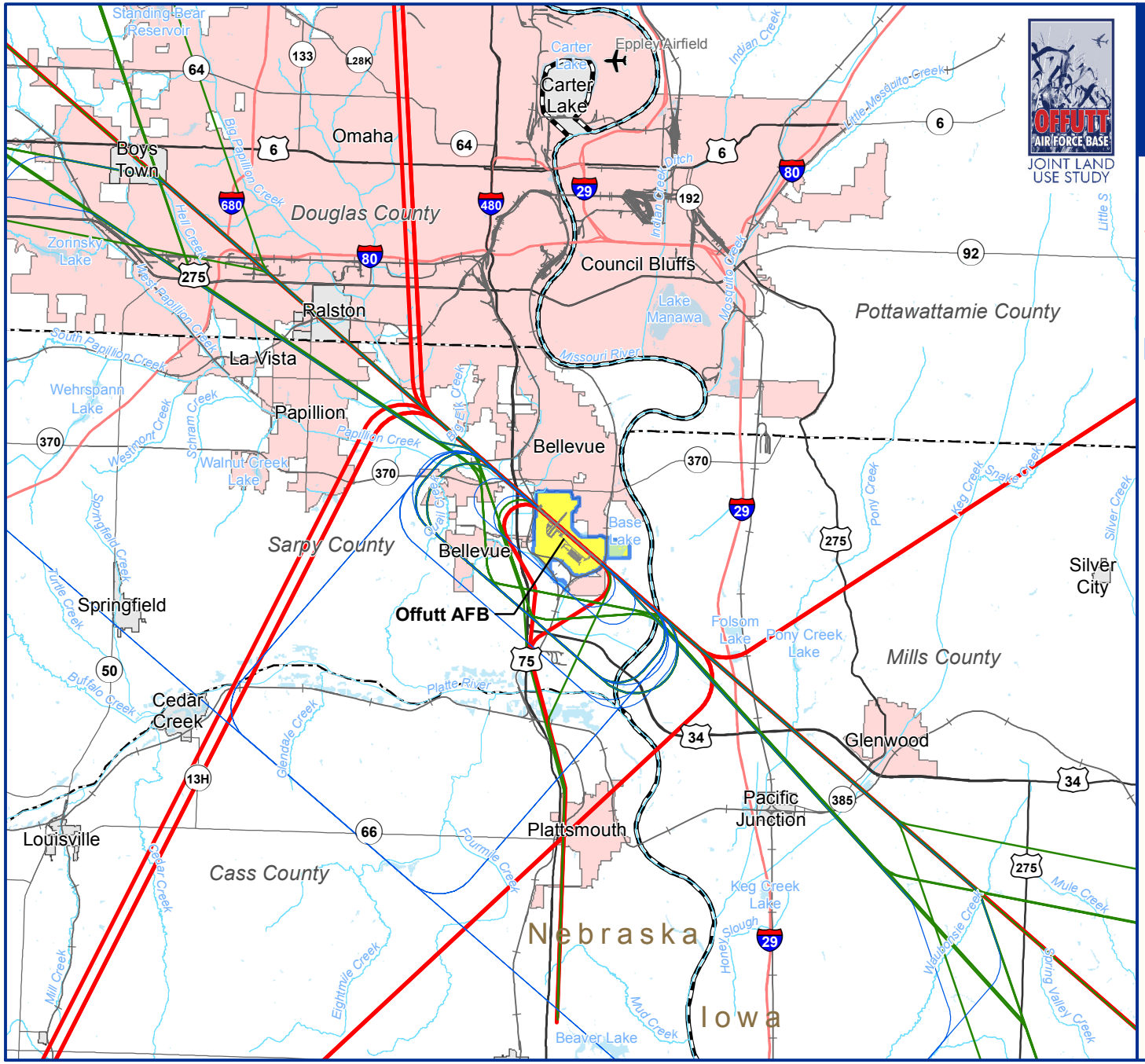


Figure 3-4
Offutt AFB Mission Footprint: Flight Patterns

Legend

Primary Fixed-Wing Flight Track
- Departure
- Arrival
- Closed Pattern

- Offutt Air Force Base
- Airfield Surface / Runway
- State Boundary
- County Boundary
- City included in JLUS
- Other City
- Water Body
- River / Creek / Stream
- Interstate
- Federal Highway
- State Highway
- Railroad
- Eppley Airfield

Source: Offutt AFB, 2015.

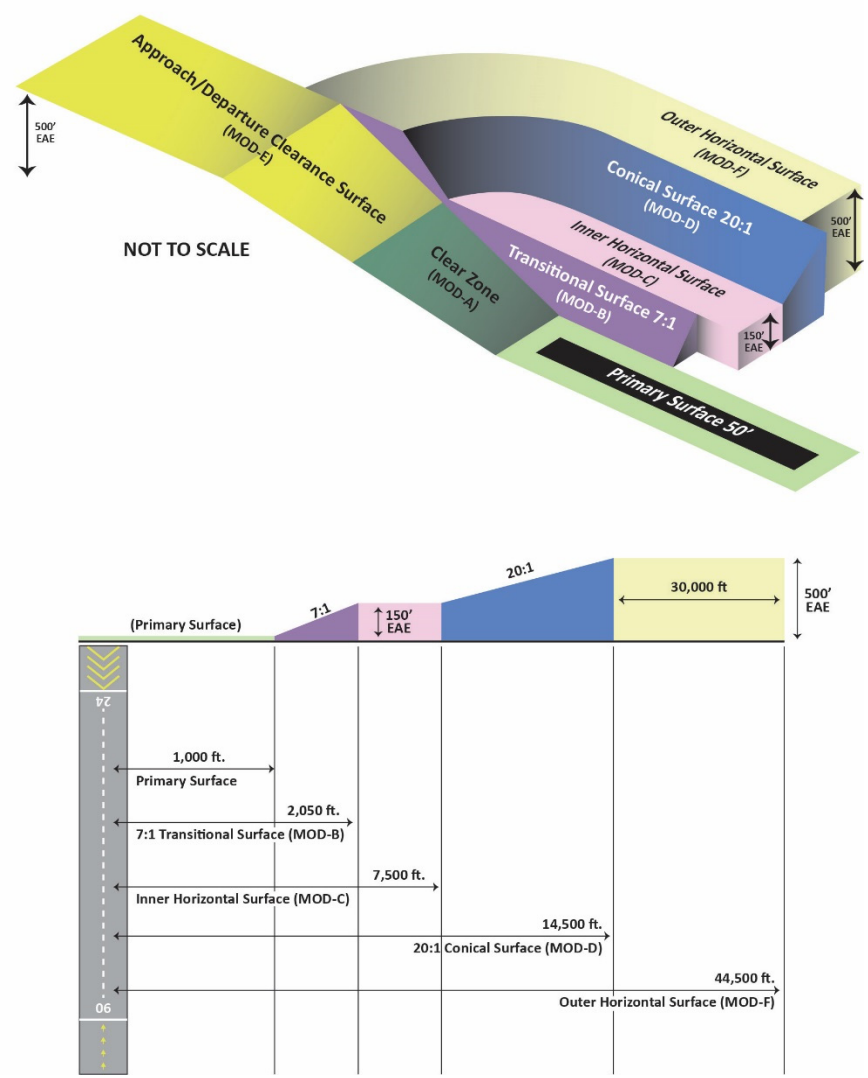
Matrix Design Group

0 2 4 Miles

Imaginary Surfaces

Federal Aviation Regulations, Part 77 specify a series of imaginary height restriction surfaces surrounding an airport. The imaginary surfaces of an active runway are used to define the required airspace that must remain free of vertical obstructions in the vicinity of aviation operations to ensure safe flight operations. The illustration to the right shows the slope of the surfaces that help guide military and community planners in land use planning around an airfield. Structures should not exceed these heights to protect the navigable airspace associated with the airfield, the safety of pilots and people, and the land uses on the ground. This is especially important in the clear zone and the approach-departure surfaces.

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



Example views of the different imaginary surface layers

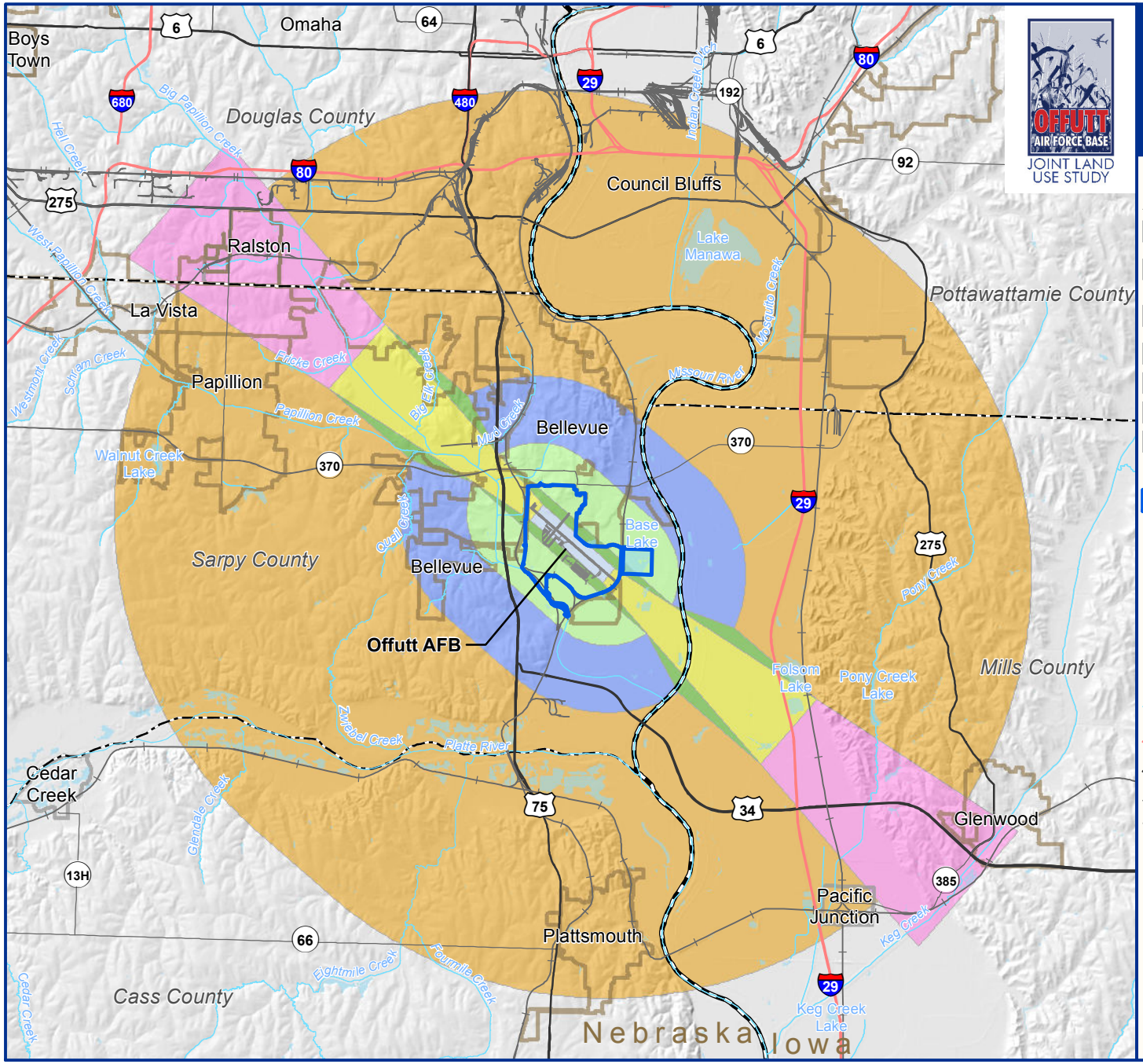


Figure 3-5
Offutt AFB Mission Footprint: Imaginary Surfaces

Legend

Airfield Imaginary Surface

- Primary Surface
- Approach/Departure Clearance Surface (glide angle)
- Approach/Departure Clearance Surface (horizontal)
- Inner Horizontal Surface
- Conical Surface
- Outer Horizontal Surface
- Transitional Surface

- Offutt Air Force Base
- Airfield Surface / Runway
- State Boundary
- County Boundary
- City included in JLUS
- Other City
- Water Body
- River / Creek / Stream
- Interstate
- Federal Highway
- State Highway
- Railroad

Source: Offutt AFB, 2014.

Matrix Design Group

0 1.5 3 Miles

Airfield Accident Potential Zones

In addition to the assessment of imaginary surfaces, the second element of the airfield safety analysis is the assessment of Accident Potential Zones (APZs). Per Air Force regulations, APZs are developed to assist military and community planners in developing land uses that are compatible with airfield operations, thereby protecting health and safety. Within these zones, there are recommended types, densities, and intensities of land uses. While the likelihood of an aircraft mishap occurring is remote, the Air Force identified APZs provide the best practical solution for public safety.

There are three safety zones that extend from the ends of runways: Clear Zone (CZ) and APZ I and APZ II. These are illustrated on Figure 3-6.

The CZ begins at each end of the runway. At Offutt AFB, the Runway 12 CZ measures 3,000 feet wide by 3,800 feet long and the Runway 30 CZ measures 3,000 feet wide by 3,997 feet long. This is the area that has the highest potential of an aircraft incident. It is recommended that no development occur in the CZ unless it is a use that is needed for safe operations of aircraft.

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

The APZ II is an area that begins at the end of each APZ I and is 3,000 feet wide by 7,000 feet long. Again, the accident potential in this area reduces further, and with this, some additional development types are allowed.

The Offutt AFB AICUZ Report provides a complete listing of the land uses that are not recommended for use in the CZ, APZ I and APZ II. In these recommendations, some land uses also have recommended limits on density and intensity of use. Communities are encouraged to incorporate these land use recommendations into their planning and regulatory documents. This helps to protect public health and safety and maintain compatibility with continued operations at the military airfield.

Source: Air Installation Compatible Use Zone Report, Offutt Air Force Base, November 2007

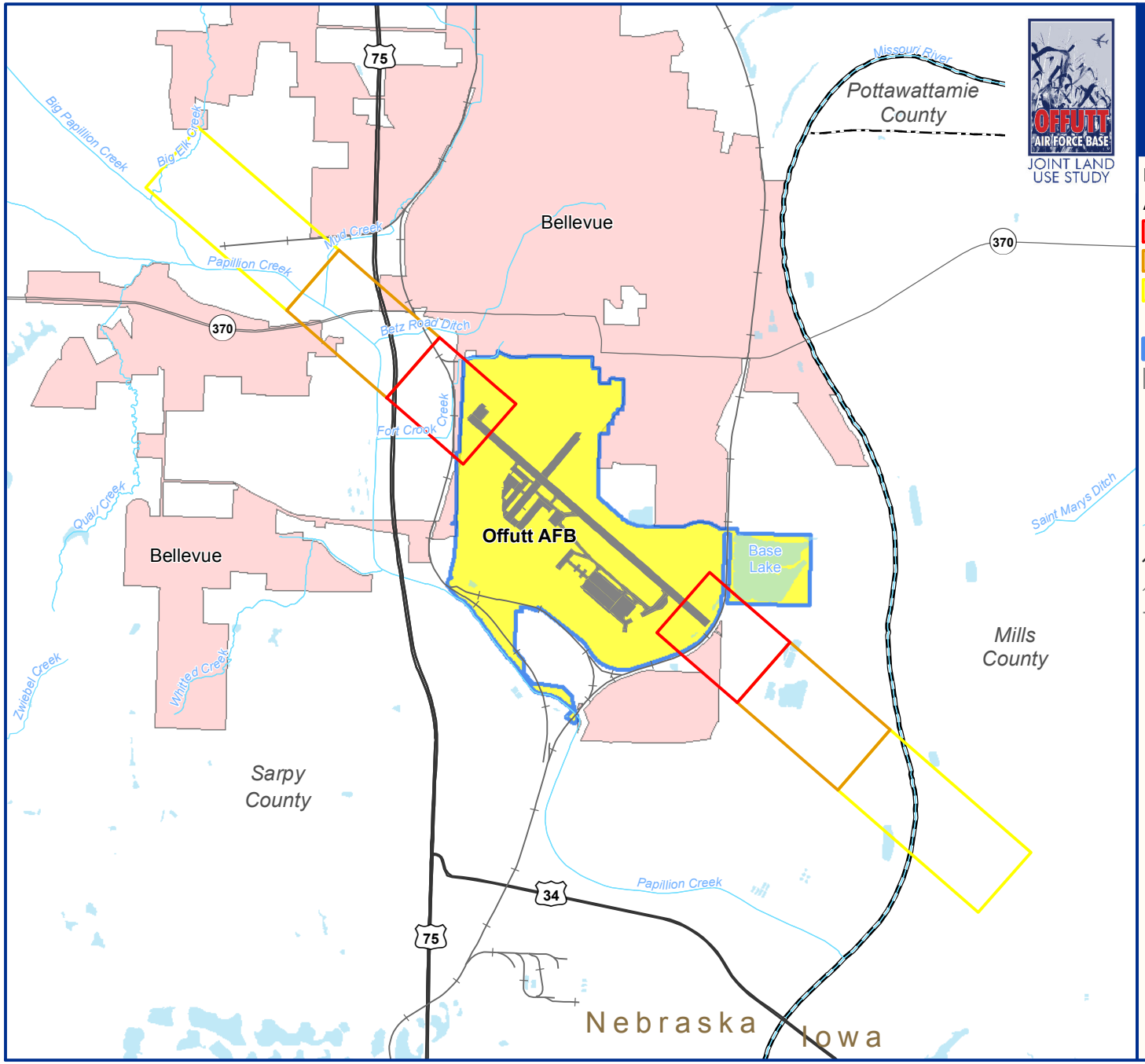


Figure 3-6

Offutt AFB Mission Footprint: Accident Potential Zones

Legend

Accident Potential Zones

- CZ
- APZ I
- APZ II

- Offutt Air Force Base
- Airfield Surface / Runway
- State Boundary
- County Boundary
- City included in JLUS
- Water Body
- River / Creek / Stream
- Federal Highway
- State Highway
- Railroad

Source: Offutt AFB AICUZ, 2007.

0 0.5 1 Mile

Airfield Noise Contours

Aircraft noise can come from flight operations (overflight, take-offs, landings, touch-and-go operations) and engine maintenance run-ups. The Air Force considers how its operations impact the local community by calculating an average-weighted noise level measured as a day-night average A-weighted sound level (DNL). The Offutt AFB AICUZ uses the DOD NOISEMAP program to produce noise contours indicating noise exposure levels from aircraft operations; this is an average of all types of aircraft at Offutt AFB.

The contour lines developed in the model range from 60 decibel (dB) DNL to 80 dB DNL and increase in increments of five dB. The 80 dB DNL is the "loudest" contour line computed and the 60 dB DNL is the "quietest". The DNL measure has been determined to be a reliable measure of community sensitivity to aircraft noise and has become a standard metric used to map aircraft noise impacts.

Noise contours are typically generated during the AICUZ Report process. Offutt AFB's AICUZ was updated in 2007 to reflect a change in aircraft equipment and mission operations. This revised AICUZ included changes to the noise contours. The previous noise contours were from 1992 and were larger than the new ones developed with the 2007 AICUZ. However, in order to maintain mission noise protection and civilian development, both the City of Bellevue and Offutt AFB use the 1992 noise contours for planning purposes of future development. The 1992 noise contours are illustrated on Figure 3-7.

To the south and east of Offutt AFB are agricultural uses. Similarly, the noise contours fall around the base mostly over open space and undeveloped land. However, there are some noise sensitive uses, such as housing within the 65 and 70 dB DNL contours.

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

In efforts to minimize noise for citizens in surrounding communities, engine run-up locations have been placed in areas that are less likely to impact day to day life. Offutt AFB does not operate late night engine run-ups, but there is the potential for unpredicted contingencies that would require nighttime engine run-ups.

Source: Air Installation Compatible Use Zone Report, Offutt Air Force Base, November 2007

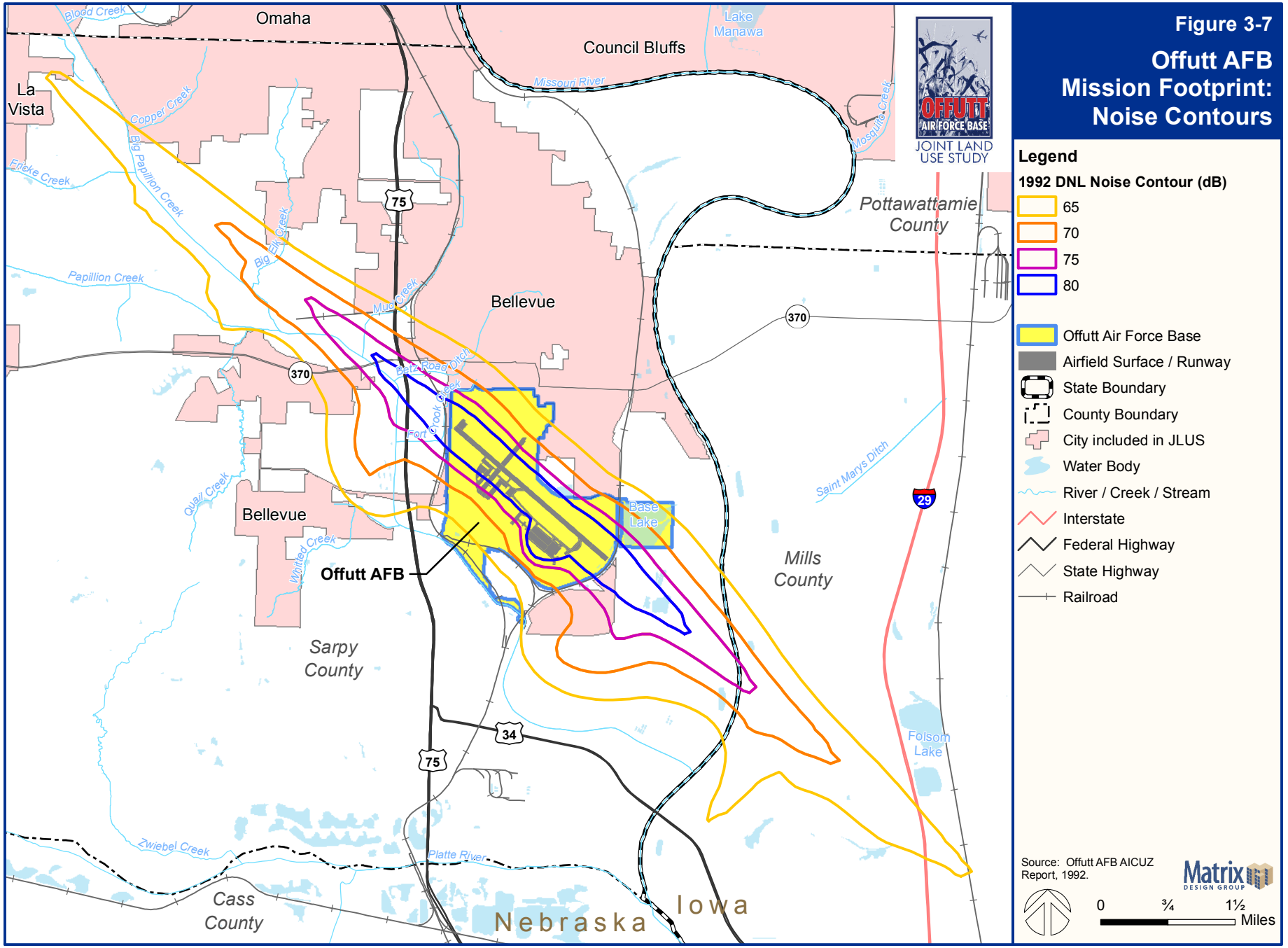


Figure 3-7

Offutt AFB Mission Footprint: Noise Contours

Legend

1992 DNL Noise Contour (dB)

- 65
- 70
- 75
- 80

- Offutt Air Force Base
- Airfield Surface / Runway
- State Boundary
- County Boundary
- City included in JLUS
- Water Body
- River / Creek / Stream
- Interstate
- Federal Highway
- State Highway
- Railroad

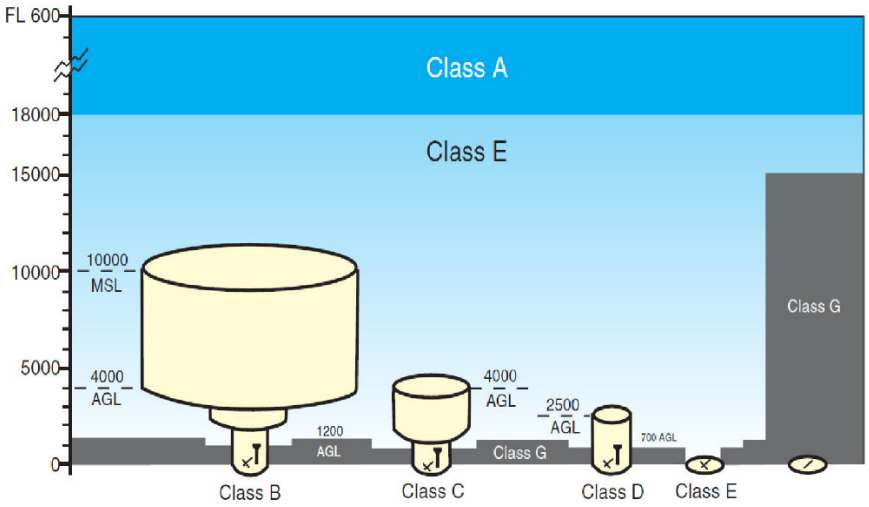
Source: Offutt AFB AICUZ Report, 1992.

Matrix Design Group

0 ¾ 1½ Miles

Airspace Control

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



Within the JLUS Study Area, Offutt AFB and Eppley Airfield are surrounded by Class C airspace. The vertical boundary is 4,000 feet above the airport elevation (the "ceiling"). The core surface area has a radius of five nautical miles and goes from the airport elevation to the ceiling of the Class C airspace. The upper "shelf" area has a radius of ten nautical miles, and extends from as low as 1,200 feet up to the ceiling of the airspace.

An air traffic control (ATC) clearance is not required in Class C airspace, but pilots must be in radio communication with ATC, and aircraft must be equipped with an altitude-encoding transponder.

Pilots flying under VFR in Class C airspace must have at least three miles of visibility. They also must maintain a specified distance from the clouds.

Figure 3-8 shows the FAA Sectional Chart of the area and shows the Class C airspace areas described (highlighted in red for emphasis).

Figure 3-8

Offutt AFB Airspace Control

Part 77 Vertical Obstruction Compliance

The Federal Aviation Act was enacted in 1958 to provide methods for overseeing and regulating civilian and military use of airspace over the United States. It requires the Secretary of Transportation to make long-range plans that formulate policy for the orderly development and use of navigable airspace. The intent is to serve the needs of both civilian aeronautics and national defense, but it does not specifically address the needs of military agencies. The Federal Aviation Administration (FAA) was created as a result of the Act for a variety of purposes, including the management of airspace over the US.

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

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

As of January 29, 2013, the main focus of Part 77.17 is to establish standards to determine obstructions within navigable airspace, typically within a certain distance from an airport or airfield. It defines an obstruction to air navigation as an object that is of greater height than any of several measures. A key reference used for compatibility planning is the following:

> *A height that is 200 feet AGL or above the established airport elevation, whichever is higher, and within three nautical miles of the established reference point of an airport, excluding heliports, with its longest runway more than 3,200 feet in actual length is considered a vertical obstruction. This height increases in the proportion of 100 feet for each additional nautical mile of distance from the airport up to a maximum of 499 feet.*

Figure 3-9 provides an illustration of this measure of vertical obstruction. Note that this is in addition to, not a replacement of, imaginary surface, discussed previously.

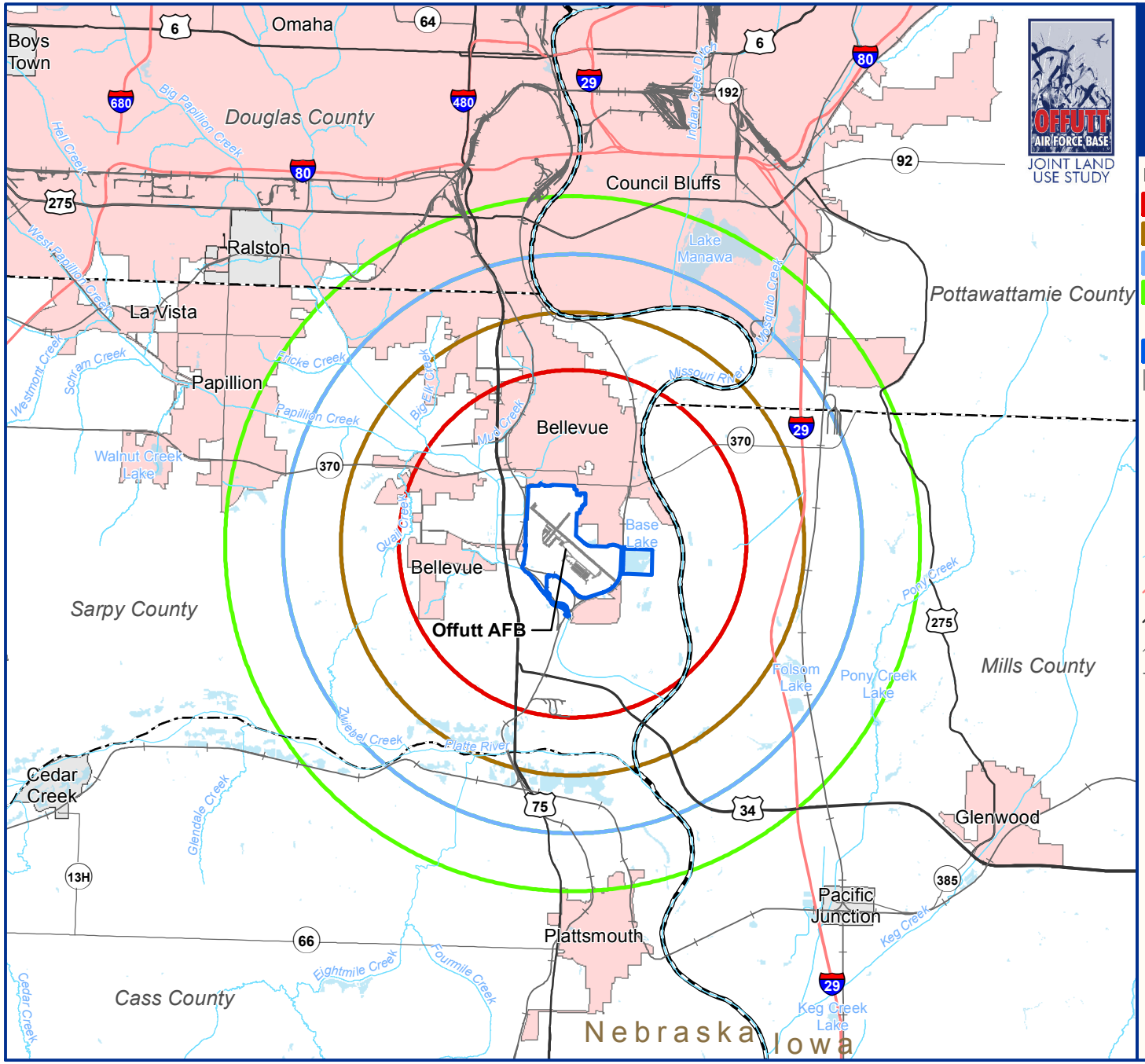


Figure 3-9

Offutt AFB Mission Footprint: Part 77

Legend

- Up to 200' @ 3NM
- Up to 300' @ 4NM
- Up to 400' @ 5NM
- Up to 500' @ 6NM
- Offutt Air Force Base
- Airfield Surface / Runway
- State Boundary
- County Boundary
- City included in JLUS
- Other City
- Water Body
- River / Creek / Stream
- Interstate
- Federal Highway
- State Highway
- Railroad

Source: Matrix Design Group, 2015.

0 1.5 3 Miles

Bird / Wildlife Aircraft Strike Hazard Relevancy Area

Birds and animals can present a significant hazard to military flight operations. While fatal accidents have been limited, impacts can be a safety concern and cause significant damage to aircraft. Bird or animal strikes since 1980 have approached approximately 20,000 events that have resulted in 2 deaths, 25 aircraft destroyed and over $300 million in damage. Since 2004, Offutt AFB has experienced 29 damaging bird strikes that have resulted in $9.2 million dollars in damage.

Certain types of land uses attract birds and wildlife, such as open water areas, standing water, and other natural areas. The location of Offutt AFB near the Missouri and Platte Rivers increases the risk for BASH incidents. Relative to compatibility, the control of attractions near the airfield is important.

A BASH program has already been adopted by Offutt AFB to reduce the impact of birds on aircraft operations. Figure 3-10 shows a five-mile radius around the Offutt AFB airport operations area. Based on FAA statistical analysis, this is the primary area of concern for BASH incidents to occur, and the primary focus of compatibility planning for this issue.

Source: BASH It's Not Just Another Four-Letter Acronym, The Combat Edge, 2012

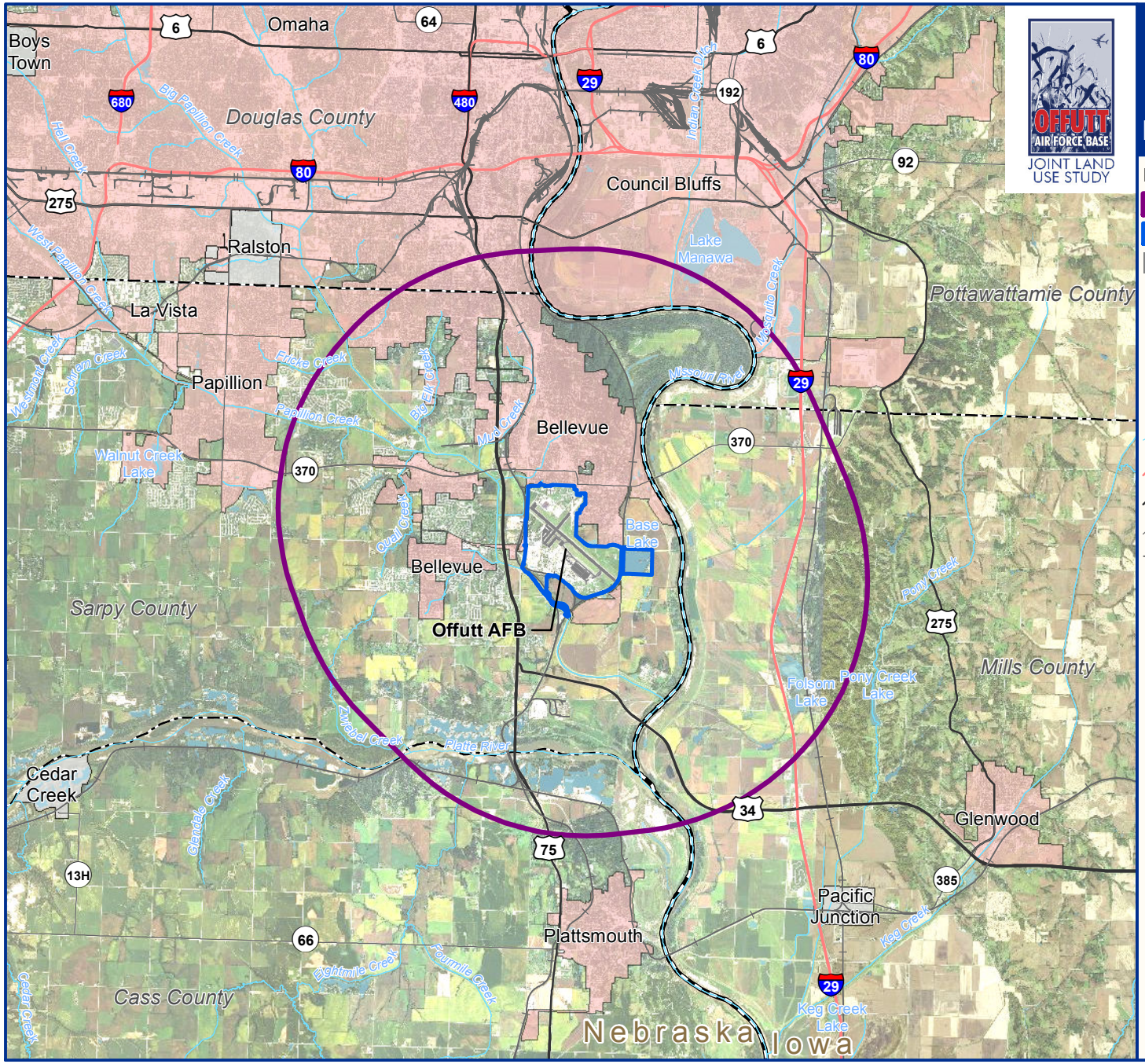


Figure 3-10

Offutt AFB Mission Footprint: BASH Relevancy Area

Legend

- 5-mile BASH Relevancy Area
- Offutt Air Force Base
- Airfield Surface / Runway
- State Boundary
- County Boundary
- City included in JLUS
- Other City
- Water Body
- River / Creek / Stream
- Interstate
- Federal Highway
- State Highway
- Railroad

Source: Matrix Design Group, 2015.

0 1.5 3 Miles

Please see the next page.

Existing Compatibility Tools 4.

Please see the next page.

4. Existing Compatibility Tools

Inside Chapter 4...

4.1 Introduction

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

There are three types of planning tools evaluated relative to their applicability: permanent, semi-permanent, and conditional. Permanent planning tools include acquisition programs, either fee simple purchase of property or the purchase of development rights. Semi-permanent tools include regulations such as zoning or adopted legislation. Conditional tools include memorandums of understanding, intergovernmental agreements, and other policy documents such as comprehensive plans and general plans that can be periodically modified. This review is meant to provide an overview of applicable planning tools and determine how each may apply to compatibility issues identified by the Offutt AFB JLUS process, as presented under the compatibility factors discussed in Chapter 5, Compatibility Assessment.

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

- Federal Programs and Policies
- State of Nebraska Plans and Programs
- State of Nebraska Departments
- State of Nebraska Local Jurisdiction Planning Tools
- Cass County
- City of Plattsmouth
- Douglas County
- City of Omaha
- Sarpy County
- City of Bellevue
- City of La Vista
- City of Papillion
- State of Iowa Plans and Programs
- State of Iowa Departments
- State of Iowa Local Jurisdiction Planning Tools
- Mills County
- City of Glenwood
- Pottawattamie County
- City of Council Bluffs
- Other Tools and References

4.2 Federal Programs and Policies

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

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

The federal plans and programs that are included in this section are:

- Air Force Instruction 90-2001
- Clean Air Act
- Clean Water Act
- Comprehensive Environmental Response, Compensation, and Liability Act
- Department of Defense Conservation Partnering Initiative
- DOD Energy Siting Clearinghouse
- DOD Operational Noise Manual
- Department of Housing and Urban Development Noise Regulation
- Endangered Species Act
- Federal Land Management and Policy Act of 1976
- Federal Aviation Act
- National Environmental Policy Act
- National Pollutant Discharge Elimination System
- Noise Control Act of 1972
- National Historic Preservation Act of 1966
- Partners in Flight Program

- Safe Drinking Water Act
- The Sikes Act
- Telecommunications Act of 1996 and the Federal Communications Commission
- US Avian Hazard Advisory System

Air Force Instruction 90-2001

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

Clean Air Act

The US Clean Air Act empowers the Environmental Protection Agency (EPA) and state environmental agencies to regulate pollution. The Clean Air Act provides for the EPA and state regulatory agencies to establish heightened air quality regulations in counties designated by the EPA as nonattainment for air quality. A map of these counties is available at http://www.epa.gov/oaqps001/greenbk/mapnpoll.html. The JLUS Study Area does include one county (Pottawattamie County in Iowa) that is designated as nonattainment for lead, one of the National Ambient Air Quality Standards pollutants as recognized by the EPA. Consequently, operations at Offutt AFB could be to be impacted by Clean Air Act issues related to the Study Area.

Compliance with the CAA is a high priority for Offutt AFB. Future regulatory changes may expand nonattainment areas to include Offutt AFB. A designation of nonattainment would require Offutt AFB to continue to pursue more efficient equipment and operating procedures to reduce air emissions.

Clean Water Act

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

The CWA is important to Offutt AFB because potential flooding could increase levels of water pollution and decrease water availability. The conservation and protection of water resources is critical to sustaining current and future mission activities.

Comprehensive Environmental Response, Compensation, and Liability Act

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

- established prohibitions and requirements concerning closed and abandoned hazardous waste sites,

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

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

Department of Defense Conservation Partnering Initiative

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

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

DOD Readiness and Environmental Protection Integration

To implement the authority provided by the Department of Defense Conservation Partnering Initiative, the DOD established the Readiness and Environmental Protection Integration (REPI). This initiative enables the DOD to work with state and local governments, NGOs, and willing landowners to limit encroachment and incompatible land use.

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

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

DOD Energy Siting Clearinghouse

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

DOD Operational Noise Manual

The Operational Noise Manual provides a practical reference for military and civilian personnel with duties and responsibilities in operational noise management. The manual assists personnel to understand and implement current DOD environmental policy and guidance. The majority of the

manual is devoted to the following subjects: Characteristics of Sound; Effects of Noise; Military Noise Sources; Noise Monitoring; Reduction of Noise Conflicts and more.

Department of Housing and Urban Development Noise Regulation

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

1. a requirement that noise exposure and sources of noise be given adequate consideration as an integral part of urban environment in connection with all HUD programs, which provide financial support to planning;
2. a withholding of HUD assistance for the construction of new dwelling units on sites (which have or are projected to have unacceptable noise exposure), or are in runway Clear Zones or incompatible uses in Accident Potential Zones;
3. encouragement of modernization efforts for existing buildings in noise environments; and
4. grants and allowances to state and local governments to provide acoustical privacy in multifamily dwellings through building design and acoustical treatment.

Generally, external noise exposure within Noise Zone 3 (as identified in an installation's Airfield Installation Compatible Use Zone (AICUZ) Report is considered unacceptable without exception and within Noise Zone 2 exposure is normally unacceptable with respect to new construction. HUD funds may also be available to encourage noise abatement planning and acoustical treatment for proposed and existing incompatible land uses within the AICUZ.

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

Endangered Species Act

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

Section 7 of the ESA, called Interagency Cooperation, provides the mechanism to ensure that actions taken by federal agencies do not jeopardize the existence of any listed species. As required by Section 7, federal agencies must consult with the USFWS when any action the agency funds, authorizes, or carries out may affect a listed endangered or threatened species. Section 7 consultation is the main way that federal agencies manage takings of species.

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

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

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

Enhancement of survival permits are issued to non-federal landowners participating in Safe Harbor Agreements or Candidate Conservation Agreements with Assurances. These agreements encourage landowners to take actions to benefit species while also providing assurances that they will not be subject to additional regulatory restrictions as a result of their conservation actions.

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

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

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

Recovery Credit System

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

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

will contribute to the downlisting or delisting of endangered or threatened species.

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

At this time there are no listed threatened or endangered species at Offutt AFB.

Federal Land Management and Policy Act of 1976

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

Federal Aviation Act

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

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

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

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

- A height of 499 feet AGL at the site of the object.
- A height that is 200 feet AGL or above the established airport elevation, whichever is higher, within 3 nautical miles of the established reference point of an airport, excluding heliports, with its longest runway more than 3,200 feet in actual length. This height increases in the proportion of 100 feet for each additional nautical

mile of distance from the airport up to a maximum of 499 feet; see Figure 3-6 for an illustration of this portion of the FAA Part 77 Vertical Obstruction Compliance.

- A height within a terminal obstacle clearance area, including an initial approach segment, a departure area, and a circling approach area, which would result in the vertical distance between any point on the object and an established minimum instrument flight altitude within that area or segment to be less than the required obstacle clearance.
- A height within an en route obstacle clearance area, including turn and termination areas, of a federal airway or approved off-airway route, that would increase the minimum obstacle clearance altitude.
- The surface of a takeoff and landing area of a civilian airport or any imaginary surface established under 77.19, Deaprtment of Defense (DOD): 77.21, and heliports: 77.2. However, no part of the takeoff or landing area itself will be considered an obstruction.
- Except for traverse ways on or near an airport with an operative ground traffic control service furnished by an airport traffic control tower or by the airport management and coordinated with the air traffic control service, the standards of paragraph (a) of this section apply to traverse ways used or to be used for the passage of mobile objects only after the heights of these traverse ways are increased by:
    - 17 feet for an Interstate Highway that is part of the National System of Military and Interstate Highways where overcrossings are designed for a minimum of 17 feet vertical distance.
    - 15 feet for any other public roadway.
    - 10 feet or the height of the highest mobile object that would normally traverse the road, whichever is greater, for a private road.
    - 23 feet for a railroad.
    - For a waterway or any other traverse way not previously mentioned, an amount equal to the height of the highest mobile object that would normally traverse it.

The FAA has identified certain imaginary surfaces around runways to determine how structures and facilities are evaluated and identify if they pose a vertical obstruction relative to the airspace around a runway. The levels of imaginary surfaces build upon one another and are designed to eliminate obstructions to air navigation and operations, either natural or man-made. The dimension or size of an imaginary surface depends on the runway classification.

Federal Aviation Administration Order JO 7110.65T

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

National Environmental Policy Act

The National Environmental Policy Act (NEPA) of 1969 is a federal law establishing a US national policy to promote the protection and enhancement of the environment and requiring federal agencies to analyze and consider the potential environmental impact of their actions. The purpose of NEPA is to promote informed decision-making by federal agencies by making detailed information concerning significant environmental impacts available to both agency leaders and the public.

All projects receiving federal funding, requiring a federal permit, or occurring on federal property require NEPA compliance and documentation. NEPA is applicable to all federal agencies, including the military. Not all

federal actions require a full Environmental Impact Statement (EIS). In some cases, an action may not cause a significant impact, whereby an agency is only required to prepare an Environmental Assessment (EA).

A NEPA document can serve as a valuable planning tool for local planning officials. An EA or EIS can assist in the determination of potential impacts that may result from changing military actions or operations and their effect on municipal policies, plans and programs, and the surrounding community. Public hearings are required for all EIS documents released under NEPA. NEPA requires publishing a draft EA and subsequent Finding of No Significant Impact (FONSI) and allowing public comment for a period of 30 days. An EA may result in a FONSI or Record of Decision concluding that the action will have a significant impact and an EIS is required. The information obtained by the EA / EIS is valuable in planning coordination and policy formation at the local government level.

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

National Pollutant Discharge Elimination System

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

Noise Control Act of 1972

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

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

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

Very few noise complaints have been recorded near Offutt AFB. Further land use management will allow for future military missions to continue.

National Historic Preservation Act of 1966

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

Partners in Flight Program

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

Safe Drinking Water Act

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

The Sikes Act

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

Telecommunications Act of 1996 and the Federal Communications Commission

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

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

Telecommunications towers have the potential to cause vertical obstruction issues near Offutt AFB. Requirements for tower placement can help to reduce potential incompatibility.

US Avian Hazard Advisory System

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

4.3 Offutt AFB Plans and Programs

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

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

- Air Installation Compatible Use Zone Report
- Bird / Wildlife Aircraft Strike Hazard Plan
- Integrated Natural Resources Management Plan
- Integrated Cultural Resources Management Plan

Air Installation Compatible Use Zone Report

The Air Installation Compatible Use Zone (AICUZ) program was created by the DOD in 1973 to address noise and safety hazards associated with aviation operations. The AICUZ program was established to minimize impacts from aviation operations (noise and accidents) through specific attention to development and land uses. The AICUZ framework evaluates noise from military aircraft, and applies the concept of clear zones / accident potential zones, with corresponding development / building densities and intensities designed to encourage compatibility between military operations and communities.

The four primary elements of the AICUZ are:

- Noise Zone Footprint. Noise zones classified into three categories: Zone I - noise in this area is compatible with most noise sensitive land uses, Zone II - noise is usually incompatible with noise-sensitive land uses, and Zone III - noise is incompatible with noise-sensitive and other land uses.
- Health, Safety, and Welfare. These elements seek to reduce the nuisance of excessive noise generated by aircraft operations and public danger by discouraging the development of incompatible land uses such as businesses and housing in Accident Potential Zones (APZs).
- Public Investment. Promoting compatibility between a military installation and local communities safeguards military operations and protects the public's investment in the installation.
- Public Awareness and Communication. By working with the community and informing local citizens of operations and safety measures, the military can promote safety for community residents. As local leaders work with military officials to adopt compatible development practices, their relationship is strengthened through the resolution of mutual concerns.

Noise Zone Profile

Noise is the cornerstone of the AICUZ Report. The noise generated by military aircraft operations and the effects of that noise on local communities are presented in a variety of ways in the study (e.g., written text, graphically, etc.). To fully appreciate the findings and recommendations presented in the AICUZ Report, it is beneficial to provide an understanding of how military aircraft noise is measured, evaluated, and graphically illustrated. Day night average sound level (DNL) is a measure of noise commonly used surrounding a military installation. The main sources of noise at airfields are flight operations, which include take-offs, landings, touch-and-go operations, and engine maintenance run-ups. The Air Force considers how its operations impact the local community by calculating the DNL. The DNL averages the noise levels of all aircraft operations that occur within a 24-hour period. The DNL is depicted as a contour around a noise source connecting points of equal value, usually in 5-dB increments.

Accident Potential Zones

As part of the AICUZ program, and to aid in land use planning surrounding military bases, the DOD established Accident Potential Zones (APZs). These

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

The 2007 Offutt AFB AICUZ Study is an update to the Offutt AFB AICUZ Study completed in 1992. It presents a description of the current noise environment around Offutt AFB. It reaffirms the Air Force policy of promoting public health, safety, and general welfare in areas in close proximity to Air Force installations. This study identifies changes in flight operations that have occurred since the 1992 study, and provides current noise zones and compatible use guidelines for land areas adjacent to the installation. It is provided as a tool to assist local communities in future planning and zoning activities. Changes that required an update of the AICUZ study include:

- number and type of aircraft at Offutt AFB,
- installation of quieter aircraft engines,
- changes in the arrival and departure frequencies for all aircraft,
- changes in flight patterns with the additional aircraft and noise abatement procedures,
- operational mission requirements and Air Force reorganization, and
- improvements to the NOISEMAP.

Bird / Wildlife Aircraft Strike Hazard Plan

Offutt AFB maintains a BASH Plan to minimize the threat of bird strikes to aircraft and protect local wildlife. A BASH is designed to minimize wildlife and bird strike damage to military aircraft. A BASH plan is designed to control birds, alert aircrew and operations personnel, and provide increased levels of flight safety, especially during the critical phases of flight, take-off and landing operations. Specifically, the plan is designed to:

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

Integrated Natural Resources Management Plan

The policy of the DOD is to fully comply with applicable federal, state, and county laws, ordinances, regulations, and guidelines, specifically designed to protect and preserve the environment. The Sikes Act Improvement Amendments of 1997 requires that the DOD manage their natural resources while providing a sustained method for the multiple uses of those resources. The Act also requires the development of the Integrated Natural Resources Management Plan (INRMP) document. To guide natural resource management efforts on-installation, Offutt AFB maintains an INRMP, most recently updated in March 2010.

The INRMP was created to ensure long range habitat protection and natural resource management at the installation. The INRMP outlines various natural resources including threatened and endangered species and important habitat, management of noxious weeds, grassland and wildland fire, wildlife and riparian management, water resources and water rights, interagency responsibilities and coordination efforts, and the overall management plan for natural resources at Offutt AFB to ensure no loss of capability for training exercises. The plan utilizes a no-net-loss approach to protect habitat and natural resource quality. This plan receives regular

updates which modify plans and programs to meet the needs of management practices. The plan also provides guidance for interagency cooperation and agreements on management practices at Offutt AFB.

Integrated Cultural Resources Management Plan

DOD Instruction 4715.3 and Air Force Instruction (AFI) 32-7065 require installations to develop an Integrated Cultural Resources Management Plan (ICRMP) as an internal compliance and management tool integrating the entirety of the cultural resources program with ongoing mission activities. As a component of the installation master plan, the ICRMP is the base commander's decision document for conducting cultural resources management actions and specific compliance procedures. It also allows for ready identification of potential conflicts between the US Air Force mission and cultural resources, and identifies compliance actions necessary to maintain the availability of mission-essential properties and acreage.

4.4 State of Nebraska Plans and Programs

Vacant Buildings and Excess Land; State Building Division

All military state-owned property shall be sold to best benefit the State of Nebraska. After public advertisement of the property sale, the county in which the property is located is to send the proceeds from the property sale to the Vacant Building and Excess Land Cash Fund to the General Fund by the State Building Administrator.

Real Estate Disclosures

Real estate disclosures are used in some Nebraska jurisdictions to notify potential homebuyers of conditions affecting the property that they should be aware prior to its purchase. Real estate disclosures are to be provided to the purchaser on or before the effective date of the contract binding the purchaser to purchase the property.

Zoning Exercise of Powers

During the adoption or amendment of a zoning ordinance or an approval of a platting/replatting of a development, the city must notify any military installation within a city's boundary limits or extraterritorial zoning jurisdiction. All notifications shall be delivered by the planning board to the military installation, at least ten days before the proposal meeting.

State Land Use Policy and Control

The State of Nebraska in 1976 granted individual counties and municipalities' authority to develop comprehensive plans and zoning regulations. Local jurisdictions are able to limit agricultural uses in surrounding rural areas. Additionally, zoning regulations can include control of subdivisions from one to three miles beyond the boundary. These policies allow for compatible jurisdictions to be developed between cities, while limiting sprawl outside of urban areas.

This plan shall include the general plan for improvement and developments for the cities and counties. The comprehensive plan among other things shall also include land use patterns and intensity of the proposed general distribution.

Extraterritorial Jurisdictions of Municipalities

An Extraterritorial Jurisdiction (ETJ) of a municipality designates the area beyond the municipality's boundaries for future growth. The governing body of a city, town, or village may request for an ETJ of land that is located within three miles of its corporate boundaries if it is classified as a metropolitan city (City of Omaha), two miles of its corporate boundaries if it is designated as first class city and one mile from the corporate boundaries if it is designated as second class city. A metropolitan class city, as defined by the Nebraska Legislature, is one that has more than 100,000 inhabitants. Cities of the first class are all cities having more than five thousand and not more than one hundred thousand inhabitants. Cities of second class are cities, towns, and villages containing more than eight hundred and not more than five thousand inhabitants. Inhabitant numbers must be ascertained and

officially promulgated by the United States or under the authority of the State of Nebraska or by the authority of the mayor and city council of any such city. Nebraska law allows cities to regulate land uses and implement zoning within their ETJ, allowing them to manage growth within the ETJ.

State of Nebraska Hazard Mitigation Plan

The State of Nebraska Hazard Mitigation Plan establishes guidelines and procedures for hazardous responses. The plan identifies the potential risks that could occur and develops a mitigation process by coordinating with multiple governmental units, including the military department and US Army Corps of Engineers.

This is important for Offutt AFB because it allows for coordination with state and other governmental units on the mitigations to protect Nebraska communities from future impacts.

4.5 State of Nebraska Departments

The state tools provide further assistance and protection of land uses in the State of Nebraska. The tools authorize or mandate local counties and cities to provide for the protection of the state's valuable industries including the DOD and agriculture. In addition, the state's tools require communities and developers to protect and preserve the state's natural resources, including land and water by establishing further regulatory measures to ensure the natural environment is preserved and protected from over-consumptive practices.

Nebraska Department of Environmental Quality

The Nebraska Department of Environmental Quality (NDEQ) was established after the Nebraska Environmental Protection Agency Act in 1971. The NDEQ allows for natural resource management guidance for Offutt AFB and provides planning requirements for air, water, and waste management. The NDEQ works with installations and communities to provide environmental compliance.

Nebraska Forest Service

The Nebraska Forest Service (NFS) was established due to the need for forest protection and care. The NFS provides guidance for tree harvesting and wildfire prevention throughout Nebraska. The NFS established the Forest Stewardship Management Plan. The plan provides assistance by developing comprehensive plans for landowners on how to manage the forests near or on their properties.

Nebraska Department of Natural Resources

The Nebraska Department of Natural Resources (NDNR) provides guidance to balance the demands of natural resources and assesses the impacts for multiple governmental units on topics such as water planning and integrated management, surface water, groundwater, floodplain management, dam safety, field offices, compacts, decrees and interstate water agreements, and natural resources.

Nebraska Department of Roads

The State of Nebraska Department of Roads (NDOR) provides efficient statewide transportation systems for the citizens of Nebraska. Efforts of the department include managing and regulating the state's transportation systems by enforcing federal laws and regulations, and developing policies to further ensure the safety of the public.

4.6 State of Nebraska Local Jurisdiction Planning Tools

The planning tools used by the JLUS Study Area jurisdictions were analyzed and categorized as permanent, semi-permanent, or conditional. In Nebraska, as in many other states, cities and counties may exercise land use and development regulatory authority. Cities and counties are legally bound by statute to adopt general plans.

Comprehensive Plans and Master Plans

In 1967, the State of Nebraska granted individual counties and municipality's authority to develop comprehensive plans and zoning regulations. A comprehensive plan / master plan is a document to guide long range development plans of jurisdiction and its future growth. These planning documents provide goals and visions for the jurisdiction to grow and address economic development, land use, future population growth, community image, transportation, infrastructure, and community facilities. Comprehensive / master plans are considered semi-permanent planning tools because they can be amended and may cause a change in goals or policies.

Zoning Ordinances / Regulations

The purpose of the zoning ordinance is to serve the general welfare, safety, and health of the city and its residents and to recognize specific, sustainable, and compatible uses for areas within its jurisdiction. In order to be effective in accomplishing the jurisdiction's goals and visions, a zoning ordinance / regulation should coincide with the adopted comprehensive plan. Zoning ordinances / regulation are considered semi-permanent planning tools because they can be amended and lands can change their zoning designation if they go through the proper process.

Subdivision Regulations

Subdivision regulations outline requirements to implement functional streets, and to provide the community with sufficient lot sizes and open space, while conforming with the comprehensive plan to develop land in an orderly manner.

While subdivision regulations typically define the standards, procedures, and other requirements for land division, they can also help to prevent or limit future encroachment into an installation or adjacent operational areas by specifying allowable types of infrastructure improvements associated with a subdivision, such as street lights. Subdivision regulations can be used as a foundation to ensure mission sustainability, particularly with dark sky provisions and development density.

Subdivision regulations are considered semi-permanent planning tools because such regulations provide the regulatory foundation for land division only and can be amended at any time by the state or the local jurisdiction.

Building Codes

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

Annexation

Limits of a city are to be determined by the council of that city, and at any time, may extend the limits as deemed necessary for future growth. The city council must provide the general plan with information stating the need for the proposed annexation and its land use.

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

- apply zoning ordinances,
- apply building permit requirements,

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

Table 4-1 provides an overview of existing planning tools by jurisdiction, both in Nebraska and in Iowa, and an assessment of their applicability to military compatibility.

4.7 Cass County

Cass County is located south of Offutt AFB in the State of Nebraska. Plattsmouth is the largest city and County Seat. Cass County does not have any jurisdictional control or land adjacent to Offutt AFB and the majority of Offutt AFB's footprints do not go into Cass County. While it is important to avoid future impacts to Offutt AFB through planning, due to the distance from operational areas, Cass County's planning documents may be less influenced by Offutt AFB operations and may have less impact on base operations.

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

- Cass County Comprehensive Plan
- Cass County Zoning Ordninance
- Cass County Subdivision Regulations
- Cass County Building Code

Comprehensive Plan

Cass County's Comprehensive Plan was adopted in 1998. The plan contains elements such as land use, extraterritorial jurisdictions, infrastructure, housing, populations, economic development, and technology. It is important for Cass County to recognize future development in regards to Offutt AFB by implementing encroachment land use policies and goals.

The following Comprehensive Plan objective relates to military compatibility with Offutt AFB:

> *2. Improve communication and representation throughout Cass County by implementing a communication's program.*

Cass County Land use objectives state the need to identify and estimate future demands for the various land uses and determine policies to:

- protect and enhance current and future uses,
- provide alternatives for land uses, and
- promote efficient use of facilities and utilities.

Table 4-1. City and County Planning Tools

Jurisdiction	Planning Tools								
	General Plan	Zoning Code Height Restrictions	Zoning Code Dark Sky	Zoning Code Sound Attenuation	Airport Land Use Compatibility Plan	Subdivision Regulations	Special / Specific Area Plans	Building Code	Annexation (Extraterritorial Jurisdiction)
Cass County	■	■	■	■	■	■	■	■	■
Douglas County	■	■	■	■	■	■	■	■	■
Mills County	■	■	■	■	■	■	■	■	■
Pottawattamie County	■	■	■	■	■	■	■	■	■
Sarpy County	■	■	■	■	■	■	■	■	■
City of Bellevue	■	■	■	■	■	■	■	■	■
City of Council Bluffs	■	■	■	■	■	■	■	■	■
City of Glenwood	❖	❖	■	❖	■	❖	■	❖	❖
City of La Vista	■	■	■	■	■	■	■	■	■
City of Omaha	■	■	■	■	■	■	■	■	■
City of Plattsmouth	■	■	■	■	■	■	■	■	■

Legend: ■ = The tool exists but does not address land use issue(s) related to military compatibility. ■ = The tool exists but only partially addresses land use issue(s) related to military compatibility. ■ =The jurisdiction does not employ this tool. ■ = The tool exists and addresses land use issue(s) related to military compatibility. ❖ = Tool was unavailable for review at the time the JLUS was written.

The comprehensive plan states that if any proposed development is not supported by the plan's objectives then modifications to the plan should be implemented. The following criterion has been determined to indirectly assist military compatibility when evaluating the comprehensive plans goals and objectives:

1. The character of the adjacent neighborhood

2. The zoning and uses on nearby properties

3. The suitability of the property for the uses allowed under the current zoning designation

4. The type and extent of positive or detrimental impact that may affect adjacent properties, or the county at large, if the request is approved

5. The impact of the proposal on public utilities and facilities

and

8. Comparison between the existing land use plan and the proposed change regarding the relative conformance to the goals and policies

9. Consideration of professional staff recommendations

The comprehensive plan does not state any land use regulations regarding military installations directly. It does state that in any case for new development, buffers or added setbacks from existing land uses should be implemented. This plan is outdated and it is recommended that Cass County update their comprehensive plan to include encroachment policies to further protect Offutt AFB's operations.

Zoning Ordinance

Zoning ordinances have been amended through 2012. The zoning ordinance divides the land within the county into 12 districts, and provides development regulations for these districts. Cass County's zoning plan does include a stand-alone district for airports.

Cass County has established an Airport Approach Zone District that will be overlaid to any primary zoning district under approach and departure zones for all heliports, and airports, that extend three miles out from the adjacent boundaries of the airport. Height limits are required for Inner, Outer, Transitional, and Operational zones within the Airport Approach District.

The following compatibility concerns are based on a review of the zoning provisions:

- The topics of noise, vibration, and lighting associated with compatibility to the military activitites are not addressed in the ordinance.
- There are no provisions for airport safety zones, accident potential zones, or other hazard areas that may be associated with military activities and airfields.
- The approval process does not require a real estate disclosure to future property owners purchasing property that may be subject to the effects of military operations.

Article 5 details district standards and permitted uses for the 12 districts within the county. Most residential uses have a maximum height of 35 feet, districts R-2, REC/AG, AG-1, TA-1 have permitted and conditional uses that exceed the maximum height to 65 feet. Large wind energy systems are permitted within AG, Trans/AG districts with a conditional use permit. Small wind energy systems are permitted with a conditional use permit in all districts except REC/AG. Maximum heights of the structures are permitted up to 80 feet.

Although these districts are within a given distance from Offutt AFB, the county should recognize incompatible heights within districts in relation to Offutt AFB.

Subdivision Regulations

The following compatibility concerns are based on a review of the subdivision regulations:

- The Cass County Subdivision Regulations do not include specific direction that would protect Offutt AFB and mission critical activities from encroachment.

Building Regulations

Cass County has adopted the following building codes:

- 2006 International Building Code
- 2006 National Electric Code
- 2006 National Plumbing Code
- 2006 Uniform Building Code

4.8 City of Plattsmouth

The City of Plattsmouth is the county seat and largest city in Cass County. Plattsmouth is located south of Offutt AFB and does not have any jurisdictional control or land adjacent to Offutt AFB and the majority of Offutt AFB's footprints do not go into the city. While it is important to avoid future impacts to Offutt AFB through planning, due to the distance from operational areas, Plattsmouth's planning documents may be less influenced by Offutt AFB operations and may have less impact on base operations.

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

- City of Plattsmouth Comprehensive Plan
- City of Plattsmouth Zoning Ordinance
- City of Plattsmouth Subdivision Regulations
- City of Plattsmouth Building Code

Comprehensive Plan

The 2004 comprehensive plan contains elements outlining the community vision, issues and opportunities, policies and implementation program. However, the following growth and land use goals were found to indirectly help Offutt AFB:

> *Provide adequate land for projected and potential growth and provide infrastructure investments that correspond to the community's growth potential.Maintain development patterns in lower-density areas to conserve the natural landscape and preserve long-term growth prerogatives.*
>
> *Preserve open space, farmland, and critical environmental areas.*
>
> *Establish a process that encourages collaboration among all stakeholders.*
>
> *Institute a development review process that encourages, rather than obstructs, innovative development.*

The following land use goal was noted relevant to military compatibility:

> *4. Protect the airport flight path from future development.*

Additionally, Plattsmouth has implemented an annexation policy stating:

> *Plattsmouth should implement an annexation policy incorporating areas that are experiencing development, that meet state statutory requirements as urban in nature, and that meet one or more criteria for incorporation into the city. The city should work with Cass County to ensure consistent*

development standards for areas currently outside of Plattsmouth's jurisdiction but likely to be incorporated into the planning area during the next twenty years.

All of these goals and policies for the city's future land use are good compatibility tools. The plan does not address the military presence from a land use compatibility standpoint.

Zoning Ordinance

The zoning ordinance divides the land within the city into 13 base districts and 7 overlay districts. Article four describes the regulations and permitted uses for each district.

Lighting within the city is regulated to stay at a low-level and be directed so that no glare impacts adjacent areas. The ordinance also states an Aviation Overlay District (AV), which includes operation zones, approach zones, inner area for each approach zone, transition zone and turning zone. No building, transmission / communication line, pole, tree, tower, or other structures shall be allowed in the following areas:

A. In Inner areas of Approach Zones to a height above the elevation of the nearest point on the end or proposed end of said instrument runway or landing strip in excess of 1/50, and all other runways or landing strips in excess of 1/40 of the distance from the end of the Approach Zone (the end nearest the runway or landing strip) to said structure or object;

B. In the Outer Area of Approach Zones and in Turning Zones to a height in excess of 150 feet above the elevation at the end of the nearest runway or landing strip;

C. In the Transition Zones to a height above the planes forming the transition slopes; and

D. In the existing or proposed Operation Zones to a height above the existing or proposed finished grade of said runway or landing strips or surface of the ground.

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

- Lighting height standards are permitted to 35 feet unless the City grants an expception
- Communication towers and alternative energy production devices uses are permitted by special use permits within AG and RR districts, which could interfere with Offutt AFB flight operations.
- Maximum heights for wind energy conservation systems are able to exceed 50 percent of the permitted districts height limit.
- Zoning districts AG, R3, UC, and GC have maximum heights ranging from 36 to 100. Zoning district CB with a special use permit has no set height limit. Zoning districts HI and GI have a maximum height limit of 72.
- The zoning ordinance does not provide sound attenuation standards to further protect the community from military operations.

Under Height exceptions 7-3, the zoning ordinance states that any structure within a district that is bounded by FAA regulations may not exceed the existing permitted heights. Structures that are able to exceed 35 feet in height have the potential, if within proximity of Offutt AFB, to have impacts on flight and missions.

Subdivision Ordinance

Under general guidelines for subdivisions, the following performance objective was found relative with military compatibility:

> *Mitigation of negative environmental effects on surrounding properties, including effects of shadow, noise, odor, traffic, drainage, and utilities.*

Noise and lighting mitigation efforts help protect local communities from the effects of outside sources.

A review of the subdivision regulations has identified the following concerns related to military compatibility:

- Preservation and maintenance of buffer areas are to minimize conflicts between residential and agricultural uses only.

Building Regulations

The City of Plattsmouth has adopted the following building codes:

- 2009 International Building Code
- 2009 International Electric Code
- 2009 International Mechanical Code
- 2009 International Plumbing Code
- 2009 International Fuel Gas Code
- 2009 International Fire Code
- 2009 International Private Sewage Disposal Code
- 2009 International Property Maintenance Code
- 2009 International Residential Code
- 2009 International Existing Buildiing Code

4.9 Douglas County

Douglas County is located north of Offutt AFB in the State of Nebraska. Omaha is its largest city and County Seat. Douglas County does not have any jurisdictional control or land adjacent to Offutt AFB and the majority of Offutt AFB's footprints do not go into Douglas County. While it is important to avoid future impacts to Offutt AFB through planning, due to the distance from operational areas, Douglas County's planning documents may be less influenced by Offutt AFB operations and may have less impact on base operations.

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

- Douglas County Comprehensive Plan
- Douglas County Zoning Regulations
- Douglas County Subdivision Regulations
- Douglas County Building Code

Comprehensive Plan

Updated in 2006, the plan covers an array of topics, including land use trends, environmental and development resources, stakeholder issues, land use principles, transportation, and infrastructure. Douglas County values the protection of the natural environment and cultural activities that take place among the communities.

The first principles were developed from committees and community input and provide guidance for future land use. A review of the comprehensive plan has identified the following related indirectly to military compatibility:

- The plan calls for permitted densities to be consistent with the land use categories established in the future land use plan.
- It states that new subdivision applications are to be circulated for review and comments by public service providers.
- The plan identifies a need to develop new language for conservation development, planned developments, and use of best stormwater management practices.
- The plan calls for the use of best management practices (BMPs) in subdivision development design.

Additionally the county states that to avoid future land use conflicts with surrounding counties and the City of Omaha, inter-local cooperation agreements will be established to guide rural development that have the potential to impact extra-territorial jurisdictions.

Zoning Regulations

The zoning regulation divides the land within the county into 12 zoning districts and 4 overlay districts.

The purpose of the regulation is to promote safe general welfare for the community, and provide adequate living standards, so as to prevent incompatible development of land. The following compatibility concerns are based on a review of the zoning provisions:

- The height of a Wind Energy Conservation System (WECS) may be 50 percent higher than the zoning districts height restriction.

Subdivision Regulations

The unincorporated areas of Douglas County that the county has jurisdiciton over are far north of Offutt AFB and are unlikely to be heavily impacted by operations at Offutt AFB. Therefore, subdivision regulations for Douglas County do not need to address compatibility with Offutt AFB.

Building Regulations

Douglas County has adopted the following building codes:

- 2006 International Residential Building Code (As amended by the City of Omaha)
- 2006 Commercial Building Code
- 2014 National Electrical Code
- 2009 International Energy Conservation Code
- 2006 Mechanical Code (As amended by the City of Omaha)
- 2007 Plumbing Code
- State Fire Code
- State Handicap Code

4.10 City of Omaha

The City of Omaha is located in Douglas County, north of Offutt AFB. Omaha is the largest city in not only Douglas County but the State of Nebraska. Omaha does not have any jurisdictional control or land adjacent to Offutt AFB and the majority of Offutt AFB's footprints do not go into the city. While it is important to avoid future impacts to Offutt AFB through planning, due to the distance from operational areas, Omaha's planning documents may be less influenced by Offutt AFB operations and may have less impact on base operations.

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

- City of Omaha Master Plan
- City of Omaha Zoning Ordinance
- City of Omaha Subdivision Regulations
- City of Omaha Building Regulations

Master Plan

The City of Omaha's master plan does not directly call out compatibility with Offutt AFB. However, there are numerous objectives that indirectly could be used to promote compatibility with Offutt AFB. The following objectives from the Environmental Element address issues that the City of Omaha has recognized:

> *Accoustical Environment Objective 1.1. – Review and improve guidelines for reducing noise impacts in land use planning, in evaluating the relationship of land uses, and in the design of mixed-use developments.*
>
> *Land Objective 1.4. – Develop mechanisms to protect and preserve sensitive areas and unique ecological, cultural or aesthetic features (e.g., by way of legislation, zoning overlays, acquisition plans, coordination with other government agencies and NGO's [non-governmental organizations]).*
>
> *Visual Resources Objective 2.3. – Work with interested entities to evaluate the potential visual and auditory impacts of alternative energy system equipment and structures, and establish guidelines that promote their use while minimizing conflicts with both neighboring properties and public views.*
>
> *Visual Resources Objective 3. – Adopt and promote standards for the appropriate use of lighting to enhance aesthetics and safety while allowing views of the night sky.*
>
> *Building Sites – Residential / Non-Residential Objective 9. – Minimize off-site environmental impacts associated with dust, erosion, siltation, odors, light and noise.*

The following items concerning military compatibility are based on a review of the master plan:

- The plan does not address the military presence from a land use compatibility perspective.

Zoning Ordinance

The zoning regulation divides the land within the city into 26 zoning districts and 10 overlay districts. Article four describes the regulations and permitted uses for each district.

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

- Maximum heights for the zoning districts Community Commercial (CC), Neighborhood Business District (NBD), and General Comercial (GC) range from 60 to 76 feet, General Office (GO), General Industrial (GI), and Heavy Industrial (HI) with a maximum height of 120 feet, and zoning district High-Density Multiple-Family Residential (R8) exceeding to 150 feet may cause incompatible development and cause potential impacts to Offutt AFB and its missions.
- There are no provisions related to military compatibility, e.g., noise, lighting, vibration, or height.

Subdivision Regulations

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

- Subdivision regulations do not offer incentives for desired development near military installations.
- The subdivision regulations do not require disclosure to buyers of the potential effects of being located near a military facility.
- The regulations do not require the delineation of noise contours, where applicable.

Building Regulations

The City of Omaha has adopted the following building regulations:

- 2006 International Residential Building Code (Ammended by the City of Omaha)
- 2006 International Commercial Building Code
- 2014 National Electrical Code
- 2009 International Energy Conservation Code
- 2006 International Mechanical Code
- 2010 Omaha Plumbing Code
- 2006 Accessibility Code

4.11 Sarpy County

Sarpy County is home to Offutt AFB. Sarpy County has an approximate area of 247 square miles and has a population of 158,840. The following is a review of the existing planning tools utilized by Sarpy County along with a brief analysis identifying their efficiency in addressing land use and military compatibility and where potential improvements can be made. The following planning tools were evaluated:

- Sarpy County Comprehensive Plan
- Sarpy County Zoning Regulations
- Sarpy County Subdivision Regulations
- Sarpy County Building Regulations

Sarpy County is currently undergoing updates to its comprehensive plan, zoning regulations, and subdivision regulations and intends to include recommendations from the JLUS into its updated plans to promote compatibility between the County and Offutt AFB.

Comprehensive Plan

The 2005 Sarpy County Plan includes a vision for Land Use, Transportation, Water and Sewer Services, and Public Facilities. The Plan includes only a small amount of information directly related to Offutt AFB. One of the few times Offutt AFB and development-related topics is mentioned is in regards to floodplains and floodways of the Papillion Creek; stating that development in this area would not be feasible even without flood concerns because of the location within the Offutt AFB Clear Zone.

the Basic Plan Principles do not directly state compatibility with Offutt AFB but can be read to offer the base certain protections from incompatible development. Some examples include the following:

> *Principle 4: The development outcome of various areas of the county will be determined by the interaction of four variables: environmental suitability, feasibility and relative costs and benefits of providing urban services, market demand, and the future plans and development policies of the county's municipalities.*
>
> *Municipal Policy: Phased development in Sarpy County will be sensitive the [sic] the needs and development policies of the county's municipalities. Investment or initiatives that redirect growth from areas within city jurisdictions to noncontiguous areas will be avoided or deferred to their appropriate time.*

While neither of these examples mentions Offutt AFB, municipal plans could be written to guide development away from areas that may adversely affect Offutt AFB. However, without direct language to help protect Offutt AFB from incompatible development, the topic may be overlooked.

Zoning Regulations

The zoning regulation divides the land within the county into 20 zoning districts and 2 overlay districts. The Sarpy County Zoning Regulations do not directly call out compatibility with Offutt AFB or military uses. However, the Regulations do contain numerous sections that indirectly help promote compatibility with Offutt AFB.

Sarpy County has established an Airport Approach Zone District that will be overlaid to any primary zoning district under approach and departure zones for all heliports, airports, or airfields. Height limits within the Airport Approach Zone District is required to meet the latest federal and state regulations regarding height in airport approach areas. Performance Standards in the Airport Approach Zone District prevent the Director of Planning from approving any land uses that will:

> *27.6.1 Create large public assemblies*
>
> *27.6.2 Release into the air any substance which would impair visibility, such as steam, dust and smoke – except smoke from existing heating plants, incinerators, and fireplaces.*
>
> *27.6.3 Create light emissions that interfere with aircraft communications systems or navigational equipment.*
>
> *27.6.4 Create electrical emissions that interfere with aircraft communications systems or navigational equipment.*
>
> *27.6.5 Allow the dumping of garbage or maintenance of feeding stations or facilities which are attractive to birds.*
>
> *27.6.6 Not comply with the clearance, smoke, light and electronic emission requirements and are for uses not compatible with airfield operations.*

Regulations like this help to protect the immediate area around the base from incompatible development.

Height Regulations are important to protect flight operations in areas at distances further from the base. Height Regulations in Sarpy County are required for most land use types and all permitted heights are limited to a height of less than 100 feet. For certain uses that may require additional height, the regulations state the following:

> *35.5.3 Certain uses may require additional height on a case by case basis. A special use permit may be granted to increase the height of hotels/motels, recreational facilities, hospitals, wind energy generation systems, and civic uses.*

However, height regulations do not apply to church spires, belfries, monuments, farm buildings, flag poles, tanks, grain storage bins, elevator legs, silos, water and fire towers, stage towers, or scenery lofts.

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

- Offutt AFB is not recognized within the county's zoning code.

Subdivision Regulations

Sarpy County's Subdivision Regulations were adopted in 2013 and require compliance with all zoning regulations and consistency with the Comprehensive Plan. A review of the subdivision regulations has identified the following related to military compatibility:

- The approval process does not require notification to future property owners purchasing land in a subdivision that may be impacted by noise and vibration.
- The regulation does not require the delineation of noise contours, where applicable.

Building Regulations

Sarpy County has adopted the following building codes:

- 2006 International Building Code
- 2006 International Residential Code
- 2006 International Plumbing Code
- 2006 International Mechanical Code
- 2009 International Energy Conservation Code
- 2014 National Electrical Code

4.12 City of Bellevue

The City of Bellevue is located in Sarpy County and is adjacent to Offutt AFB.

Bellevue utilizes numerous tools that can help to further military compatibility. The tools discussed are as follows:

- City of Bellevue Comprehensive Plan
- City of Bellevue Zoning Ordinance
- City of Bellevue Subdivision Regulations
- City of Bellevue Building Code

Comprehensive Plan

Bellevue's location immediately adjacent to Offutt AFB allows the city increased opportunities to help protect military compatibility. The Bellevue Comprehensive Plan includes a short term goal that seeks to protect Offutt AFB from incompatible development.

> *Make the AICUZ an asset to the community (i.e. open space, linear park connecting to other park and trail systems) while protecting Offutt Air Force Base from encroachment from development.*

This goal helps to protect the Offutt AFB APZs. The APZs are very important as development in these areas could prevent Offutt AFB from carrying out missions and could increase safety risks to the public.

Additionally the plan states the need for Flexible-Space Districts. This is to promote land uses that are more compatible with their adjacent areas. Areas near Offutt AFB that are considered for flexible-space zoning include Kennedy Freeway, Capehart Road, north, southwest, and southeast corners of Fairview Road, and Fort Crook Road. The following compatbility issues are based on a review of the comprehensive plan:

> *Offutt AFB Housing District lacks diversity in styles, ultimately leaving military personnel to look elsewhere for housing.*

Zoning Ordinance

The City of Bellevue's Zoning Ordinance was updated in 2011 and divides the land within the city into 20 zoning districts and nine overlay districts. The zoning ordinance states compatible land uses within the AICUZ areas include the CZ, APZ I and II, Noise Zones, and Height and Obstruction criteria for the Overlay Districts. The following statements are implemented to:

> *Reduce the risk to public health, safety, and quality of life due to aircraft noise exposure and accident potential.*
>
> *Promote compatible land development in areas surrounding a military airfield by regulating land uses and establishing criteria for the regulation of building height and density.*
>
> *Preserve the operational capabilities and mission of Offutt Air Force Base and to prohibit uses which create potential hazards to the safe approach and departure of aircraft.*
>
> *Address potentially life threatening situations in areas exposed to aircraft accident potential through restrictions on the congregation of large numbers of people or high concentrations of people and by restrictions on*

concentrations of people who are unable to respond to emergency situations such as children, elderly, handicapped, and persons undergoing medical treatment.

Increase the protection of persons exposed to high levels of aircraft noise by requiring acoustical treatment in buildings located within these areas and regulating those uses which are sensitive to such noise.

It is also requires that the Base Civil Engineer at Offutt AFB be notified of development in order to maintain compliance with the AICUZ, and any development within the related area must conform to the FAA Part 77 height restrictions.

Section 5.29 of the City of Bellevue Zoning Ordinance is established as the AICUZ Overlay District, which provides recommendations to communities for land uses in the APZs and the noise zones. The ordinance clearly adopts the 1992 AICUZ Report recommended land use table for safety and noise. The ordinance applies to new development and any change, expansion, or addition of an existing structure or property. Any development in the overlay requires a separate development permit. It is important to note too that the City of Bellevue has continued to use the larger 1992 AICUZ contours to maintain compatibility should the opportunity for new missions be evident.

The most recent Offutt AFB AICUZ Report was approved in 2007; however, for planning purposes, Offutt AFB and the City of Bellevue use the 1992 noise contours because they are larger than the 2007 AICUZ contours and provide for a larger area to address compatibility in case the contours increase in size in the future. The only issue with this ordinance is that the DOD has updated their instructions for AICUZ programs as of 2015. These AICUZ recommendations from the 1992 Offutt AFB AICUZ report may be outdated and could be inconsistent with 2015 recommendations.

Additionally, the ordinance states the need for lighting to be implemented as to not glow onto an adjacent property within the Parking Overlay (PO), Heavy Neighborhoods Business (BNH), General Business (BG), Metropolitan General Business (BGM), and Heavy General Business (BGH) zones, with the exception of a conditional use permit in Flex Space (FX) zones.

Subdivision Regulations

The purpose of Bellevue's Subdivision Regulations is to provide compatible development to the surrounding areas, implement standards that are outlined within the comprehensive plan, and create coordination for the safety and convenience of the residents. The following compatibility issues are based on a review of the subdivision regulations:

- Sketch Plat / Preliminary Plat / Final Plat requirements do not require the delineation of noise contours, where applicable.
- No real estate disclosures are required for future property owners.

Building Regulations

The City of Bellevue has adopted the following building codes for within their jurisdiction and two mile ETJ:

- 2009 International Building Code
- 2009 International Residential Code
- 2009 Uniform Plumbing Code
- 2009 International Mechanical Code
- 2009 International Fuel Code
- 2011 National Electrical Code
- 1997 Uniform Administrative Code
- City of Bellevue Amendments

4.13 City of La Vista

La Vista is an incorporated city in Sarpy County, located northwest of Offutt AFB. La Vista does not have any jurisdictional control or land adjacent to Offutt AFB and the majority of Offutt AFB's footprints do not go into the city. While it is important to avoid future impacts to Offutt AFB through planning, due to the distance from operational areas, La Vista's planning documents may be less influenced by Offutt AFB operations and may have less impact on base operations.

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

- City of La Vista Comprehensive Plan
- City of La Vista Zoning Ordinance
- City of La Vista Subdivision Regulations
- City of La Vista Building Code

Comprehensive Plan

The City of La Vista Comprehensive Plan was last updated in 1991. The following general community goals were found to be indirectly geared towards compatible development:

> *5. Stabilize and broaden the economic base to create and expand employment opportunities for all age categories. Establish an annual La Vista Visioning Program to focus on the annual creation of business and industrial types most appropriate for the community.*
>
> *7. Strengthen relations with neighboring communities by teaming together to create a "quality of life initiative" to address the many needs, desires and activities of all segments of the population in and around the La Vista area.*

Land use policies that are stated within the plan, even though there is no language recognizing Offutt AFB, can be used in regards to compatible development.

> *(1) Provide opportunities for community development in an orderly and efficient manner in all areas of La Vista.*
>
> *(2) Establish and maintain land use development patterns and densities, that best conform with the desires and needs of the residents.*
>
> *(3) Encourage compatible land uses, during the planning and implementation of development activities that are also cognizant of land uses in adjacent communities.*
>
> *(4) Encourage land use patterns which preserve and protect the unique natural features and resources of the community from adverse development.*

The following economic development and employment action policies that are relative to compatible development identify the need to:

> *15. Promote economic growth and development activities on a county basis with adjacent communities.*
>
> *16. Continue and improve working relationships with regional and state offices to promote economic development.*

The following items concerning military compatibility are based on a review of the comprehensive plan:

- The plan does not address the military presence from a land use compatibility perspective.
- The comprehensive plan promotes land uses that are to be free of air, water, and noise pollution. These areas have the potential to be incompatible if within proximity to Offutt AFB air operations.

Zoning Ordinance

The Zoning Ordinance for the City of La Vista was updated in 2012 and divides the land within the city into 12 districts and 2 overlay districts. The regulations do not directly recognize compatibility with Offutt AFB or any military uses.

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

- Non-conforming land use development is able to continue if found lawful.
- The city refers to a list of permitted uses within each zoning district rather than using performance standards.
- Wind energy systems are allowed in any zoning district with a conditional use permit.
- The height of wind energy conversion systems is not determined.

Subdivision Regulations

The City of La Vista Subdivision Regulations were adopted in 2014. A review of the subdivision and land development regulations has identified the following related to military compatibility:

- The subdivision regulations do not include any provisions related to military compatibility, e.g., airport, noise, lighting, vibration, or height.
- The approval process does not require notification to future property owners purchasing land in a subdivision that may be subject to the effects of military or airport operations such as noise and vibration.

Building Regulations

The City of La Vista has adopted the following 2006 international codes and 2008 national code for within their jurisdiction:

- 2006 International Building Code
- 2006 International Residential Code
- 2006 International Plumbing Code
- 2006 International Mechanical Code
- 2006 International Fuel Gas Code
- 2006 International Energy Conservation Code
- 2008 National Electric Code

4.14 City of Papillion

The City of Papillion is an incorporated city in Sarpy County, located northwest of Offutt AFB. Papillion does not have any jurisdictional control or land adjacent to Offutt AFB and the majority of Offutt AFB's footprints do not go into the city. While it is important to avoid future impacts to Offutt AFB through planning, due to the distance from operational areas, Papillion's planning documents may be less influenced by Offutt AFB operations and may have less impact on base operations.

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

- City of Papillion Comprehensive Plan
- City of Papillion Zoning Regulations
- City of Papillion Subdivision Regulations
- City of Papillion Buidling Code

Comprehensive Plan

The following land use policies are stated within the plan, even though there is no language recognizing Offutt AFB, the policies can be used in regards to compatible development.

> *Develop as a unified community that provides a framework for growth.*
>
> *Provide adequate land for projected and potential growth.*

Assure that new development creates the greatest advantages for building the community.

Other compatibility regulations include criteria and framework standards for land uses relating to low-density residential development. These land uses are to be insulated from environmental impacts such as noise, smell, and pollution.

The following items concerning military compatibility are based on a review of the comprehensive plan:

- The plan does not address the military presence from a land use compatibility perspective.
- There are no lighting, frequency, or vibration provisions associated with compatibility of the Offutt AFB mission in the plan.

Zoning Regulations

The zoning regulations divide the land within the city into 14 districts and 8 overlay districts. The regulations do not directly recognize compatibility with Offutt AFB or any military uses.

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

- Non-conforming land use development is permitted to continue if found lawful.
- The height of wind energy conversion systems has the potential to exceed the established maximum height if granted an exception through a special use permit.
- Building height exceptions allowed by other permitted uses in Limited Commercial (LC), Single-Family Residential (Low-Density)(R-1), Single-Family Residential (Medium-Density)(R-2), Urban Family Residential (R-3), Multiple-Family Residential (R-4), Mobile Home Residential (MH), and the Office (O) districts.
- Height restrictions from 35 to 100 feet are applicable in Rural Residential Estates (RE), Agriculture (AG), R-1, R-2, R-3, R-4, MH, O, LC, Community Commercial (CC), General Commercial (GC), Limited Industrial (LI), and General Industrial (GI) districts. CBD zoning district does not have a height limit. These heights have the potential, if within proximity to Offutt AFB, to cause incompatible development which may impact the installation's mission.

Subdivision Regulations

A review of the subdivision and land development regulations has identified the following related to military compatibility:

- The City of Papillion Subdivision Regulations do not include specific direction that would protect Offutt AFB and mission critical activities from encroachment.
- The approval process does not require real estate disclosures for future property owners.

Building Regulations

The City Papillion has adopted the following building codes for within their jurisdiction:

- 2006 International Building Code
- 2006 International Residential Code
- 2006 International Plumbing Code
- 2006 International Mechanical Code
- 2006 International Fuel Gas Code
- 2006 International Energy Conservation Code
- 2012 International Fire Code
- 2011 National Electrical Code
- 2000 National Fire Protection Association Life Safety Code 101

4.15 State of Iowa Plans and Programs

Real Estate Disclosures

Real estate disclosures are used in some Iowa jurisdictions to notify potential homebuyers of conditions affecting the property that they should be aware prior to its purchase. Real estate disclosures are to be provided to the purchaser no later than 10 days after the purchase agreement has been signed by the purchaser.

State Land Use Policy and Control

The State of Iowa granted individual counties and municipalities' authority to develop comprehensive plans and zoning regulations. Local jurisdictions are able to limit agricultural uses in surrounding rural areas. Additionally, zoning regulations can include control of subdivisions from one to three miles beyond the boundary. These policies allow for compatible jurisdictions to be developed between cities, while limiting sprawl outside of urban areas.

This plan shall include the general plan for improvement and developments for the cities and counties. The comprehensive plan among other things shall also include land use patterns and intensity of the proposed general distribution.

Extraterritorial Jurisdictions of Municipalities

An Extraterritorial Jurisdiction (ETJ) of a municipality designates the area beyond the municipality's boundaries for future growth. The governing body of a city, town, or village may request for an ETJ of land that is located within two miles of its corporate boundaries except in areas where a county zoning ordinance exists.

The State of Iowa Hazard Mitigation Plan

The State of Iowa Hazard Mitigation Plan establishes guidelines and procedures for hazardous responses. The plan identifies the potential risks that could occur and develops a mitigation process by coordinating with multiple governmental units, including the military department and US Army Corps of Engineers.

4.16 State of Iowa Departments

The state tools provide further assistance and protection of land uses in the State of Iowa. The tools authorize or mandate local counties and cities to provide for the protection of the state's valuable industries including the DOD and agriculture. In addition, the state's tools require communities and developers to protect and preserve the state's natural resources, including land and water by establishing further regulatory measures to ensure the natural environment is preserved and protected from over-consumptive practices.

Iowa Department of Natural Resources

The Iowa Department of Natural Resources (DNR) provides guidance to balance the demands of natural resources by managing and implementing laws to protect the air, land, and water. The department manages properties and educates Iowa's citizens on environmental conservation to ensure the protection and enhancement of state's natural resources. Additionally, the department provides guidance to multiple governmental units on topics such as water planning and integrated management, surface water, groundwater, floodplain management, dam safety, field offices, compacts, decrees and interstate water agreements, and natural resources.

Iowa Department of Transportation

The Iowa State Department of Transportation provides efficient and convenient transportation services to the citizens of Iowa. Efforts of the department include managing and regulating the state's transportation systems by enforcing federal laws and regulations, and developing policies to further ensure the safety of the public.

4.17 State of Iowa Local Jurisdiction Planning Tools

Comprehensive Plans

A comprehensive plan is a document to guide long range development plans of jurisdiction and its future growth. These planning documents provide goals and visions for the jurisdiction to grow and address economic development, land use, future population growth, community image, transportation, infrastructure, and community facilities. Comprehensive plans are considered semi-permanent planning tools because they can be amended and may cause a change in goals or policies.

Zoning Ordinances / Regulations

The purpose of the zoning ordinance is to serve the general welfare, safety, and health of the city and its residents and to recognize specific, sustainable, and compatible uses for areas within its jurisdiction. In order to be effective in accomplishing the jurisdiction's goals and visions, a zoning ordinance / regulation should coincide with the adopted comprehensive plan. Zoning ordinances / regulation are considered semi-permanent planning tools because they can be amended and lands can change their zoning designation if they go through the proper process.

Subdivision Regulations

Subdivision regulations outline requirements to implement functional streets, and to provide the community with sufficient lot sizes and open space, while conforming with the comprehensive plan to develop land in an orderly manner.

While subdivision regulations typically define the standards, procedures, and other requirements for land division, they can also help to prevent or limit future encroachment into an installation or adjacent operational areas by specifying allowable types of infrastructure improvements associated with a subdivision, such as street lights. Subdivision regulations can be used as a foundation to ensure mission sustainability, particularly with dark sky provisions and development density.

Subdivision regulations are considered semi-permanent planning tools because such regulations provide the regulatory foundation for land division only and can be amended at any time by the state or the local jurisdiction.

Building Codes

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

The building code regulates construction practices to maintain structural integrity and safety and can apply to compatibility with military installations, including necessary sound attenuation for residences within applicable noise zones.

Annexation

Limits of a city are to be determined by the council of that city, and at any time, may extend the limits as deemed necessary for future growth. The city council must provide the general plan with information stating the need for the proposed annexation and its land-use.

4.18 Mills County

Mills County is located east of Offutt AFB in the State of Iowa. Glenwood is the largest city and County Seat of Mills County.

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

- Mill County Comprehensive Plan
- Mills County Zoning Ordinance
- Mills County Buidling Code

Comprehensive Plan

The county's comprehensive plan states basic principles to recognize the environmental resources, agricultural industries, natural features, and land uses that should be developed to preserve the existing and future development. Goals and policies do not directly state compatibility with Offutt AFB but can be read to offer the base certain protections from incompatible development. Some examples include the following:

> *Require special use permits with restricted construction practices for developments in areas identified environmentally sensitive.*
>
> *Within certain projects, areas of unique significance may exist whose preservation should be required through project design.*

While neither of these examples mentions Offutt AFB, county plans could be written to guide development away from areas that may adversely affect Offutt AFB.

A review of the comprehensive plan has identified the following related to military compatibility:

- Does not address land use issues relative to military compatibility.
- There are no lighting, frequency, or vibration provisions associated with compatibility of the Offutt AFB mission in the plan.

Zoning Ordinance

The zoning ordinance divides the land within the county into 8 base districts and 2 overlay districts. The code reflects the Comprehensive Plan and establishes minimum requirements to promote the county's general welfare.

Lighting within the county is specified in section 27.10.5 under Conditions that:

> *Towers shall not be illuminated by artificial means, except if the illumination is specifically required by the FAA or other authority. Any light source utilized for security lighting shall feature down directional, sharp cut-off luminaries, which ensure there is no spillage of illumination off the parcel or easement boundary.*

The county also states the purpose for intensity ratings, which reflect the impact on the specified land uses and adjacent areas. The following intensity ratings are to be incorporated when considering the following:

> *(1) Impacts on the physical environment. These impacts include the potential for air pollution, dust, odors, water pollution, noise, obtrusive lighting, vehicular traffic, impervious surface coverage and storm drainage problems, and other destruction of the natural environment.*
>
> *(2) Impacts on aesthetics and cultural values. These impacts include the likely visual attractiveness of the proposed development, assuming typical buffer yards, landscaping, signage, other site improvements and building materials.*

The following compatibility concerns are based on a review of the zoning provisions:

- Height restrictions from 50 to 200 feet are applicable to Agriculture (AG), Agriculture/Residential (AR), Loess Hills Conservation Development (LH), Greenway/Open Space Conservation (OS), Village (V), Convenience Commercial (C-1), Highway Oriented Commercial (C-2), and Industrial (I) districts.
- nonconforming sturctures existing prior to the effective date of the ordinance are permitted to continue if found lawful.
- Alternative energy production devices are permitted by right within zoning districts AG and AR, and are permitted by a special use permit within districts LH,C-1, and I.

Building Code

Mills County has adopted the following elements as part of its building code:

- Chapter 24 Section 24.2, Iowa Building Code
- Chapter 24 Section 24.3, Iowa Residential Building Code
- Chapter 24 Section 24.4, Iowa Plumbing Code
- Chapter 24 Section 24.5, Iowa Mechanical Code
- Chapter 24 Section 24.6, Iowa Electrical Code
- Chapter 24 Section 24.7, International Fuel Gas Code, 2006 including Appendix A-D
- Chapter 24 Section 24.8, Iowa Energy Conservation Code
- Chapter 24 Section 24.9, Iowa Existing Building Code
- Chapter 24 Section 24.10, Iowa Historic Building Code
- Chapter 24 Section 24.11, International Property Maintenance Code, 2006
- Chapter 24 Section 24.12, Iowa, Demolition of Building and Structures Code
- Chapter 24 Section 24.13, Iowa, Factory Built Structures Code

The following compatibility concerns are based on a review of the building code:

- Mills County building code does not reference sound attenuation for residential building code standards.

4.19 City of Glenwood

The City of Glenwood is the largest city and County Seat of Mills County, Iowa. Glenwood lies southeast of Offutt AFB.

No planning documents from the City of Glenwood were available to review at the time the JLUS was written.

4.20 Pottawattamie County

Pottawattamie County is located northeast of Offutt AFB in the State of Iowa. Council Bluffs is the largest city and County Seat in Pottawattamie County. Pottawattamie County does not have any jurisdictional control or land adjacent to Offutt AFB and the majority of Offutt AFB's footprints do not go into the county. While it is important to avoid future impacts to Offutt AFB through planning, due to the distance from operational areas, Pottawattamie County's planning documents may be less influenced by Offutt AFB operations and may have less impact on base operations.

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

- Pottawattamie County Comprehensive Plan
- Pottawattamie County Code:
    - Zoning
    - Building
    - Subdivisions

Comprehensive Plan

The 2004 update of the Comprehensive Plan contains elements outlining population, economics, and housing, land use, specific county regions, public facilities, and transportation. The guidelines outlined in the general plan are important because of their potential impacts on operations at Offutt AFB, which is located immediately southwest of the county line.

The following land use goals and policies were found to indirectly support compatible development with Offutt AFB:

> *Goal 3.1 Provide opportunities for development in an orderly, efficient and environmentally sound manner*
>
> *Goal 3. Encourage compatible adjacent land uses throughout the County by means of regulations suited to the unique characteristics and location of each use.*
>
> *Policy 3.3.1 Establish a annual review and modification process of zoning districts and regulations to encourage both development and redevelopment activities.*

According to chapter seven, the following plan maintenance and implementation goals and policies, although do not specifically recognize Offutt AFB, support compatible land use development strategies.

> *Goal 7.1 Maintain and utilize the Comprehensive Plan as the primary tool for making County decisions regarding the physical development of the area.*
>
> *Policy 7.1.1 Establish a review process for the Comprehensive Plan and associated regulations, including Zoning and Subdivision Regulations.*
>
> *Policy 7.1.2 Coordinate local groups and organizations to carry out the Goals and Policies of this Comprehensive Plan.*
>
> *Policy 7.1.3 Coordinate development activities and land use changes with local, County and State officials.*

Additionally, the plan states the need to review and evaluate the comprehensive plan annually, this method could potentially allow for the county's updated comprehensive plan, recognize Offutt AFB to better protect the installations missions.

The following items concerning military compatibility are based on a review of the general plan:

- Policies to protect agricultural and open space lands help to strengthen mission critical activities at Offutt AFB.
- The plan does not address the military presence from a land use compatibility perspective.
- There are no noise, lighting, frequency, or vibration provisions associated with compatibility of the Offutt AFB mission in the Plan.

Zoning (Chapter 8, County Code)

The zoning ordinance divides the land within the county into 15 base districts and 1 overlay district and provides development regulations for these districts. The following compatibility concerns are based on a review of the zoning provisions:

- Airport and lighting are not defined terms in the definitions.
- Building height exceptions allowed by conditional use permit in any zone.
- Permitted heights of 35 feet to 75 feet allowable by right in the R-1, R-2, R-3, R-6, C-1, C-2, I-1, I-2, I-3 zones. All other zones do not have a set maximum height.
- Exceptions to height range from 12 feet above the height of a building (elevators, other equipment) to 100 feet for antennae.

- Communications towers have no set height limit but must be reviewed by the appropriate airport authority.
- There are no noise insullation standards for residential buildings.
- The county refers to a list of permitted uses within each zoning district rather than using performance standards.

Subdivisions (Chapter 9, County Code)

Within Pottawattamie County, the land divisions are subject to the applicable provisions of Chapter 354 of the Code of Iowa and Chapter 9 of the county code.

The following compatbility issues are based on a review of the subdivision regulations:

- Sketch Plat / Preliminary Plat / Final Plat requirements do not require the delineation of noise contours, where applicable.
- The approval process does not require notification to future property owners purchasing land in a subdivision that may be impacted by noise and vibration.

Building (Chapter 10, County Code)

Pottawattamie County has adopted the following elements as part of its building code:

- Chapter 301 Section 661-301.3, Iowa Building Code
- Chapter 301 Section 661-301.8, Iowa Residential Building Code
- Chapter 301 Section 661-301.6 Iowa Plumbing Code
- Chapter 301 Section 661- 301.4 Iowa Mechanical Code
- Chapter 301 Section 661- 301.5 Iowa Electrical Code
- International Fuel Gas Code, 2006 including Appendix A-D
- Chapter 301 Section 661- 303 Iowa Energy Conservation Code
- Chapter 301 Section 661- 301.7 Iowa Existing Building Code
- Chapter 301 Section 661-350.1 Iowa Historic Building Code
- International Property Maintenance Code, 2006
- Pottawattamie County, Iowa, Demolition of Building and Structures Code
- Pottawattamie County, Iowa, Factory Built Structures Code

The following compatibility concerns are based on a review of the building code:

- There is no reference to sound attenuation for residential building code standards.

4.21 City of Council Bluffs

The City of Council Bluffs is the largest city and County Seat of Pottawattamie County, Iowa. Council Bluffs is located north of Offutt AFB and does not have any jurisdictional control or land adjacent to Offutt AFB and the majority of Offutt AFB's footprints do not go into the city. While it is important to avoid future impacts to Offutt AFB through planning, due to the distance from operational areas, Council Bluffs' planning documents may be less influenced by Offutt AFB operations and may have less impact on base operations.

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

- City of Council Bluffs Comprehensive Plan
- City of Council Bluffs Zoning Ordinance
- City of Council Bluffs Subdivision Regulations
- City of Council Bluffs Building Codes

Comprehensive Plan

The Council Bluffs Comprehensive Plan was adopted in 1994. Land use goals within the comprehensive plan that are relevant to compatible planning state the need to provide efficient and environmentally sustainable development, establish land use patterns, encourage development that is compatible with the adjacent land uses, and develop regulations to balance development needs. Policies that are relative to compatible military land use include the following:

> *Goal 1. Provide opportunities for development in an orderly, efficient and environmentally sound manner.*
>
> *Goal 3. Encourage compatible adjacent land uses through regulations suited to the unique characteristics and location of each use.*
>
> *Policy 3.1 Establish a review process of zoning districts to encourage development and redevelopment.*
>
> *Policy 5.1 Identify and prioritize areas and processes for development, based on need, market potential, and infrastructure capabilities.*
>
> *Policy 5.4 Identify potential development areas and protect agricultural land in the two-mile jurisdiction.*

The following policies support coordination that could potentially assist the city in developing compatible land uses in relation to Offutt AFB and its missions.

> *3.1 Actively participate in the creation and training of neighborhood organizations.*
>
> *3.2 Encourage nonprofit organizations to participate in community development programs.*
>
> *1.2 Recognize the need for, and improve on intergovernmental and regional cooperation in order to reduce duplication of effort and avoid public inconvenience.*

The following items concerning military compatibility are based on a review of the comprehensive plan:

- Development regulations occur for subdivisions in limited topographical areas and conservation areas such as Loess Hills and the Missouri River.
- Comprehensive planning is focused for downtown development.
- The comprehensive goals and policies do not state military compatibility directly, change in language to specify land uses is encouraged.
- The comprehensive plan has not been updated since 1994.

Zoning Ordinance

The zoning ordinance divides the land within the city into 19 base districts and 4 overlay districts.

Conditional use permits standards that are relative to military compatibility include:

> *All exterior lighting shall be shaded as necessary to direct the light away from neighboring residential properties.*
>
> *The location, nature and height of buildings, structures, walls and fences on the site, and the nature and extent of landscaping and screening on the site shall be designed so that the use will not reasonably hinder or discourage the appropriate development, use and enjoyment of the adjacent land, buildings and structures.*

The city does state airport height limitation standards within hazard zones, even though the language does not state Offutt AFB directly. These standards must follow the FAA Part 77 regulations.

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

- Airport and lighting are not defined terms in the definitions.
- The airport hazard zones apply only to the Eppley Airfield and the Council Bluffs Municipal airport.
- Building height exceptions are allowed by conditional use permit in any zone.
- Noise standards are not described within the ordinance.

Subdivision Ordinance

The following items concerning military compatibility are based on a review of the subdivision ordinance:

- Noise contours are not defined in the design standards.
- The approval process does not require notification to future property owners purchasing land in a subdivision that may be impacted by noise and vibration.

Building Code

The City of Council Bluffs has adopted the following elements as part of its building code:

- 2009 International Building Code
- 2009 Uniform Plumbing Code
- 2009 International Mechanical Code
- 2009 International Fuel Gas Code
- 2009 International Fire Code
- 2009 International Energy Code
- 2009 Life Safety Code
- 2011 National Electrical Code

4.22 Other Resources

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

Guides

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

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

Joint Land Use Study Program Guidance Manual (November 2006)

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

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

This guidebook presents case studies of best practices between the military and communities through communication, regulatory approaches, and Joint Land Use Studies. The guide can be accessed on the NACo internet site at the following address: http://www.naco.org/.

Videos

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

This informative video discusses the issue of encroachment near military installations as urban development occurs within the vicinity. This video can be accessed on the official OEA YouTube channel at: http://www.youtube.com/watch?v=6UiyWDgLeJM

Managing Growth, Communities Respond, OEA

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

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OFFUTT
AIR FORCE BASE

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Inside Chapter 5...

Compatibility Assessment

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

A number of factors assist in determining whether community and military plans, programs, and activities are compatible or in conflict with joint land uses such as community activities and military installations. For this Joint Land Use Study (JLUS), 25 compatibility factors were used to identify, determine, and establish a set of key JLUS compatibility issues. These compatibility factors are listed on the following page.

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

COMPATIBILITY FACTORS

AQ	Air Quality	LAS	Land / Air / Sea Spaces
AT	Anti-Terrorism / Force Protection	LU	Land Use
BIO	Biological Resources	LEG	Legislative Initiatives
CA	Climate Adaptation	LG	Light and Glare
COM	Coordination / Communication	MAR	Marine Environments
CR	Cultural Resources	NOI	Noise
DSS	Dust / Smoke / Steam	PT	Public Trespassing
ED	Energy Development	RC	Roadway Capacity
FSC	Frequency Spectrum Capacity	SA	Safety Zones
FSI	Frequency Spectrum Impedance / Interference	SNR	Scarce Natural Resources
		VO	Vertical Obstructions
HA	Housing Availability	V	Vibration
IE	Infrastructure Extensions	WQQ	Water Quality / Quantity

Methodology and Evaluation

The methodology for the Offutt AFB JLUS consisted of a comprehensive and inclusive discovery process to identify key stakeholder issues associated with the compatibility factors. At the initial Policy Committee (PC) and Technical Advisory Committee (TAC) workshops and public meetings, stakeholders were asked to identify the location and type of issue in conjunction with compatibility factors they thought existed today or could occur in the future. As a part of the evaluation phase, the PC, TAC, and the public examined and prioritized the extent of existing and potential future compatibility issues that could impact land within or near the JLUS Study Area. Other factors and associated issues were analyzed based on available information and similarity with other community JLUS experiences around the country.

The selection and inclusion of strategies is directly and indirectly affected by the evaluation of issues. Issues were prioritized into four different categories with an associated time frame and presented to the PC and TAC for review. Since the PC and TAC accepted the priorities as is, the priorities will be used to determine the timeframe for initiating strategies by the primary and partner agencies.

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

- This chapter provides a technical background on the factors and issues discussed based on available information. The intent is to provide an adequate context for awareness, education, and development of JLUS recommendations. It is not designed or intended to be utilized as an exhaustive technical evaluation of existing or future conditions within the Study Area.
- Of the 25 compatibility factors considered, four were determined to be inapplicable to this JLUS:
    - Marine Environments
    - Public Trespassing
    - Scarce Natural Resources
    - Vibration

Organization of the Issues

Chapter 5 is organized into two main sections: Minor Issues and Major Issues. The Minor Issues are identified by a simple heading defining the compatibility factor for which it relates. These issues were isolated from the original set of compatibility issues as they were determined not to be as important as the major issues. Thus, the Minor Issues did not warrant in-depth analysis. While several factors had both Minor and Major Issues, the Cultural Resources and Light and Glare factors only had issues classified as Minor, so the technical background and key terms information for those factors will be found in the Minor Issues section of Chapter 5.

The Major Issues section provides more in-depth analysis of the more important issues for the Offutt AFB JLUS and as such is organized by compatibility factor. Each factor will be identified with a number, e.g., 5.1, 5.2, etc. The factor's definition, technical background, and key terms information will also be found in each numbered subsection

.

Please see the next page.

Minor Issues

Air Quality

ISSUE AQ-m1	**Vehicle exhaust from idling cars** When the new STRATCOM facility opens, there is expected to be traffic congestion on-base that may impact air quality from many vehicles idling as they wait to park.

Compatibility Assessment

While air quality is not always a major concern for the military and local jurisdictions, there is concern regarding idling vehicles and the emissions they let out in the area surrounding Offutt AFB while drivers wait to park their vehicles. In particular, there is expected to be increased traffic congestion in accordance with the opening of the new STRATCOM facility at the installation due to the fact it will only have two lanes to access parking. The new facility will shift a large population to the new location, which may cause bottlenecking and long wait times to park. The longer wait time for parking may increase the amount of vehicle emissions on-base.

STRATCOM personnel typically work different shift times than other employees at Offutt AFB. They start and end at a half hour or one hour difference from other employees to help reduce traffic congestion at gates during peak times. This will help offset congestion once the new facility is operational. Additionally, Offutt AFB is looking into the development of a carpool program, and also redesigning the queue from the gate to the parking lot, but this will be dependent upon funding.

The building will open in 2016, but most employees will not move into the building until 2018. It is undetermined what effect the idling cars will have on air quality until the facility is opened.

Existing Tools

Clean Air Act

The Clean Air Act (CAA) is the comprehensive federal law that regulates air emissions and particulate matter from stationary and mobile sources in order to control air pollution. Under the CAA, the EPA established limits on six criteria pollutants to protect public health and welfare. The CAA also gives the EPA the authority to limit emissions of air pollutants originating from sources such as chemical plants, utilities, and steel mills. Individual states may have more stringent air pollution laws, but they may not have weaker pollution limits than those set by EPA. The CAA is the federal enabling legislation that allows the state of Nebraska to adopt air quality and emission standards.

The Motor Vehicle Air Pollution Control Act, which was an amendment to the CAA, set the first federal standards for vehicle emissions. Title 2 of the CAA currently sets emission standards for all moving sources, including motor vehicles, non-road engines, aircraft, and buses. This section of the CAA identifies that state environmental entities have the authority to monitor and regulate mobile source emissions, which is what the Nebraska Department of Environmental Quality currently does.

Nebraska Department of Environmental Quality

The Nebraska Department of Environmental Quality (NDEQ) allows for natural resource management guidance for Offutt AFB and provides planning requirements for air, water, and waste management in and around the installation. The NDEQ works with installations and communities to provide environmental compliance and regulatory standards.

Ambient air quality standards are detailed within Chapter 4 of the Nebraska Air Quality Regulations (Nebraska Administrative Code, Title 129).

Within Chapter 1 of Title 129, the definition of "mobile source" encompasses all motor vehicles and non-road vehicles and the emissions that come from those sources. While the source of private vehicle emissions from tailpipes is defined in the regulations, there are no specific air quality standards for vehicle emissions in the regulations to which private, personal automobiles must adhere to. Additionally, because air pollution caused by vehicles is primarily a concern for highly populated states, NDEQ and the Nebraska Department of Motor Vehicles (DMV) have no official policy regarding emissions testing or smog check requirements to obtain a vehicle registration for non-diesel-powered motor vehicles.

On the other hand, Chapter 39 of Title 129, titled Visible Emissions from Diesel-Powered Motor Vehicles, deals directly with emissions that come from vehicles using diesel gasoline, which are usually not private, personal automobiles. These standards regulate smoke from exhaust pipes of diesel fueled engines, which would not apply to the majority of vehicles that would be idling waiting to park at the new STRATCOM facility.

Findings

- NDEQ and the Nebraska DMV have no official policy regarding emissions testing or smog check requirements to register cars.
- Chapter 39 of Title 129, titled Visible Emissions from Diesel-Powered Motor Vehicles regulates smoke from exhaust pipes of diesel fueled engines, which would not apply to the majority of vehicles that would be idling waiting to park at the new STRATCOM facility.

ISSUE AQ-m2	**Concern about fuel dumping**
	There is a public concern about the potential for aircraft impacts on air quality relative to two items: ■ potential for lead contamination from aircraft flying overhead, and ■ potential fuel dumping from aircraft operating at Offutt AFB.

Compatibility Assessment

During development of the JLUS, a public comment expressed concern over lead contamination associated with aircraft flying over local communities and the exhaust of the aircraft falling onto the areas below the flight path. In checking with the 55th Wing at Offutt AFB, it was confirmed that all aircraft operating from Offutt AFB use only JP-8 aviation fuel, and that this fuel contains no lead (lead is an additive used primarily with fuels for piston engines to reduce "knocking", and jet engines do not require this additive). Based on this, it was determined that there is no issue with lead in jet exhaust, and therefore, no new strategies would be required.

During the development of the JLUS, a public comment also expressed concern about aircraft fuel "dumping" occurring in the areas adjacent to Offutt AFB. The primary concern was on potential environmental degradation, harmful effects on the public this activity could cause, and overall air quality impacts that could result from such activity.

During certain emergency scenarios, aircraft may be required to release fuel in flight in order to achieve a safe landing weight. This primarily occurs when an aircraft has taken off and develops mechanical or other emergency that requires return to Offutt AFB.

A plane has two weights that are important to consider in this discussion – maximum takeoff weight and maximum structural landing weight. The

maximum takeoff weight is the heaviest weight of an aircraft to be airworthy and includes all of the necessary fuel to ensure the aircraft can perform its operations and reach its destination. The maximum structural landing weight determines weight that the plane can land safely. If an aircraft is too heavy during landing, then structural damage to the aircraft could occur, resulting in safety concerns for those aboard the aircraft. The maximum structural landing weight is lower than the takeoff weight.

Should an emergency arise where the aircraft must return to the departing location and the aircraft has not expended the necessary fuel to lower the weight of the plane (the maximum structural landing weight) for a safe landing, then fuel release in flight may be required. At Offutt AFB, aircraft that require a fuel release are directed to a specific area and altitude for the release. The fuel release typically occurs at high altitudes to ensure minimal or no impact on the ground due to evaporation of the fuel in the air.

Existing Tools

Federal Aviation Administration Order JO 7110.65T

The Federal Aviation Administration (FAA) established provisions for the safe release of fuel in certain situations from an aircraft pursuant to Order JO 7110.65T. Upon a determination by the pilot that fuel dumping is necessary, the pilot makes contact with the nearest air traffic control tower (ATCT) to communicate the need to dump fuel. The ATCT utilizes the pilot's flight information such as location, whether it is flying via IFR or VFR, and then communicates routing information to the pilot, assigns an altitude for the dumping, and ensures that other aircraft in the vicinity are separated from the activity. In the instance of a pilot flying in IFR conditions, the altitude for fuel dumping is no less than 2,000 feet above the highest obstacle within five miles of the route or pattern being flown. This altitude allows for the fuel to be evaporated resulting in minimal or no impacts on the ground.

Offutt AFB Instruction on Fuel Dumping

While the FAA requires a minimum of 2,000 foot separation from the ground level at the highest point to dump fuel, Offutt AFB instruction is more restrictive and requires pilots to maintain a minimum altitude of 20,000 feet mean sea level (MSL), when conditions permit, at a designated fuel dump block of airspace approximately 75 miles south of Offutt AFB. This higher altitude for fuel dumping established by Offutt AFB provides a greater level of safety and environmental protection. As a consequence of these stringent protocols, there is no evidence that these activities have had, or will have, a negative environmental or health impact.

Findings

- With the use of JP-8 fuel, there is no lead contained in the fuel, or resulting exhaust, of jet operations from Offutt AFB.
- Requirements are established that properly address concerns about fuel dumping.
- Offutt AFB has adopted and implements procedures and standards that far exceed the conventional, minimum requirements for fuel dumping.

Please see the next page.

Anti-Terrorism / Force Protection

ISSUE AT-m	**Fort Crook Road and Harlan Lewis Road adjacent to Offutt AFB** Fort Crook Road is adjacent to Offutt AFB and is in proximity to sensitive areas such as the new STRATCOM headquarters and officer and personnel on-base housing. People using Harlan Lewis Road on the east side of the base can see into the base in certain areas.

Compatibility Assessment

Portions of the installation border along Fort Crook Road exist with little or no visual separation between the controlled perimeter fence and the external community. Sensitive areas, such as the new STRATCOM headquarters, are within sight and open to observation by people passing by the base. While it is important for the installation to maintain clear lines-of-sight to surveil areas outside the installation for potential security risks, lines-of-sight that provide viewing and vantage points into the installation create an undesirable security scenario. After the new STRATCOM headquarters is complete, plans are in place to install buffers where old buildings were previously located along the edge of the installation.

Harlan Lewis Road runs along the east side of Offutt AFB. Due to the flat terrain, people traveling along this road are able to see into the base in certain spots. It is possible for people to stop along the road and look into the base, which has happened in the past. Local law enforcements and Offutt security personnel monitor this area and have in the past asked people to keep moving when they have stopped on the road.

Existing Tools

Unified Facilities Criteria 4-010-01 DOD Minimum Antiterrorism Standards for Buildings

Section 2-4.1.3 of Unified Facilities Criteria (UFC) 4-010-01 states that the firing of weapons from someone intending to cause harm or damage is easier when direct lines of sight are available. The assumption is that weapons could be fired from vantage points outside the control of an installation or facility without detection. Obscuring or screening that minimizes targeting opportunities is the primary means of protecting DOD personnel. Section B-3.2.3 of the standards recommends screening or blocking sightlines of building entries from multiple vantage points.

In addition to screening, Section 2-3.1 also provides the design strategy of maximizing standoff distances. The primary design strategy is to keep someone intending to cause harm or damage as far away from inhabited DOD buildings as possible. The easiest and least costly opportunity for achieving the appropriate levels of protection against terrorist threats is to incorporate sufficient standoff distance into project designs.

Findings

- There is potential for security risks as sensitive areas are developed along Fort Crook Road.
- Plans are in place to follow UFC 4-010-01 and install buffers along the edge of the installation once construction is complete.
- Maximizing standoff distances keeps someone intending to cause harm or damage as far away from the base as possible.

Please see the next page.

Cultural Resources

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

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

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

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

ISSUE CR-m	**Base Cemetery near Bellevue Gate**
	There is a military cemetery on Offutt AFB near the Bellevue Gate. This gate was temporarily closed, prompting visitors to go through the Kenney Gate to get to the cemetery during this time.

At the time of this JLUS, this issue was brought up as a concern in accessing the small military cemetery located on Bonner Lane, off of Nelson Drive, directly inside the Bellevue Gate. This cemetery is culturally and historically significant as the first burial at the site dates back to 1898, when Offutt AFB was Fort Crook. Since that time over 800 military personnel, veterans, and family members have been buried in the cemetery. Each year the base hosts a Memorial Day ceremony, which was attended by about 150 people in 2014. Access through the Bellevue Gate is the most convenient gate for visitors coming from the north side of the base.

Offutt AFB base cemetery

However, between December 30, 2014 and March 30, 2015, the Bellevue Gate was temporarily closed due to several factors, including the deployment of 55th Security Forces Squadron (55th SFS) personnel, the personnel responsible for manning the gate.

The gate was reopened following the return of some personnel from the 55th SFS, augmenting security forces from other Team Offutt personnel, and addressing some of the installation security requirements at the gate. If in the future the Bellevue Gate should need to close again for a temporary amount of time, then notification of such an event is appreciated to ensure timely access of the military cemetery by visitors.

Frequency Spectrum Impedance / Interference

ISSUE FSI-m	**Concerns regarding potential frequency interference following the development of the Google campus in Pottawattamie County** The Google campus located in Pottawattamie County is a major economic driver for the region. Some concerns have been voiced regarding potential frequency interference; however, the campus does not involve satellite transmissions, so is not likely to cause frequency impacts with Offutt AFB.

Compatibility Assessment

The military's uninterrupted use of its assigned radio frequency is required for secure and effective testing and operations. The military's frequency spectrum needs for testing, evaluation, and training are generally increasing, while the spectrum available for DOD use is generally decreasing. The DOD has been allocated a portion of the spectrum as are all federal agencies. However, due to the sale or auctioning off of other spectrum from other federal agencies to commercial industry for wireless and telecommunications operations, this decreases the availability for some important military training to occur on all frequencies, i.e. electronic warfare where the DOD trains to jam and disable enemy communications. Enemy communications can be on any frequency.

Future development surrounding Offutt AFB has the potential to impact the military's uninterrupted use of the frequency spectrum. There is a need for available frequency spectrum at the installation; however, surrounding development that may use frequency bandwidth has potential to conflict with this need. Additionally, several satellites on the campus (including a large antenna satellite) receive signals for hundreds of TV channels that make up Google Fiber's TV service. There is also a second Google Campus (data center campus) currently under separate phases of construction, which is located along Bunge Road, further south in Council Bluffs, and much closer to Offutt AFB. This new campus is strictly a data center and does not involve satellite transmissions, so it is not likely to cause frequency interference with Offutt AFB

Data centers serve as storage space for digital information and data, including e-mails, videos, and photos, and usually comprise a facility with many computers and servers that store and process large amounts of information. The expansive data center campus, which is the second in the area (the original campus is on Veterans Memorial Highway) houses computer servers and other components that support Google services including Gmail, Google Maps, and Google Search. When additional construction phases begin, there will be many types of construction equipment that may be using various frequencies for communication. Potential impacts from construction will be temporary and resolved once the construction is complete. While there are concerns that the new campus may impact local frequency bandwidth, it is unlikely that frequency interference would occur due to the type of operations that will occur at the new Google campus (server farm). However, there is potential for frequency interference in the future due to the progressively popular Google Fiber TV service.

Existing Tools

As part of this JLUS effort, no existing tools were identified that address this compatibility issue.

Findings

- While there are concerns that the new campus may impact local frequency bandwidth, it is unlikely that frequency interference would occur due to the type of operations that would occur there (server farm).
- There is potential for frequency interference between the original Google Campus in Council Bluffs and Offutt AFB in the future due to transmissions for the Google Fiber TV service.
- This issue is categorized as an awareness issue since it is primarily unaffected by military activity or operations at Offutt AFB.

Major Issues

5.1 Air Quality (AQ)

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

Key Terms

Attainment Area. An attainment area is a geographic area that meets the National Ambient Air Quality Standards for a criteria pollutant.

Criteria Pollutants. The criteria pollutants are the six principle pollutants harmful to public health and the environment for which the Environmental Protection Agency has set National Ambient Air Quality Standards (NAAQS). The pollutants are: carbon monoxide (CO), lead, nitrogen dioxide (NO2), ozone (O3), particulate matter (PM), and sulfur dioxide (SO2).

Design Value. A design value is a statistic that describes the air quality status of a given location relative to the level of the NAAQS.

National Ambient Air Quality Standards. The NAAQS are standards for outdoor air pollutants established by the Environmental Protection Agency under authority of the Clean Air Act.

Nonattainment Area. A nonattainment area is a geographic area where air pollution levels persistently exceed NAAQS, or that contributes to ambient air quality in a nearby area that fails to meet standards. Designating an area as nonattainment is a formal rulemaking process made by the Environmental Protection Agency, typically only after air quality standards have been exceeded for several consecutive years.

Ozone (O3). Ozone is a pungent, colorless, toxic gas with direct health effects on humans, including respiratory and eye irritation and possible changes in lung functions. Ozone is created when hydrocarbons and nitrogen oxides released from vehicles and industrial sources react in the presence of sunlight. Because ozone requires sunlight to form, it occurs in concentrations considered serious primarily between the months of April and October.

Particulate Matter (PM). Particulate matter consists of fine metal, smoke, soot, and dust particles suspended in the air. Particulate Matter is measured by two sizes: Course particles (PM10), or particles between 2.5 and 10 micrometers in diameter in size, and fine particles (PM2.5), or particles less than 2.5 micrometers in diameter.

Technical Background

A number of factors can influence air quality in a region. These include a variety of sources and types of pollutants, topographic conditions, weather, and other factors. Community sources of dust, car emissions and air pollutants can also create adverse impacts on the environment and can potentially limit Offutt AFB operations. Permits and funding for important infrastructure can be delayed or denied in non-attainment areas, or perhaps be issued subject to mitigation measures that increase the costs of project implementation.

Under the Clean Air Act, the US Environmental Protection Agency (EPA) established NAAQS for air pollutants. The NAAQS have been set for the six criteria air pollutants. Air quality control regions (AQCR) are classified either “attainment” or “nonattainment,” according to whether or not the concentrations of criteria pollutants exceed the NAAQS. Nonattainment designation categories are Marginal, Moderate, Serious, Severe, and Extreme.

ISSUE AQ-1	**Proposed new ozone standards** Proposed new ozone standards may be an issue since the Study Area is close to the new limit.

Compatibility Assessment

In Nebraska, authority has been delegated to the NDEQ to ensure the state maintains or moves into attainment with all NAAQS; in Iowa, this power has been delegated to the Iowa Department of Natural Resources. Any future regulatory changes in ozone NAAQS may expand nonattainment areas in the region to include Offutt AFB and its surrounding jurisdictions, which are currently in the Nebraska Air Quality Control Region (AQCR 085, Bellevue sub region).

In 2008, the ozone NAAQS of 80 parts per billion (ppb) monitored over an eight-hour period was revised to a more stringent threshold of 75 ppb. The final policy assessment was complete in August 2014 and the proposal for stricter levels was announced in November 2014. The proposed rules would lower the threshold for ozone from 75 ppb to between 65 ppb and 70 ppb. EPA said it would take comments on an ozone level as low as 60 ppb. The area in Nebraska that could be directly impacted by the proposed new standards is the Omaha metropolitan area. The potentially affected area includes several counties in eastern Nebraska and western Iowa. Consequently, operations at Offutt AFB could be impacted by the new ozone NAAQS due to the area already being close to the limit for an attainment area.

Currently, there are three monitoring sites in the Omaha metro area for ozone levels, one of which is located at the NCore site, a multi-pollutant site that monitors for CO, NOx/NOy, SO2, O3, PM10, PM2.5, Lead and meteorological parameters. Within the Omaha Metropolitan Statistical Area (MSA) are seven counties in Nebraska and Iowa. This MSA is currently in attainment with the 2008 ground-level ozone NAAQS, but the levels have been rising. This can be caused by many different factors, including increased emission sources, temperature, increased traffic, or local and national events. In Pisgah, Iowa, part of the MSA, the annual ozone level has risen from 67 to 75 ppb since 2010 and the design value, or three year average used to demonstrate attainment, has risen from 63 to 69 ppb. At 30th & Fort Street in Omaha, the annual level has risen from 64 to 77 ppb since 2010 and the design value has increased from 61 to 66 ppb. While Omaha remains in attainment for ground-level ozone, additional high annual levels or an approved revision to the ozone standard could cause the area to go into nonattainment for the ozone NAAQS.

Pottawattamie County in Iowa is designated as partially nonattainment for lead, one of the NAAQS pollutants as recognized by the EPA. Consequently, operations at Offutt AFB could be impacted by Clean Air Act issues and the pollutants found within the nonattainment area.

Compliance with the Clean Air Act is a high priority for Offutt AFB. Future regulatory changes may expand nonattainment areas to include Offutt AFB and surrounding areas. A designation of nonattainment would require Offutt AFB to continue to pursue more efficient equipment and operating procedures to reduce air emissions. It would also entail setting potential restrictions on emissions (from cars, and possibly aircraft) and other harmful effects on air quality within the new nonattainment area.

These proposed new requirements for NAAQS compliance could result in the need of new equipment and technologies to reduce emissions at Offutt AFB and possibly limit operations associated with air (and motor vehicle) emissions contributing to ozone formation. Offutt AFB must also rely on regional cooperation to achieve attainment levels, which will require awareness and ongoing monitoring by both Offutt AFB and the surrounding jurisdictions.

Existing Tools

United States Environmental Protection Agency

Located on the US EPA website is a "Green Book" page dedicated to criteria pollutants such as ground-level ozone, which details NAAQS for the criteria pollutants, as well as various resources in regards to nonattainment areas, standards, designations, and regulatory actions. According to the 2008 8-hour ozone nonattainment areas map provided on the page, there are no areas in eastern Nebraska / western Iowa that fall under one of the five classifications for ozone nonattainment. For the 2008 ozone standards, the entire state of Nebraska and the entire state of Iowa are both within levels of attainment for ground level ozone standards. In fact, after 1988, the only county in Nebraska that was ever within any of the criteria pollutants nonattainment levels was Douglas County, which was in nonattainment for lead (by 1978 standards) from 1992 to 2000, but was then re-designated to the "maintenance" level in 2001. Sarpy County was only in nonattainment for 1-hour ozone from 1978 to 1982.

The EPA website also contains ozone reduction strategies for achieving NAAQS attainment, some of which have been carried out by the NDEQ as well as local departments, such as the City of Omaha's Air Quality Control, within the Environmental Quality Division of their Public Works Department.

2014 Nebraska Ambient Air Monitoring Plan

The 2014 Ambient Air Monitoring Network Plan (hereafter referred to as the "2014 Network Plan") was prepared by NDEQ to meet the requirements of federal regulations set forth in 40 CFR Part 58.10, which requires a state implementation plan for NAAQS. The plan is mean to describe the purpose of each monitoring site, discuss air quality issues, and describe planned and possible changes to the monitoring network through 2015.

The plan identifies several sections on ozone monitoring, particularly for the Omaha MSA. The plan details that the Omaha MSA remains in attainment with the current 75 ppb 8-hour ozone NAAQS, although it also portrays how the attainment status of the Omaha MSA might be impacted if the ozone NAAQS is lowered into the 60 to 70 ppb range. Currently, out of the three monitoring sites in Omaha, three year averages include 67, 60, and 65 ppb, which equate to 89 percent, 80 percent and 87 percent of the NAAQS limit, respectively. Logically, if the ppb limit was changed to 70, the Omaha MSA would be at risk for nonattainment. If the ppb limit was changed to 65 or 60, then the Omaha MSA would become a nonattainment area. If this should happen, it is possible that special studies could be performed to investigate higher ozone concentration areas, such as manufacturing and industrial areas in Douglas, Sarpy, and Pottawattamie counties, and potentially Offutt AFB.

Findings

- According to the 2008 ozone standards, the entire state of Nebraska and the entire state of Iowa are both within levels of attainment for ground level ozone standards.
- Sarpy County was only in nonattainment for 1-hour ozone from 1978 to 1982. The county is currently within attainment levels for all criteria pollutants.
- Currently, there are three monitoring sites in the Omaha metro area for ozone levels, one of which is located at the NCore site.
- The Omaha MSA is currently in attainment with the 2008 ground-level ozone NAAQS, but the levels have been rising.
- Currently, out of the three monitoring sites in Omaha, three year averages include 67, 60, and 65 ppb, which equate to 89 percent, 80 percent and 87 percent of the NAAQS limit, respectively. An approved revision to the ozone standard, lowering the ozone NAAQS to 65 or 60 could cause the area to go into nonattainment.

- The EPA website also contains ozone reduction strategies for achieving NAAQS attainment. NDEQ and Omaha's Air Quality Control Division should work on implementing some of these strategies.
- Special studies should be performed to investigate higher ozone concentration areas, such as manufacturing and industrial areas.
- An update to the 2013 Nebraska Air Quality Report is needed in order to identify new ground ozone levels to see if they are in attainment.

5.2 Anti-Terrorism / Force Protection (AT)

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

The Department of Defense (DOD) AT/FP standards require all DOD components to adhere to design/planning criteria and minimum construction standards to mitigate vulnerabilities and threats to an installation and its occupants. Important aspects of these criteria and standards include minimum standoff distances or required separation between buildings and roadways and parking lots and buildings and trash enclosures.

Key Terms

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

Fence Line. The term fence line in this section refers to the exterior fence around Offutt AFB. Fence lines are often inset from a property line if possible.

Sight-lines (lines-of-sight). This refers to the angles of lines-of-sight from off-installation structures to on-installation structures and vice versa. Lines-of-sight are necessary to maintain an unobstructed view of the installation and to ensure that visual access to the installation does not occur where inappropriate and occurs where appropriate such as for communications and frequencies.

ISSUE AT-1	**Future land development could allow line-of-sight views into Offutt AFB** Future land development on the south side of the runway, near Harlan Lewis Road and the railroad, could cause security concerns regarding individuals being able to look in on military operations.

Compatibility Assessment

There is potential for development to occur south of Offutt AFB following the construction of Highway 34, as discussed in issue IE-1. The area along the southern fence line is zoned Agricultural (AG), General Business (BG), and Heavy Neighborhood Business District (BNH) in the City of Bellevue. The BNH district has a maximum building height of 25 feet, the AG district has a maximum building height of 35 feet, and the BG district has a maximum building height of 75 feet.

Effective AT/FP at Offutt AFB is necessary to ensure confidential operations are protected from observation by unauthorized parties outside of the base. While it is important for the installation to maintain clear lines of sight to view outside the installation for potential security risks, lines of sight that provide viewing and vantage points into the installation create an undesirable security scenario.

Security Forces at the base have stated that development in sensitive areas south of the base should be limited to two or three stories. All of the AG and BG zoning districts within the City of Bellevue have maximum building heights that exceed that recommendation. Due to the proximity of Offutt AFB, land zoned AG, BG, and BNH south of the installation has the potential for incompatible development due to a line-of-sight onto the installation.

Existing Tools

Unified Facilities Criteria 4-010-01 DOD Minimum Antiterrorism Standards for Buildings

Section 2-4.1.3 of Unified Facilities Criteria (UFC) 4-010-01 states that the fire of weapons from a terrorist is predicated on direct lines of sight and the assumption that weapons could be fired from vantage points outside the control of an installation or facility. Obscuring or screening that minimizes targeting opportunities is the primary means of protecting DOD personnel. Section B-3.2.3 of the standards recommends screening or blocking sightlines of building entries from multiple vantage points.

City of Bellevue Zoning Ordinance

In Section 5.29 of the City of Bellevue Zoning Ordinance regulations for the AICUZ Overlay District are provided. The section of the ordinance regulates the intensity and compatibility of new development within the district. Some of the land south of the base is within the noise zones and height obstruction areas and only a small amount of the incorporated city land is located within the Clear Zone (CZ); however, the remaining land within the CZs and the Accident Potential Zones (APZs) are part of the city's extraterritorial jurisdiction (ETJ) and therefore the AICUZ Overlay District applies to that land as well.

The Base Civil Engineer at Offutt AFB is notified for comments when new development is proposed in the noise and height restricted area. Any uses proposed within the Offutt AFB safety zones have to conform to the standards for uses in safety zones set by the Air Force, and the uses within areas proximate to the installation would have to conform to height limits set forth by Federal Aviation Administration (FAA) Part 77. However, uses in the noise zones are less restricted, and while the noise zones require sound attenuation measures, they do not specifically regulate the height of buildings. Consequently, new development outside of safety zones, but proximate to the installation, could potentially meet the requirements of the AICUZ overlay, but may allow for a clear line of sight into the installation. It is also possible that shorter buildings still provide for a line of sight into the installation, depending on the location of the structure. Currently, most of the land within the southern safety and noise zones is zoned agricultural (and also falls under the AICUZ overlay district) which would limit the intensity and types of development that would be allowed to go there.

City of Bellevue Comprehensive Plan

The City of Bellevue's Comprehensive Plan contains both the existing and future land use map for the city and its ETJ areas. The existing land use map shows that the only uses existing to the south and southeast of the installation are currently agricultural and one parcel of retail (Catfish Lake Restaurant). The future land use map within the comprehensive plan identifies potential uses to the south and southeast of the installation to include agricultural / open space, and light industrial uses. While the light industrial uses could potentially support line of sight into the installation, the agricultural land use would serve as a buffer and would most likely reduce any line of sight concerns.

Findings

- Unobstructed sightlines into Offutt AFB could create a potential security risk by providing views and vantage points into the installation.
- Line of sight concerns do not have to stem specifically from tall structures. If located in the right spot, a structure of 25 feet could cause line of sight and AT/FP vulnerability concerns for the installation.
- The future land use map within the Bellevue Comprehensive Plan identifies potential for light industrial uses to the south / southeast of the installation, which could cause line of sight concerns.
- A vegetative buffer perimeter around the south / southeastern side of the installation could potential mitigate line of sight concerns.

- The Base Civil Engineer at Offutt AFB is notified for comments when new development is proposed in the City of Bellevue in the noise and height restricted area.
- The City of Bellevue AICUZ zoning overlay establishes land use regulations for noise and height obstructions, and establishes height restrictions for imaginary surfaces pursuant to FAA Part 77.

ISSUE AT-2	**Hazardous materials pass by Offutt AFB** The railroad that passes near the installation sometimes carries hazardous cargo that could impact the base if an accident occurred.

Compatibility Assessment

Hazardous materials have the potential to create significant impacts on the health and safety of the environment and the community due to the chemical or dangerous characteristic of the materials. Areas of concern have been raised due to the transportation of hazardous materials, such as farming chemicals, relatively close to Offutt AFB boundaries and adjacent or nearby land uses.

Rail transportation is recognized as the safest method of moving large quantities of chemicals or hazardous materials over long distances. According to the Federal Railroad Administration, rail industry's safety performance, as a whole, is improving. However, characteristics of hazardous materials, such as flammability or toxicity, have the potential to create safety and security risks in the event of a derailment, spill, or leak.

The Burlington Northern Santa Fe Railroad runs from north of the base, from the City of Omaha, around the east side and then continues south. The Union Pacific Railroad runs from north of the base, around the west side and then continues south. Concerns have been raised due to the transportation of hazardous materials along these rail lines, which are relatively close to the fence line of Offutt AFB.

Neither of the railroads that transport past Offutt AFB communicates with the base on a regular basis when hazardous materials are being shipped. This is generally not a problem, since the mere existence of materials traveling safely is not an issue. The concern arises in the event of an accident in which hazardous materials are spilled near or on Offutt AFB. Offutt personnel responding to the emergency may not know if hazardous materials are present, and if they are, they may not know what kind or how to safely respond to the spill, fire, or other scenario. Railroad cars with hazardous materials have placards on them identifying the presence of materials, but do not identify what the materials are.

Burlington Northern Santa Fe train transporting oil through Nebraska

In the event of an emergency, Offutt AFB would be notified of the situation, but may not be provided with specifics on what the train was carrying. To be better prepared in the event of an emergency situation, Security Forces

should know what is happening along the fence line. There is a need for improved coordination between the railroads and Offutt AFB regarding the transportation of hazardous materials.

Existing Tools

Nebraska Hazardous Materials Regulations

The Federal Hazardous Materials Regulations apply to persons who transport hazardous materials or cause hazardous materials to be transported in interstate or intrastate commerce. The State of Nebraska has adopted the following parts of the Federal Hazardous Materials Regulations:

(1) Part 107 - Hazardous Materials Program Procedures, subpart F-Registration of Cargo Tank and Cargo Tank Motor Vehicle Manufacturers, Assemblers, Repairers, Inspectors, Testers, and Design Certifying Engineers;

(2) Part 107 - Hazard Materials Program Procedures, subpart G-Registration of Persons Who Offer or Transport Hazardous Materials;

(3) Part 171 - General Information, Regulations, and Definitions;

(4) Part 172 - Hazardous Materials Table, Special Provisions, Hazardous Materials Communications, Emergency Response Information, and Training Requirements and Security Plans;

(5) Part 173 - Shippers-General Requirements for Shipments and Packaging's;

(6) Part 177 - Carriage by Public Highway;

(7) Part 178 - Specifications for Packaging's; and

(8) Part 180 - Continuing Qualification and Maintenance of Packaging's.

These regulations apply to all motor carriers, including cars, trucks and rail cars. When a motor carrier performs a hazardous material transportation function, the carrier is responsible for performing that function in accordance with these regulations. The cargo space of the vehicle should be suitable for the material being shipped. The vehicle itself must be in sound mechanical condition. The carrier must check to insure that the material offered by the shipper is properly described and packaged.

Additionally, if any motor carrier will be carrying a hazardous material that is either a Class 7 (radioactive) material, over 25 kg, more than one liter, or a material poisonous by inhalation, they will be required to apply for a Hazardous Materials Safety Permit. In addition, they will be required to apply for a Hazardous Materials Registration prior to being issued a USDOT number for intrastate or interstate commerce.

Source: Nebraska State Patrol

State of Nebraska Hazard Mitigation Plan, 2014

The Nebraska Hazard Mitigation Plan included a risk assessment survey issued to jurisdictions throughout the state, in order to rate the magnitude, frequency, areas affected, and speed of potential hazards. Chemical Transportation was rated as a high risk, scoring an 80 or higher out of 100, meaning there is a high probability of occurrence within the jurisdiction over the next 10 years. Chemical transportation received an average score of 87.48 percent in region one, which includes Sarpy County. Other risk scores in region one for the transportation of hazardous materials include 55.81 for radiological transportation and 73.48 for (general) transportation of hazardous materials, both of which were rated medium risk hazards, meaning the probability of occurrence over the next 10 years is considered moderate. Public hazards associated with chemical transportation include housing contamination, possible causalities, and property damage, negative impacts on food or water, and possible evacuation of areas. Mitigation goals and objectives are also presented in the plan, with the purpose to protect property and individuals from local hazardous risks.

Source: State of Nebraska Hazard Mitigation Plan, 2014

Nebraska Department of Roads (NDOR)

The Nebraska Department of Roads has a Hazardous Materials Division, but it is does not regularly they monitor the transportation of hazardous materials proximate to Offutt AFB. NDOR's responsibility includes following federal, state and local laws and regulations that apply to hazardous materials. They also help regulate and maintain procedures in responding to and remediating transportation related to spills of hazardous waste or petroleum.

Hazardous Materials: Enhanced Tank Car Standards and Operational Controls for High-Hazard Flammable Trains rule

On May 1, the US Department of Transportation announced that through the collaboration of the Pipeline and Hazardous Materials Safety Administration and the Federal Railroad Administration a new rule for "Hazardous Materials: Enhanced Tank Car Standards and Operational Controls for High-Hazard Flammable Trains". This rule aims to strengthen standards for the transportation of crude oil and ethanol by rail. Among other items, this rule adds routing requirements, speed restrictions, and improved communications strategies with local government agencies to inform them about oil-by-rail activity.

Findings

- Nebraska has adopted several of the Federal Hazardous Materials Regulations.
- A new US Department of Transportation rule will require enhanced communication between rail operators and local government agencies about the transportation of crude oil and ethanol.
- NEMA is able to provide guidance and support by reviewing mitigation projects but does not provide funding.
- Offutt AFB would need to provide all agencies with details on the areas with potential impact concerns and describe the issues regarding the use of the hazardous materials before mitigation plans can be established.

ISSUE AT-3	**Closure of Bellevue Gate**
	AT/FP response times outside the base are impacted when the Bellevue Gate is closed.

Compatibility Assessment

The 55th Security Forces Squadron (SFS) protects and defends Offutt AFB personnel and resources. The unit operated three installation entry points, a Visitor Control Center, law enforcement patrols, flight line security, an investigative branch, Combat Arms Training, and the wing anti-terrorism office. The unit works closely with the surrounding jurisdictions to mutually assist one another in case of emergency.

Bellevue Gate in operation

The Bellevue Gate is utilized to access and exit the base on the north side. The gate was closed in December 2014 to help the 55th SFS mitigate operational requirement issues, due to the fact there were a high number of members deployed overseas. When the gate is closed, it is locked, which delays the response time. In an emergency situation it is important that responders are delayed as little as possible. The gate reopened in March 2015 after members returned from a previous deployment, providing an adequate number of personnel to work the gate. The future of the Bellevue Gate is uncertain and may be closed again in the future if deployment is required. As funding becomes available, the 55th SFS will continue to increase security measures and upgrade the gate in the future. Plans are in place to completely renovate the gate infrastructure to decrease the amount of required personnel yet still meet Air Force standards.

Air Force Instruction enforces measures that help ensure the safety of the base, such as limiting the number of access points. However, the Entry Control Facilities Design Guide emphasizes the importance of capacity to maximize traffic flow. Entry points must balance the safety of the base and access efficiency. The Bellevue Gate helps traffic flow and convenience, but it must be staffed appropriately.

Existing Tools

Air Force Installation Entry Control Facilities Design Guide

Entry Control Facilities (ECFs) serve as the entry point for all personnel, visitors, and deliveries to Air Force installations. The objective of ECFs is to prevent unauthorized access and maximize vehicular traffic flow. Priorities in the design of ECFs are:

- Security
- Safety
- Capacity
- Image

The ECF must maximize vehicular traffic flow to eliminate undue delays that would affect base operations while maintaining vigilance against acts of terrorism.

Air Force Instruction 10-245 Anti-terrorism Program

Anti-terrorism measures included in the Air Force Instruction (AFI) 10-245 apply to the closure of the Bellevue Gate. Measure A2.1.1.7 involves the review and familiarity with mutual aid and host-tenant support agreements. It requires the base to keep law enforcement agencies appraised of the current situation and threat to determine the level of incident support the installation provides or receives. Measure A2.5.3. CHARLIE 3 includes being prepared to react to requests for assistance from both local authorities and other installations in the region. Measure A2.5.4.2. CHARLIE 4.2 implements procedures to expedite the entry of first and emergency responders onto the installation during emergencies, while ensuring these procedures prevent unauthorized entry. Measure A2.5.10. CHARLIE 10 reduces vulnerability to attack by consulting local authorities about closing public (and military) roads and facilities and coordinate any other precautionary measures taken outside the installation perimeter.

Findings

- Entry points must balance the safety of the base and access efficiency. The Bellevue Gate helps traffic flow and convenience, but it must be staffed appropriately.
- As funding becomes available, the 55th SFS will continue to increase security measures and upgrade the gate in the future.
- The Bellevue Gate was closed for three months due to staffing shortages.
- The future of the Bellevue Gate is uncertain and may be closed again in the future if deployment is required.

5.3 Biological Resources (BIO)

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

Key Terms

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

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

Copper Sulfate treatment is a chemical control measure to treat water to remove some type of invasive species. Copper sulfate treatment is found to be toxic to invertebrates such as snails and mussels.

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

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

ISSUE BIO-1	**Zebra mussels in Base Lake**
	An infestation of invasive zebra mussels has been introduced into Base Lake and previous eradication measures did not address re-infestations of the species.

Compatibility Assessment

Lake Offutt, or Base Lake, is a man-made lake on the east side of Offutt AFB formed from dredging for construction materials. The lake is about 113 acres and has an average depth of 15 feet. Base Lake has multiple uses; it is used in runoff and drainage management and for recreational purposes.

In April 2006, the Nebraska Game and Parks Commission confirmed that Base Lake had a zebra mussel infestation. Zebra mussels (*Dreissena polymorpha*) are an invasive species that are easily transported and have few natural predators in Nebraska. In an attempt to eradicate the zebra mussels, two treatments of copper sulfide were applied to Base Lake, one in September 2008 and again in April 2009. However, zebra mussels were again discovered in Base Lake in May 2013.

One of the problems in battling zebra mussels is that Base Lake cannot be completely drained because the water table from the Missouri River is too high and the lake refills. It would be easier to get rid of the mussels if the lake could drain and the ground could freeze in the winter.

The Base uses this lake in runoff water / drainage management. When the Base releases water from the lake, it naturally flows into the Missouri River. Due to the zebra mussel infestation, Offutt AFB cannot release water because the mussels would then flow into the Missouri River and could

negatively impact other species and water resources. In addition, when the lake is used for recreational purposes, zebra mussels can get into boat engines causing maintenance issues with boat operability. If transmission of zebra mussels via boats is found to be a primary cause in the spread of zebra mussels and are not inspected for mussels, then the zebra mussel issue will continue to be a problem and may result in increases in permit fees and clean-up fees. Zebra mussel infestation can cause delays in runoff water / drainage management for the Base and impede recreational opportunities for visitors of Base Lake.

Zebra mussels in Base Lake

Existing Tools

Recommended Statewide Boaters Inspection Program

The reemergence of zebra mussels has experts at the University of Nebraska-Lincoln recommending a statewide boat inspection program. These types of programs already exist in other states, such as Colorado, California, and Minnesota, to prevent the spread of zebra mussels. Many boaters at high-risk water bodies in Nebraska support aquatic invasive species prevention.

Legislative Bill 142

The Nebraska Legislature passed Legislative Bill 142 in March 2015, which created an aquatic invasive species prevention program. The Bill includes establishing a fee paid by boat owners at the time of registration or renewal. The fee also applied to boat owners from out of state, who must pay the fee before launching into any waters of the state. The new fee is intended to help pay for water monitoring, education and research, additional staffing for the Nebraska Game and Parks Commission, and decontamination equipment.

Offutt AFB Integrated Natural Resources Management Plan (INRMP)

Section Six of the Offutt AFB Integrated Natural Resources Management Plan covers Invasive Species Management. Zebra mussels are the primary invasive species of concern at Offutt AFB. The plan details the steps taken to treat the lake with copper sulfate. Following the treatment of the lake with copper sulfate, the management plan involves monitoring colonization blocks and restricting the use of private boats. The plan states that if zebra mussels are found again, the Nebraska Game and Parks Commission and the US Fish and Wildlife Service will be notified and consulted.

The plan includes one Invasive Species Management Goal to control the occurrence and spread of invasive species on-base. An objective for achieving the goal includes controlling the spread of any current infestations using chemical, mechanical, and physical methods.

The INRMP was completed before the reemergence of the zebra mussels in 2013, so it does not address any future actions to eliminate the current zebra mussel infestation in Base Lake.

Zebra Mussel Eradication Project

URS Group, Inc. (URS) was contracted by Offutt AFB in 2008 to eradicate the zebra mussels in Base Lake using a copper sulfate treatment. URS conducted multiple pre-application activities including public outreach activities, a distribution SCUBA survey, and pre-treatment data collection. Also, monitoring of both fish and zebra mussels was conducted following the treatment. The treatment was considered effective at the time and future recommendations included:

- Require all watercraft to be decontaminated prior to entering and upon exiting Base Lake. All bilges and live wells should be drained, the boat should be checked and weeds removed.
- The boat should be cleaned using a steam cleaner with a temperature setting of at least 140°F. All live wells and bilges should be sprayed with a 10 percent bleach solution.
- Boats should not be stored in the water for an extended period of time. All personal boats should be removed from the lake daily to reduce the potential for zebra mussels to attach to the boat.

Nebraska Invasive Species Council

To help Nebraska Game and Parks Commission and NDEQ better manage zebra mussels (and other aquatic invasive species) in the future, the Nebraska Invasive Species Program (and Advisory Council) was created. The Nebraska Invasive Species Council (NISC) was formed in 2012 by the Nebraska Legislature to serve as an advisory council for state invasive specifies policy and to coordinate management and research efforts across the state focused on preventing, detecting and managing invasive species. The Nebraska Invasive Species Program coordinates the council and provides outreach, management and research information to the public and stakeholders.

The zebra mussel is identified on the NISC website as one of the more prominent invasive species in Nebraska's freshwater lakes, ponds, and slow-moving rivers. According to the NISC, the prominent location of the zebra mussel is in Base Lake, as well as in the Missouri River. Several of the preventative steps identified by the NISC include cleaning, draining, and drying a boat, before and after use.

In the summer of 2014, NISC technicians asked boaters within high risk water bodies if they were willing to support an increase in boater registration fee, which would support aquatic invasive species prevention and management (a possible boat inspection program). Of the roughly 1,800 participants surveyed, approximately 90 percent supported the increase in fees to fund a program of that nature. According to NISC, with interstate boat travel, especially along the Missouri River, a boat inspection program is needed to educate the public and instruct boat owners on how to clean, drain, and dry their boats.

Findings

- INRMP does not address future re-infestations of zebra mussels in Base Lake.
- There was an attempt to eliminate zebra mussels in Base Lake through two separate injections of copper sulfate treatment; however, the mussels reemerged in May 2013.
- The recommendations from the zebra mussel eradication project report should be assessed for efficiency.
- The boat inspection program has been identified as a potential solution by NISC to help prevent the spread of zebra mussels.

ISSUE BIO-2	**Bird migratory routes** Offutt AFB is within an important bird migratory route and many species of birds travel through the region during migration seasons. The presence of birds near the runway and within flight tracks presents potential dangers to pilots and aircraft.

Compatibility Assessment

Offutt AFB is located within part of the Mississippi Flyway, a major migratory bird corridor in the US. Flyways are routes migratory birds take to get from the southern winter feeding grounds to the northern summer breeding grounds and back. Flyways generally occur along coastlines or major rivers, which provide habitat for birds to rest. More than 325 different species of birds make the trip each year along the Mississippi Flyway.

Various species of birds may be found at Offutt AFB, which travel through the Flyway and utilize the resting habitat found on and around the base. Songbirds, such as robins, swallows, and sparrows, can be found throughout the region. Migratory waterfowl, such as ducks, geese, and swans, travel during spring and fall in large flocks. Raptors, such as hawks, eagles, owls, and kites, are found at Offutt AFB and the surrounding area.

Birds are a major aspect of ecosystems, controlling the insect population and distributing seeds. Bird watching is also a popular recreational activity. Resting habitat is necessary to maintain the migratory bird population. Many of the areas utilized by migratory birds are threatened by fragmentation or loss of habitat due to urbanization and agriculture. Even though most birds can change their migratory paths, certain migratory birds, such as geese and swans, are committed to their stopover sites and cannot change them. With a narrowing habitat, many birds take refuge at Offutt AFB and the surrounding areas.

Collisions with birds on the ground or in the air are dangerous for pilots, people on the ground, and aircraft operations in general. Many areas on and near Offutt AFB, including lakes, rivers, and wetlands provide ideal habitat for both local and migratory birds, which pose a high Bird / Wildlife Aircraft Strike Hazard (BASH) threat. Agricultural fields and golf courses surround the approach and departure corridors, providing feeding and roosting grounds. Offutt AFB is less than two miles west of the Missouri River, which is a major migratory flyway. Additionally, the 1,500-acre Schilling Wildlife Management Area is located approximately four miles south of the base and the 1,300-acre Gifford Point Wildlife Management Area is roughly four miles northeast of the base. These sanctuaries provide protected habitat for millions of migrating waterfowl. Figure 5.3-1 shows all BASH areas within the BASH Relevancy Area and surrounding the BASH Area. It is important to note that the agriculture land uses identified on the map include Sarpy County's existing land use data and Mills County zoning data. The existing land use data for Mills County was unavailable at the time of this report. With that said, the agricultural land within the BASH Area comprises 19,973 acres, which is abundant when referring to BASH-related issues. Agricultural land is of concern relative to BASH due to various reasons including the types of crops grown (i.e., does the crop attract wildlife) on agricultural land and irrigation practices. If the land is not irrigated appropriately and pools of water or standing water occurs in this area, then this can attract increased numbers of birds and wildlife to this high risk area. This is a concern to Offutt AFB and the military as BASH incidents can be extremely costly.

A collision in 2005 involving an E-4B aircraft and a Canada goose resulted in over eight million dollars in damage to the aircraft and prompted an effort to improve the Offutt AFB BASH program. After changing the focus of the BASH program, it was recognized as "Best in Air Combat Command" in 2012. Offutt AFB strives for the elimination of all bird strikes, but this goal is considered impractical and has never been attained at any installation. This area as shown by Figure 5.3-1 and this area being located in the Mississippi

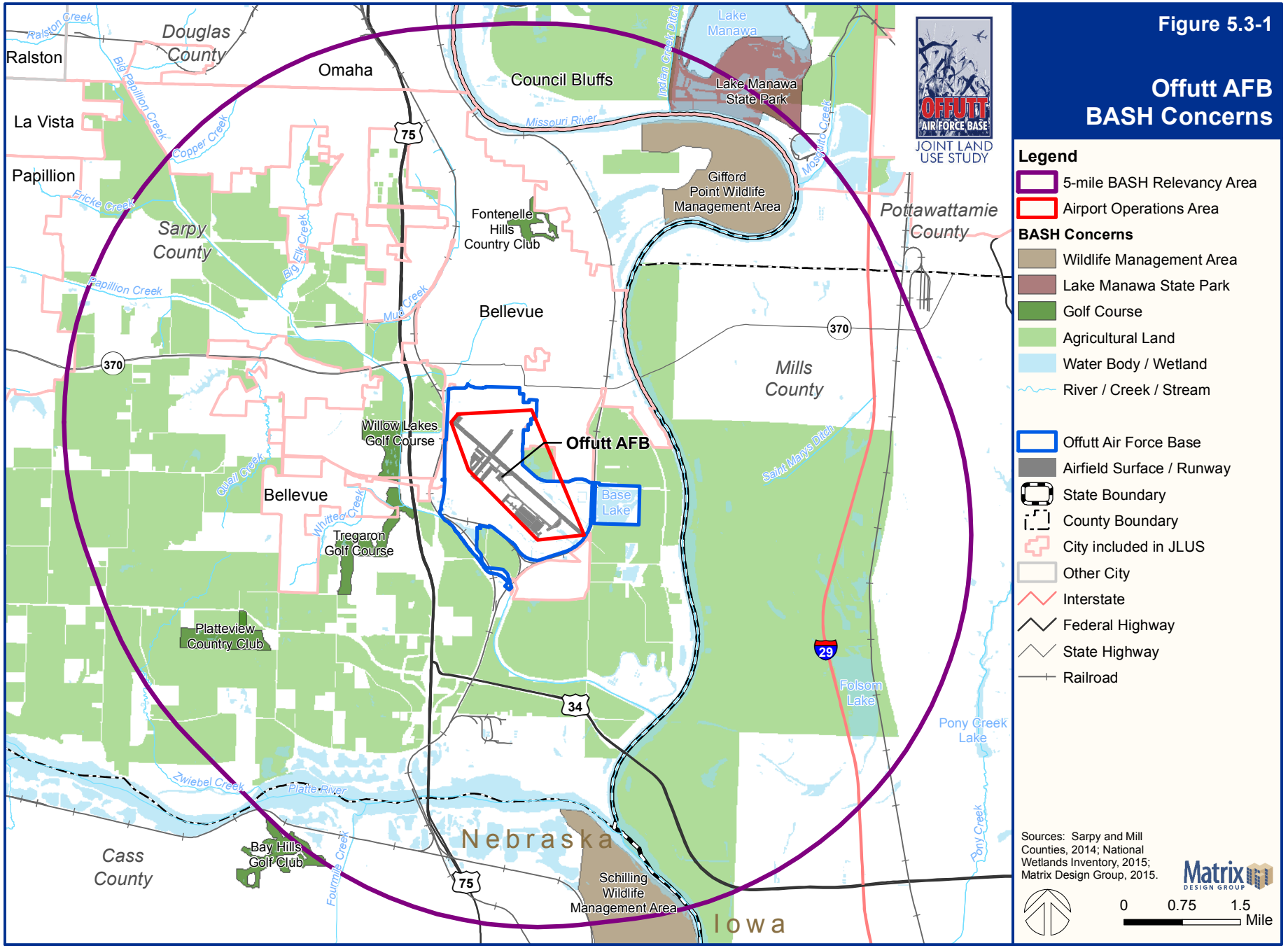


Figure 5.3-1
Offutt AFB
BASH Concerns
OFFUTT AIR FORCE BASE
JOINT LAND USE STUDY
Legend
5-mile BASH Relevancy Area
Airport Operations Area
BASH Concerns
Wildlife Management Area
Lake Manawa State Park
Golf Course
Agricultural Land
Water Body / Wetland
River / Creek / Stream
Offutt Air Force Base
Airfield Surface / Runway
State Boundary
County Boundary
City included in JLUS
Other City
Interstate
Federal Highway
State Highway
Railroad
Douglas County
Sarpy County
Cass County
Pottawattamie County
Mills County
Ralston
La Vista
Papillion
Omaha
Council Bellevue
Bellevue
Bellevue
Offutt AFB
Base Lake
Lake Manawa
Lake Manawa State Park
Gifford Point Wildlife Management Area
Fontenelle Hills Country Club
Willow Lakes Golf Course
Tregaron Golf Course
Platteview Country Club
Bay Hills Golf Club
Schilling Wildlife Management Area
Folsom Lake
Pony Creek Lake
Missouri River
Platte River
Nebraska
Iowa
Sources: Sarpy and Mill Counties, 2014; National Wetlands Inventory, 2015; Matrix Design Group, 2015.
Matrix DESIGN GROUP
0 0.75 1.5
Mile

Flyway is a location where BASH is inevitable. Bird strikes at Offutt AFB have caused costly damage to some aircraft as shown in Table 5.3-1. In 2014, there were 49 bird strikes at Offutt AFB, which totaled $287,464 in damage. Although most strikes are perching birds, the strikes that cause the most damage are raptors and waterfowl.

Table 5.3-1 BASH Incidents and Costs

Year	Number of Strikes	Cost
2004	N/A	$536,320
2005	N/A	$8,115,981
2006	N/A	$83,319
2007	N/A	$76,651
2008	N/A	$71,668
2009	N/A	$77,901
2010	N/A	$30,000
2011	93	$29,454
2012	78	$60,816
2013	68	$765,510
2014	49	$287,464

Source: Offutt AFB BASH data Briefing

Existing Tools

Executive Order 13186

Executive Order 13186 requires that federal agencies protect migratory birds. If the agency's actions have a measurable negative effect on migratory bird populations, a memorandum of understanding must be in place with the US Fish and Wildlife Service to promote the conservation of migratory bird populations. The order also sets the parameters for establishing a Council for the Conservation of Migratory Birds.

Integrated Natural Resources Management Plan

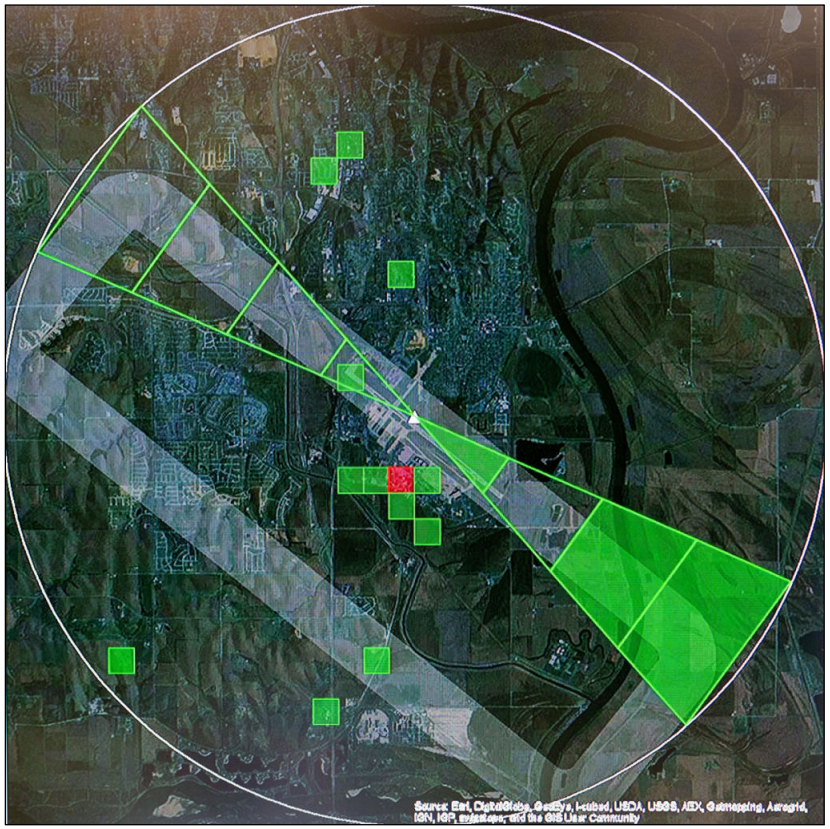
Section 6 of the INRMP, involves protecting and improving wildlife species through habitat management. Management is achieved by providing vegetation on-base without creating conditions likely to cause bird aircraft strike hazards. One of the management objectives includes the protection of migratory birds and waterfowl. Threatened and endangered program objectives involve obtaining the federal list of Migratory Birds of Conservation Concern and ensuring compliance with statutes and regulations that govern migratory bird conservation.

Bird Aircraft Strike Hazard Program

The Offutt AFB BASH program is focused on identification, environmental modification and mitigation while utilizing technology and innovation. The program is run by a BASH team, composed of individuals from the US Department of Agriculture and active duty members of the Air Force and Air National Guard. The program also involves community support and participation, including a network of local farmers, homeowners, and business owners within a five mile radius of the airfield. The participating landowner not only reports changes in bird activity, but allows the BASH team to enter their property and mitigate the hazard. This BASH program is a good model for other BASH programs and for military compatibility planning as there is an active community component to this program for Offutt AFB.

In order to make the base less attractive to the birds, efforts have been made to modify the environment the birds use. Mitigation activity on-base includes tree removal, herbicide / pesticide combination, and small mammal control. Shotguns and pyrotechnics are often utilized to drive birds away from the airfield. In 2011, Offutt added a Long Range Acoustic Device (LRAD) which projects sounds up to two kilometers away to deter birds from the area. In 2014, the BASH team added a new radar system, the

MERLIN SS200m Aircraft Birdstrike Avoidance Radar System. The state-of-the-art device provides enhanced data that allows for more accurate assessments of BASH conditions. The new system also collects the data and automatically creates reports and charts.



Screenshot of computer readout data from Offutt AFB's MERLIN SS200m Aircraft Birdstrike Avoidance Radar System. Each square represents groups of birds, from 1-10, 11-20, and more than 20.

Federal Aviation Administration Advisory Circular 150/5200-33B

The FAA developed an advisory notification about Hazardous Wildlife Attractants on or near Airports in 2007. This advisory circular (AC) indicates that to protect the approach, departure, and circling airspace of an airport, the BASH Concern area should be measured five statute miles from the AOA and the hazardous wildlife attractant. In addition, this circular identifies different separations for different airports, i.e. for airports serving piston-powered aircraft; the recommended FAA separation distance is 5,000 feet from the airport's AOA and the hazardous attractant.

It is important to note that if the airport is managed the Air Force / DOD, then the BASH Plan and the AOA or BASH Concern area that the AF has assessed and determined to be relevant would prevail. This AC is guidance provided by FAA and would prevail for commercial airports. However, it is recommended to use this FAA guidance when assessing BASH concerns.

US Avian Hazard Advisory System

The US Avian Hazard Advisory System (USAHAS) is an online GIS tool that monitors bird activity and forecasts bird strike risk using weather radar and bird movement models. The AHAS provides Air Force pilots with a near real-time decision making tool to help reduce the risk of bird collisions with aircraft. The system provides a risk level of low, moderate, or severe, which is based on the amount of birds in a square kilometer spatial area. The AHAS also incorporates predictive models and historical information to determine current bird activity. It is recommended that pilots do not fly within a severe zone unless it is mission essential.

City of Bellevue AICUZ Overlay District

Section 5.29.07 of the City of Bellevue Zoning Ordinance regulates land uses for the area identified in the AICUZ Overlay District. This overlay district adopts the 1992 Offutt AFB AICUZ Report recommended land use table, which includes recommendations to avoid land uses that attract birds, i.e., agriculture should be compatible with exceptions due to the types of crops that can be grown and attract wildlife and birds. Land uses that should be

avoided in areas near the airfield include landfills, feeding stations, or the growing of certain vegetation. These regulations are applicable to all new development, and any change, expansion or addition of an existing structure or development.

Sarpy County Airport Approach Zone District

The Airport Approach Zone District in Section 27 of the Sarpy County Zoning Ordinance is appended to primary zoning districts and places some restrictions on land use under approach zones. Section 27.4.3 prohibits the use of land that allows the dumping of garbage, maintenance of feeding stations, or facilities attractive to birds.

Findings

- As birds lose habitat to urbanization and agriculture, Offutt AFB provides a resting sanctuary for migratory birds along the Mississippi Flyway.
- Protection of migratory bird habitat benefits the ecosystem, but causes BASH concerns.
- Offutt AFB is located in the Mississippi Flyway, a high traffic corridor for migrating birds.
- Offutt AFB has a comprehensive BASH program, which involves environmental control, mitigation, and participation beyond the base.
- The BASH program is effective and includes state-of-the-art technology and equipment; however, bird strikes have not been eliminated and continue to occur at Offutt AFB.
- The Offutt AFB BASH program has an active community component where the community is engaged in assisting the military to reduce BASH incidents through reporting bird activity and the permission of Offutt AFB personnel on their property to assess and help mitigate the bird attractants.
- City of Bellevue and Sarpy County have land use restrictions in the overlay districts that reduce uses that attract birds.

5.4 Climate Adaptation (CA)

Climate adaptation is the effort to prepare for future climate changes resulting from natural factors and human activities that influence long-term atmospheric conditions. The effects may include fluctuations in sea levels, storm and tidal surges, and changes in flood potential which can present operational and planning challenges for the military and communities.

Key Terms

Climate Change. Climate change refers to any significant change in the measures of climate lasting for an extended period of time. In other words, climate change includes major changes in temperature, precipitation, or wind patterns, among other effects, that occur over several decades or longer.

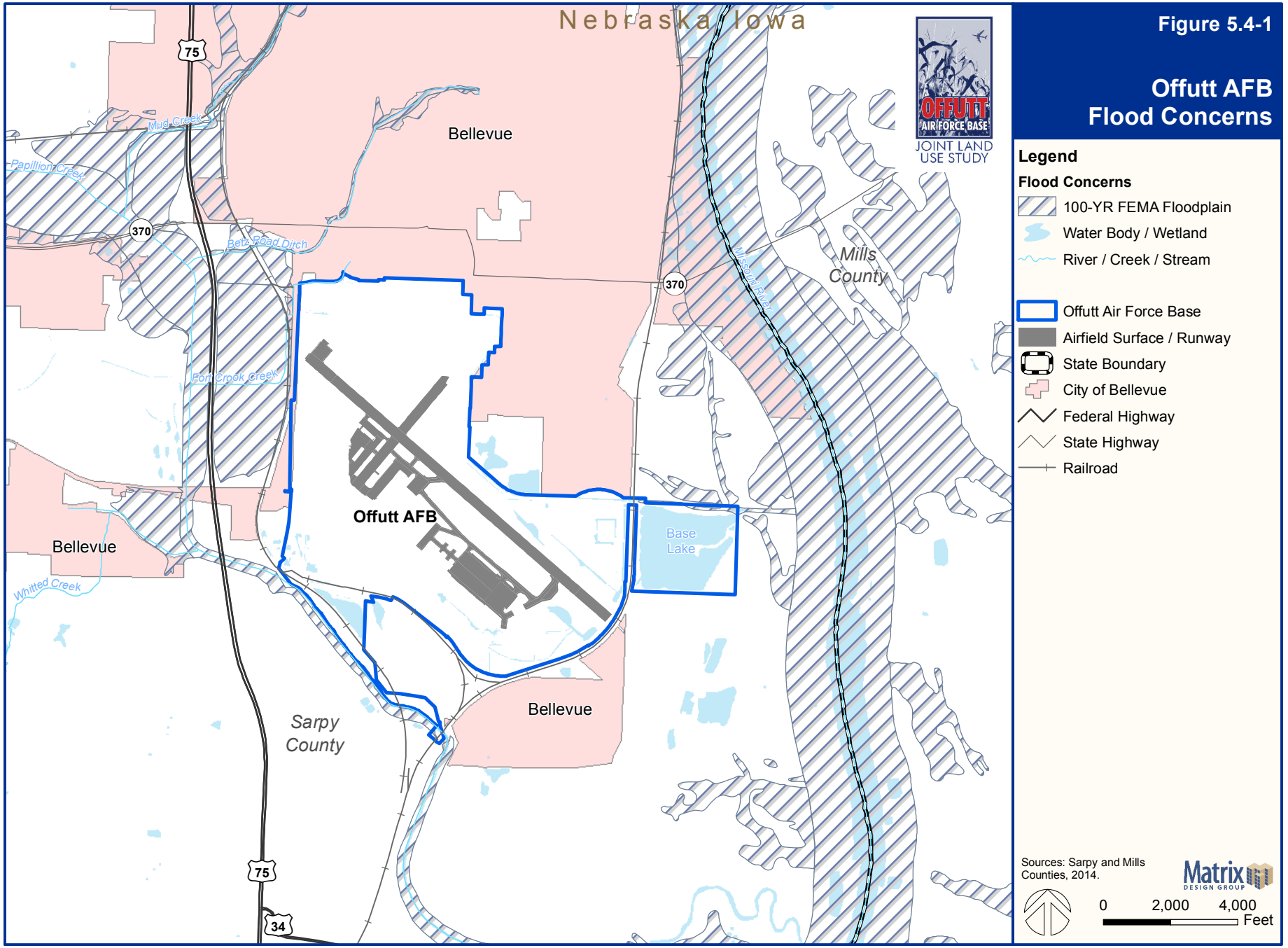
ISSUE CA-1	**Potential wetland flooding at Offutt AFB**
	There are 14 wetlands that cover 147 acres on Offutt AFB that are regulated by the US Army Corp of Engineers (USACE). The base's location next to the Missouri and Platte Rivers also puts it in close proximity to floodzones. During heavy rainfall, this area is prone to flooding, and flooding onto Offutt AFB may cause delays in missions and operations.

Compatibility Assessment

Climate change has increased the frequency, risk, and intensity of extreme weather events, including heavy downpours and flooding from intense precipitation. In addition to the change in weather events, wetlands have been lost to an increase in development. This change has the potential to impact the flooding on Offutt AFB. Figure 5.4-1 shows the wetland/flood plains located on Offutt AFB.

Heavy rainfall events associated with climate change can be intensified by urbanization, with large areas covered with parking lots, roads, and buildings increasing the risk of flooding. In urban areas, rain hits more impervious surfaces, which channels water into rivers and drainage systems. As the Omaha metropolitan area continues to expand, much of the run-off gets funneled into the Missouri River.

In 2011, the area around Offutt AFB experienced unprecedented and prolonged flooding due to heavy rains, a large amount of snowmelt late in the season, and the releasing of water from dams upriver that led to the overflowing of the Missouri River. The Missouri River remained above flood stage for a record of 101 consecutive days from June 1 to September 10 and resulted in hundreds of millions of dollars in damages to the region. In some areas, floodwaters peaked at more than 35 feet. Offutt AFB personnel and members from the local community worked diligently to protect the base from flooding so that mission operations would not be impacted. Millions of dollars were spent on sand bags and other protective measures to supplement the levees that protect the base from the Missouri River and other areas that were flooding. Offutt personnel also assisted local communities in protection efforts of civilian areas and homes. Through the collaborative efforts of Offutt AFB, the US Army Corps of Engineers, local communities and the Papio-Missouri River Natural Resources District, no major impacts to Offutt's missions were experienced.


Nebraska Iowa
Bellevue
Mud Creek
Papillion Creek
Betz Road Ditch
Fort Crook Creek
Missouri River
Mills County
Offutt AFB
Base Lake
Bellevue
Whitted Creek
Bellevue
Sarpy County
75
370
370
75
34
OFFUTT AIR FORCE BASE
JOINT LAND USE STUDY
Figure 5.4-1
Offutt AFB Flood Concerns
Legend
Flood Concerns
100-YR FEMA Floodplain
Water Body / Wetland
River / Creek / Stream
Offutt Air Force Base
Airfield Surface / Runway
State Boundary
City of Bellevue
Federal Highway
State Highway
Railroad
Sources: Sarpy and Mills Counties, 2014.
Matrix DESIGN GROUP
0
2,000
4,000
Feet

Missouri River flooding around Offutt AFB, July 2011

In May 2014, the CNA Corporation Military Advisor Board (MAB), a nonprofit research and analysis organization, released a report on National Security and the Accelerating Risks of Climate Change. Improved models, better data collection, and satellite monitoring have all increased scientific confidence of the future effects of climate change. There continues to be disagreement and debate regarding climate change; however, the risk is so great that the MAB encourages immediate action. The prediction of increased intensity and frequency of extreme weather events would have a large impact on military demand and readiness. Heavy rainfall events at Offutt AFB could restrict access to the base, flight operations, and other training activities and could cause damage to the base and military equipment.

Existing Tools

Integrated Natural Resources Management Plan

The Offutt AFB INRMP contains two goals to monitor and protect wetlands from destruction and development. Objectives include:

- Review all proposed construction projects for possible wetland impact.
- Study feasibility of establishing new wetlands south of the STRATCOM Gate.
- Study possible future areas for wetland banking and enhancement.
- Ensure that all applicable wetlands laws and Air Force instructions are adhered to and the wetlands are protected.
- Regularly check wetland conditions trends and boundaries.

Back to the River

Back to the River is a non-profit organization committed to promoting access to both sides of the Missouri River and focuses on education, economic development, environmental protection and archeology. The group also looks at flood control and wants to acquire the land south of Offutt AFB. They would give it to the State Games and Parks Department to establish a wildlife management area, with bird restrictions for BASH.

Executive Order 11990, Protection of Wetlands

Executive Order 11990 directs each agency to provide leadership and take action to minimize the destruction, loss or degradation of wetlands, and to preserve and enhance the natural and beneficial values of wetlands.

- (1) Acquiring, managing, and disposing of federal lands and facilities.
- (2) Providing federally undertaken, financed, or assisted construction and improvements.
- (3) Conducting federal activities and programs affecting land use, including but not limited to water and related land resources planning, regulating, and licensing activities.

Findings

- The prediction of increased intensity and frequency of extreme weather and rain events could restrict access to the base, flight operations, and other training activities and could cause damage to the base and military equipment.

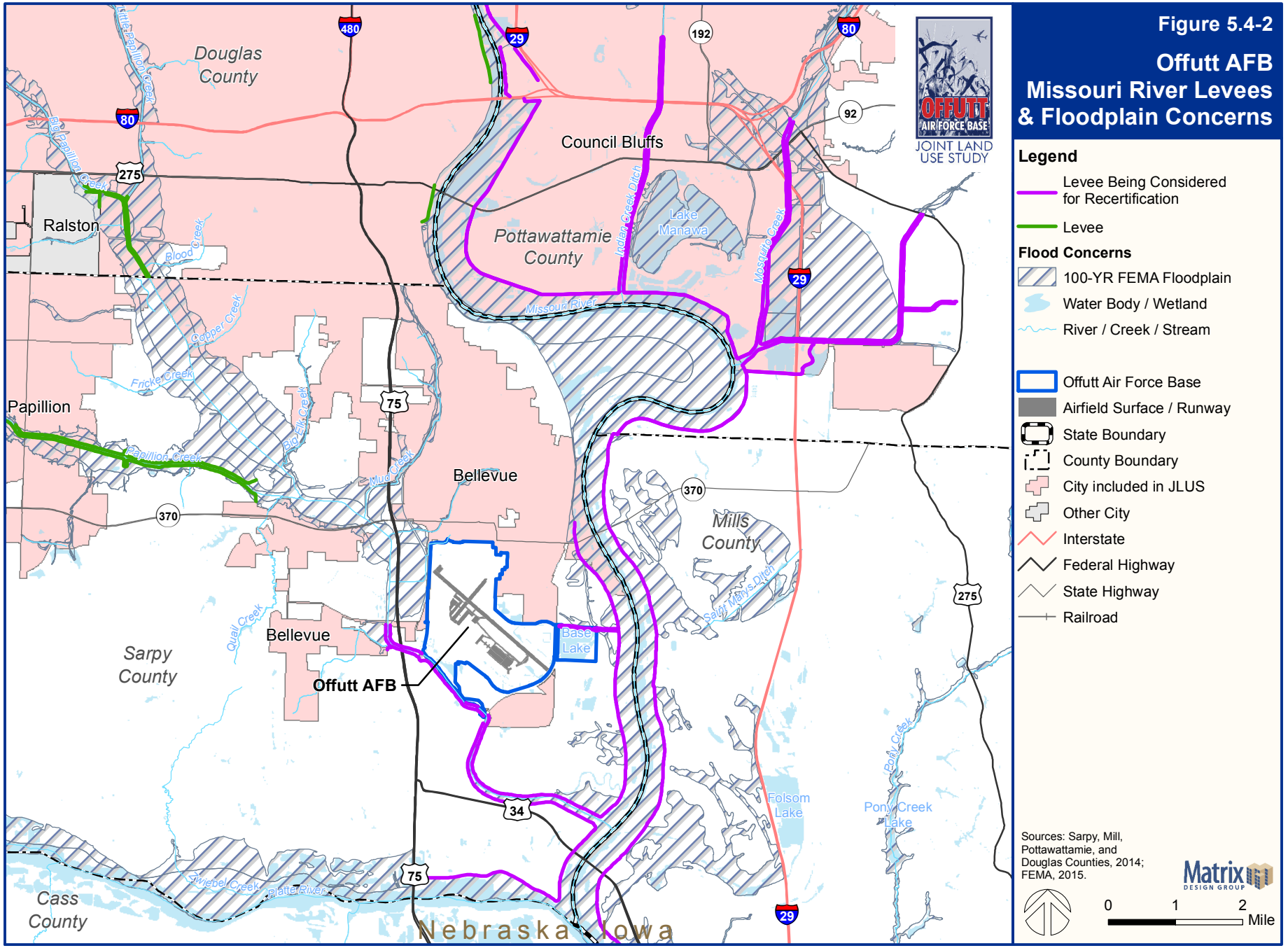
ISSUE CA-2	**Recertification is required for the levee system around Offutt AFB** Due to changes in the base flood elevation of the Missouri River, Federal Emergency Management Agency (FEMA) has identified the need to raise the levee between two inches to several feet for it to be capable of protecting the installation. The Papio-Missouri River Natural Resources District has been notified by FEMA, that if the levee is not fixed by 2017, the levee will be de-certified.

Compatibility Assessment

Offutt AFB is located in a floodplain west of the Missouri River, but the base is protected by levees constructed in the 1960s by the Army Corps of Engineers. The levees are between 11 and 12 feet tall and have been built to withstand a 100-year flood. Figure 5.4-2 shows the levees and floodplain protected by the levees.

Between May and August 2011, the Missouri River experienced widespread flooding. The flooding was caused by the late melting of record-setting snow throughout the Rocky Mountains and Northern Plains paired with record-setting rainfall. The levees protecting Offutt AFB were reinforced and raised with sandbags which held back the river and prevented flooding on base. Even though Offutt AFB managed to avoid flooding, the Army Corps of Engineers reported that the flood caused $630 million in damage to the levees, dams, and channels that control the Missouri River.

The Federal Emergency Management Agency has changed its models and developed new standards for the levees, taking the increased runoff into consideration. It was determined the levees do not meet the new standards and will need to be raised to be recertified by 2017. A portion of the


Douglas County
Council Bluffs
Pottawattamie County
Ralston
Papillion
Bellevue
Bellevue
Mills County
Sarpy County
Offutt AFB
Cass County
Nebraska
Iowa
Lake Manawa
Base Lake
Folsom Lake
Pony Creek Lake
Missouri River
Platte River
Papillion Creek
Big Papillion Creek
Little Papillion Creek
Blood Creek
Copper Creek
Fricke Creek
Big Elk Creek
Mud Creek
Quail Creek
Swiebel Creek
Indian Creek Ditch
Mosquito Creek
Saint Marys Ditch
Pony Creek
OFFUTT AIR FORCE BASE
JOINT LAND USE STUDY
Figure 5.4-2
Offutt AFB
Missouri River Levees
& Floodplain Concerns
Legend
Levee Being Considered for Recertification
Levee
Flood Concerns
100-YR FEMA Floodplain
Water Body / Wetland
River / Creek / Stream
Offutt Air Force Base
Airfield Surface / Runway
State Boundary
County Boundary
City included in JLUS
Other City
Interstate
Federal Highway
State Highway
Railroad
Sources: Sarpy, Mill, Pottawattamie, and Douglas Counties, 2014; FEMA, 2015.
Matrix DESIGN GROUP
0 1 2 Mile

R616 levee is located on Offutt AFB property and if the levees are not recertified, it would impact the ability of the base to seek any new missions. While not all of these levees directly protect Offutt AFB, they do protect the lands around Offutt AFB.

Recertification of the Missouri River R-616/R613 and Papio Creek levees will cost an estimated $25 million. It is anticipated that funding from the State of Nebraska, federal government, Sarpy County, City of Bellevue, City of Omaha and the Papio-Missouri River Natural Resources District will fully fund this $25 million federal mandate. As of August 2015, the Papio-Missouri River Natural Resources District and its partners are organizing and negotiating funding sources and percentages to assist in completing this vital flood control project.

Existing Tools

Integrated Natural Resources Management Plan

The purpose of floodplain management is to manage the floodplain resources to reduce the risk of flood loss, minimize impacts of floods on human safety, health, and welfare, and preserve and enhance the natural and beneficial values of floodplains. Development activities that occur in a floodplain must be evaluated for impacts using the Environmental Impact Analysis Process delineated in AFI 32-7061. If floodplains would be affected, practicable alternatives need to be identified that would satisfy the purpose and need of the project and would not impact floodplains. One of the floodplain goals included in the INRMP involves maintaining floodplain assessment and mapping. Objectives for achieving this goal include:

- Ensure recent National Flood Insurance Program (NFIP) mapping update does not impact mapping on Offutt AFB (Partner with the USACE on this effort).
- Maintain floodplain mapping in geographic information systems (GIS).
- Protect any floodplains located on US Air Force property.

Back to the River

Back to the River's potential uses for the area between the Missouri River levees includes: wetland enhancement and/or mitigation, and stormwater management. These uses of the impacted area will require design, construction and long-term monitoring in order to prevent further impacts from occurring.

Executive Order 11988, Floodplains Management

Executive Order 11988 issued by the Federal Emergency Management Agency directs each federal agency to provide leadership and take action to reduce the risk of flood loss, to minimize the impact of floods on human safety, health and welfare, and to restore and preserve the natural and beneficial values served by floodplains. Agencies are responsible for:

- Acquiring, managing, and disposing of Federal lands, and facilities.
- Providing federally undertaken, financed, or assisted construction and improvements.
- Conducting Federal activities and programs affecting land use, including but not limited to water and related land resources planning, regulating, and licensing activities.

Findings

- The levee system protects Offutt AFB from flooding.
- Due to urbanization and potential climate change impacts, there is an increased risk of flooding.
- FEMA has identified the need to raise the levee between two inches to several feet for it to be capable of protecting the installation.
- If the levees are not recertified it would impact the ability of the base to seek any new missions.

5.5 Communication / Coordination (COM)

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

ISSUE COM-1	**Lack of public awareness about Offutt AFB mission requirements** While there is a good relationship between Offutt AFB and its surrounding communities, there is no formal communication process for informing nearby residents of the activities that occur at the base. This is especially important during unique activities that do not occur on a regular basis, such as emergency management training or disaster simulations.

Compatibility Assessment

Offutt AFB maintains a relationship with the surrounding communities through public events. Each year Offutt AFB works with the Bellevue Chamber of Commerce to conduct a seven-mile race around the base and down the runway, called the Runway Run. Another event at the base is the Defenders of Freedom Open House and Air Show. The event features air performers, static displays, and exhibitors and attracts a crowd of 150,000 to 200,000 people to the base. The open house and show give the public an opportunity to see what happens on the base.

These events help maintain the relationship between the base and the community; however, there is a lack of notification to surrounding residents regarding operational activities. This is especially important when operations occur outside of regular training hours or when an emergency drill is conducted. Residents can find limited information about noise-generating activities on the Offutt AFB website. However, there are no notifications made to the public for operations that occur outside the normal training schedule.

Existing Tools

Offutt Advisory Council

The Offutt Advisory Council (OAC) is made up of representatives from Offutt AFB, the cities of Bellevue, Papillion, Omaha, and Plattsmouth, and Sarpy County. The council meets once a month to discuss events on-base and in the communities. The OAC does not discuss base operations or the impact operations have on the surrounding community.

Offutt AFB Social Media

Offutt AFB has a Facebook page with over 18,000 likes and a Twitter account with about 3,000 followers. These accounts are used mostly for announcing gate closures, events, and opportunities along with awards and promotions. Offutt AFB does not utilize this presence for posting operational events or changes that may cause disruption to the general public.

Offutt AFB Website (http://www.offutt.af.mil/)

The Offutt AFB website has a lot of information, including the phone number for the base operator and a link to the Offutt Phone Directory. However, there is nothing on the main page of the website for noise complaints or public affairs. To find that information, the "Questions" link at the top of the page must be clicked. Then one needs to visit the Air Combat Command Questions page to find a link for noise complaints. The noise complaints link features directions to file a noise complaint against an Air Force aircraft:

> *Contact the local Air Force base public affairs office. The public affairs office will help you deal with the issue. If the base public affairs is not able to assist you, please contact ACC Public Affairs at (757) 764-5994.*

Phone numbers for the 55th Wing and USSTRATCOM Public Affairs can be found in the Offutt Phone Directory.

Findings

- Offutt AFB hosts two events to maintain and strengthen its relationship with the surrounding community.
- There is a lack of formal notification to the community when training and drills occur outside of normal operating procedures.
- Social media is used mostly for announcing gate closures, events, and opportunities along with awards and promotions.

ISSUE COM-2	**Formalize communication and coordination between Offutt AFB and communities regarding new development** There is a need for formal agreements or standard processes for including the Air Force in the review and approval of community development projects proposed within the JLUS Study Area. Although some communication occurs through an informal process, the lack of a designated point of contact and standard process that outlines response times and stakeholder responsibilities have resulted in a nominal response rate.

Compatibility Assessment

While Offutt AFB and local communities do engage in informal verbal and electronic communication on certain matters, formal agreement establishing delineated points-of-contact assigned to critical positions, associated contact information, or the roles and responsibilities for each affected agency within the JLUS Study Area has not been established with all jurisdictions. Unlike jurisdictions within the JLUS Study Area, the City of Bellevue does require a formal development review process and has a designated point of contact. The Offutt Community Planning Officer has had to monitor activity and development in some jurisdictions to find out about potential changes in the area. Relationships between community leaders and Offutt are further constrained by changes to and reorganization of military personnel.

It is important that the surrounding jurisdictions include Offutt AFB in the review of proposed development plans, especially when it may impact base operations. The review allows for the evaluation of impacts the proposed development could have on missions at Offutt AFB or vice versa. The jurisdictions may be unaware a proposed development is incompatible, which could threaten the future of the base. When Offutt AFB is consulted before incompatible development occurs, there is a better chance of issues being mitigated before construction begins.

The City of Bellevue and Sarpy County are the only jurisdictions that have overlay districts to restrict development that is non-compatible with Offutt AFB.

Existing Tools

City of Bellevue

AICUZ Overlay District

Section 5.29.04 of the City of Bellevue Zoning Ordinance regulates development permits in the CZs, APZs, Noise Zones, and Height Obstruction areas. An Enforcement Officer is designated by the City Council to be responsible for the following:

- Review all development permits to assure that the permit requirements of the zoning ordinance have been satisfied.
- Review permits for proposed development to assure that all necessary permits have been obtained from those federal or state governmental agencies from which prior approval is required.

- Notify the Base Civil Engineer at Offutt Air Force Base for comments on the proposed development and its conformance with the standards as set forth in the AICUZ Report and the requirements of the zoning ordinance.

This AICUZ overlay district establishes the formal communication with Offutt AFB for development review that may be located in safety and noise sensitive zones. This is a good example of formal communication between the AF and the community.

Sarpy County

Airport Approach Zone District

The Airport Approach Zone District in Section 27 of the Sarpy County Zoning Regulations controls land uses and federal and state height requirements under airport approach zones. Permitted uses in the district include agriculture and utilities. Land uses that promote the gathering of people or assemblies, release any substance which would impair visibility, emit light, create electrical emission, or attracts birds are not allowed.

The Airport Approach Zone District regulates the land uses under airport approach zones; however, it does not establish any formal communication with the Offutt AFB Engineer to review proposed new development.

Findings

- The City of Bellevue designates an Enforcement Officer to ensure plans are reviewed by Offutt AFB, but there is no determined length of time for a response from the base and what steps to take if there is no response. Additionally, a permit for a potentially incompatible use can be approved with a variance from the Board of Adjustment.
- Sarpy County established regulations for development under approach zones; however there is no mention of Offutt AFB or any required review to be conducted by the base.

Please see the next page.

5.6 Cultural Resources (CR)

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

The issue identified for Cultural Resources was classified as a Minor Issue and is found in that section in the beginning of this chapter.

Please see the next page.

5.7 Dust / Smoke / Steam (DSS)

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

Technical Background

Particles of dust and other materials found in the air are referred to as particulate matter. The term PM-10 refers to particulate matter less than ten microns in size. At certain concentrations, this particulate matter can be harmful to humans and animals if inhaled causing strain on the heart and lungs which provide oxygen to the body. PM-10 can be caused by many activities, including driving on unpaved roads and surfaces, wind erosion from unpaved vacant lots, disruption of land from vehicle maneuvers, explosions, aircraft operations, and other earth-moving activities such as construction, demolition, and grading. Its primary source is typically the exhaust emitted by vehicles, wood burning, and industrial processes.

However, prescribed burns, agricultural burning and even wildfires can contribute to the creation of particulate matter. Prescribed burning is intended to eliminate an invasive weed species and restore the areas natural ecosystem. By applying this method, wildfires have a less chance of occurring. This style of burning is required to report the date of the burn, acreage, type of fuel to be used, and the estimated emissions.

Key Terms

Controlled Burn. A controlled burn is a fire applied to a predetermined area with appropriate safety precautions.

Particulate Matter (PM). Particulate matter consists of fine metal, smoke, soot, and dust particles suspended in the air. Particulate Matter is measured by two sizes: Course particles (PM10), or particles between 2.5 and 10 micrometers in diameter in size, and fine particles (PM2.5), or particles less than 2.5 micrometers in diameter.

ISSUE DSS-1	**Burning of native prairie** Controlled burns of native prairie near Offutt AFB may impact pilot visibility.

Compatibility Assessment

Fire is a natural part of grassland ecology, which can be used for prairie restoration. Controlled burns serve many purposes, including improving wildlife habitat, enhancing seed production, and reducing the risk of wild fires. The Schilling Wildlife Area, Nebraska Game and Parks Commission, the Nebraska Department of Natural Resources, and the Iowa Department of Natural Resources all conduct controlled burns to manage land.

The closed pattern Flight Tracks at Offutt AFB consist of low-level altitude flights. Also, pilots flying under visual flight rules (VFR) in Class C airspace must have at least three miles of visibility. Clouds of smoke from controlled burns may impede pilot visibility.

Existing Tools

Iowa Administrative Code

Iowa Administrative Code Section 567-23.2 allows Mills County residents to burn certain items on their property. The ordinance encourages efficient use of fire protection resources, defines controlled and uncontrolled burns, creates uniform procedures for advanced notice of planned open burning, and establishes penalties when an individual fails to provide such notice. Every person, firm, corporation, or government entity is required to provide advance notice to the Mills County Communications Center before burning. By this code, Offutt AFB is required to provide advance notification to the

Mills County Communications Center prior to any prescribed, controlled burns occurring.

Nebraska State Fire Marshal Act

Section 81-520 of the Nebraska Fire Marshal Act outlines the regulations that apply to open burning in Nebraska. There is a statewide burning ban on all outdoor rubbish fires, bonfires, and fires to clear land. The ban can be waived by obtaining an open burning permit, issued by the jurisdiction's fire chief. It is the chief's decision to determine if conditions are appropriate to waive the open burning ban. The application to obtain a permit must include the following information:

- A map showing the areas to be burned, including natural and manmade firebreaks;
- Procedures to be used to confine the fire in boundary areas without preexisting firebreaks;
- A description of weather conditions believed to be required to safely and successfully conduct the range-management burning, including wind speed and direction, temperature, and relative humidity.

While there is good coordination precedent established with this Act, the application does not require coordination with Offutt AFB if the controlled burn is located near the base. This lack of coordination could create unintentional visibility issues for Offutt AFB pilots.

Basic Smoke Management Practices

The US Department of Agriculture Natural Resources Conservation Service has established basic smoke management practices to follow for controlled burning. The practices can be utilized to reduce the impact of smoke from controlled fires. These practices include:

- Evaluate Smoke Dispersion Conditions
- Monitor Effects on Air Quality
- Communication – Public Notification
- Consider Emission Reduction Techniques
- Share the Airshed – Coordination of Area Burning

If the surrounding areas apply these management practices, smoke from controlled burns could have less of an impact on operations at Offutt AFB.

Findings

- There is no required formal coordination between the entities conducting controlled burns and Offutt AFB.

ISSUE DSS-2	**Potential industrial development south of Offutt AFB** The land south of Offutt AFB could be developed with industrial uses that may impact pilot visibility.

Compatibility Assessment

Industrial uses are generally compatible with military operations, which tend to be low density and not noise-sensitive. However, exhaust, steam, and smoke are common byproducts of industrial activity, which can create incompatibility. It is important to ensure that all aspects of compatibility are addressed, including any emissions that may impact pilot visibility.

Current closed loop flight tracks at Offutt AFB utilize the area south of the base to minimize flying over more populated areas of the City of Bellevue. The majority of the land south of the base is currently agriculture or open space. As the city has grown, plans have been developed for an industrial site south of the base. The completion of the Highway 34 extension south of Offutt AFB may spur future development in the area as well. Bellevue has been looking into developing light industrial uses south of Offutt AFB and are working on developing a master plan for the area. Throughout this process, Bellevue has been in coordination with Offutt AFB and plans to work with the base in the future to ensure compatible uses are built. The City is also looking into the establishment of an overlay zone that would

require future development outside the base to be compatible with the military mission and operations.

Both the City of Bellevue and Sarpy County, who own land south of Offutt AFB, have airport overlays that protect the land from certain types of incompatible uses. However, these overlays only regulate land with safety zones and noise contours.

Existing Tools

Sarpy County Zoning Regulations

Sarpy County has established an Airport Approach Zone District that will be overlaid to any primary zoning district under approach and departure zones for all heliports, airports, or airfields. Height limits within the Airport Approach Zone District are required to meet the latest federal and state regulations regarding height in airport approach areas. Performance Standards in the Airport Approach Zone District prevent the Director of Planning from approving any land uses that will release into the air any substance which would impair visibility, such as steam, dust and smoke – except smoke from existing heating plants, incinerators, and fireplaces.

City of Bellevue Zoning Ordinance

Section 5.29.07 of the City of Bellevue Zoning Ordinance establishes land use restrictions for areas including the CZ, APZ I and II, Noise Zones, and Height and Obstruction criteria for the Overlay Districts. The standards are in place to preserve the operational capabilities and mission of Offutt AFB, and to prohibit uses which create potential hazards to the safe approach and departure of aircraft and uses which release into the air any substance that would impair visibility or otherwise interfere with the operation of aircraft (e.g., steam, dust, and smoke).

Findings

- The City of Bellevue and Sarpy County have airport overlay districts to address compatibility, yet the overlays do not apply outside of the safety zones and noise contours.
- The City of Bellevue has plans for an industrial park south of Offutt AFB, but will work with the base to ensure compatibility.

Please see the next page.

5.8 Energy Development (ED)

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

The moving blades of a wind turbine create a Doppler effect that can interfere with radio transmissions between air traffic controllers and aircraft and other types of communications, such as satellites. Recent studies indicate that large numbers of wind turbines located between five and eight miles from a radar system can have a negative impact on the system and interfere with readings. The impacts on radar are increased with the height, number, and clustering of turbines. The greatest impact is caused by their location proximate to the radar system. Although research is still being conducted, it is not fully known how tall, large, or how many wind turbines must be present to compromise radar operations.

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

Key Terms

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

ISSUE ED-1	**Potential wind farm development in the region could interfere with military devices / operations** Areas proximate to Offutt AFB have been identified by wind farm developers as an area of interest for potential alternative energy projects. The siting of wind farms within 10-30 miles of Offutt AFB could result in impacts to Air Force systems and operations, particularly communication infrastructure and frequency interference.

Compatibility Assessment

Future commercial wind energy presents a possible threat to Offutt AFB, despite its clean energy benefits. The presence of large, commercial wind farms present challenges to flying missions such as radio frequency (RF) interference, clutter, or screening. RF clutter sources, such as wind turbines, have the potential to corrupt the accuracy of radar signals critical to range testing produced by the rotating turbine blades inducing undesired Doppler shift on the radar signal. Wind farms heighten this effect due to the increase in density of wind turbines.

The two main impacts of large wind farms are screening, or blocking out portions of the "field of view" so that aircraft control instrumentation and / or personnel cannot see aircraft that fly behind the "screen"; and causing false readings on the radar that make it appear there are aircraft flying in the area that are not there. All types of wind development have the potential to affect radar operations at Offutt AFB because of frequency interference. This impact depends on the height of the wind turbines, the distance from Offutt AFB and its operational areas, and the density of the turbines. Typically large commercial wind farms are often the cause of interference. Individual or personal turbines rarely cause interference.

To date, the power companies that serve the area surrounding Offutt AFB in Nebraska have not shown interest in wind energy. However, Iowa is a national leader in wind energy installation and manufacturing. MidAmerican Energy, a major energy company, currently provides 2,285 megawatts of wind energy from wind farms in Iowa. The closest wind farm to Offutt AFB is the Walnut Wind Farm about 40 miles northeast of the base. MidAmerican operates the Walnut Wind Farm, located in Pottawattamie County, which has been in operation since February 2009. Figure 5-8.1 shows wind resource potential and the locations of active wind farms within an approximately 100-mile radius of Offutt AFB. As shown on Figure 5-8.1, Walnut Wind Farm is fairly close to one of the departure flight tracks used by Offutt AFB aircraft, which may have the potential to interfere with communications or flight equipment, although no issues were mentioned during the JLUS process.

Walnut Wind Farm in Pottawattamie County, Iowa

In 2014, MidAmerican Energy made an agreement with Google to supply Google's Council Bluffs data center with up to 407 megawatts of wind power. To keep this agreement, the company will be constructing up to 656 new wind turbines in Iowa, adding up to 1,050 megawatts of wind generation, by the end of 2015. However, most of this expansion will be taking place in central/northern Iowa, which are not likely to impact Offutt AFB. Even though there are no projects currently proposed within the immediately area of Offutt AFB, the building and expansion of wind farms is growing in Iowa.

Existing Tools

Pottawattamie County Zoning Ordinance

Section 8.004.230 of the Pottawattamie County Zoning Ordinance outlines regulations for the placement of commercial wind turbine generators. The placement requires a conditional use permit application, which must include documentation that the property owner has provided the right to construct and operate the wind farm. It is also required that the wind farm will not interfere with the radio and television reception on adjoining properties. In the event of any interference, the owner of the wind farm must remedy the interference. Windmills, among other types of structures, are permitted to be taller than the established structure heights in a zone.

Cass County Zoning Regulations: Wind Energy Installation

Section 7.14 of the Cass County Zoning Regulations controls wind energy facilities, which are permitted in any zoning district, with a conditional use permit. The application requirements for a conditional use permit include, but are not limited to, a survey map, identification of any potential effects that may be placed on current or future use of the land and surrounding area, information on the flora and fauna in the area, and standard drawings of the structural components. General siting and design standards include air traffic warning lights, if required by the FAA, and minimization / mitigation of any interference with electromagnetic communication.

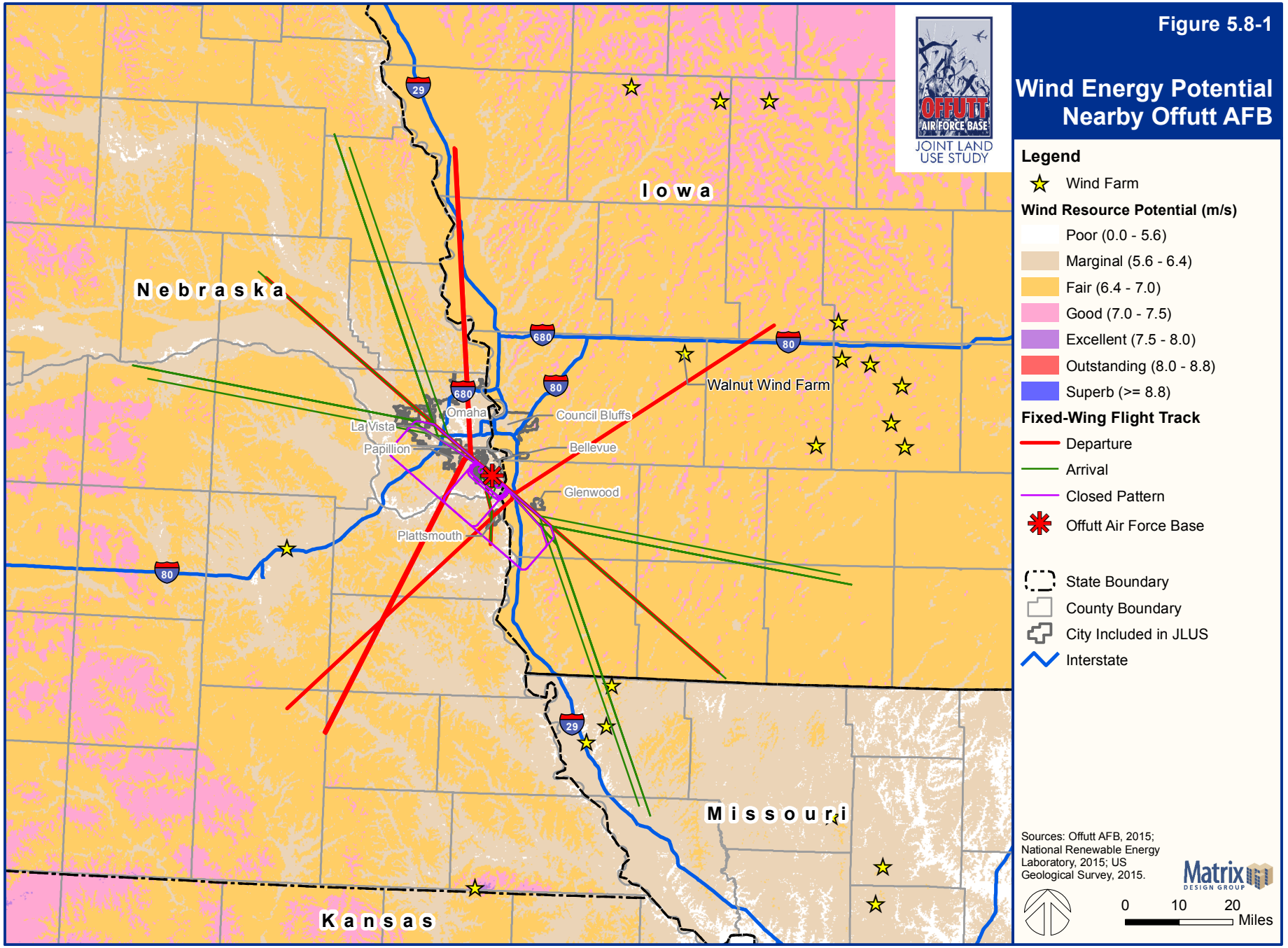


Figure 5.8-1
Wind Energy Potential Nearby Offutt AFB
JOINT LAND USE STUDY
Legend
Wind Farm
Wind Resource Potential (m/s)
Poor (0.0 - 5.6)
Marginal (5.6 - 6.4)
Fair (6.4 - 7.0)
Good (7.0 - 7.5)
Excellent (7.5 - 8.0)
Outstanding (8.0 - 8.8)
Superb (>= 8.8)
Fixed-Wing Flight Track
Departure
Arrival
Closed Pattern
Offutt Air Force Base
State Boundary
County Boundary
City Included in JLUS
Interstate
Sources: Offutt AFB, 2015; National Renewable Energy Laboratory, 2015; US Geological Survey, 2015.
Matrix DESIGN GROUP
0 10 20 Miles
Iowa
Nebraska
Missouri
Kansas
Walnut Wind Farm
Omaha
Council Bluffs
La Vista
Papillion
Bellevue
Glenwood
Plattsmouth
29
680
80

Sarpy County Zoning Regulations: Wind Energy Regulations

Section 41.9 of the Sarpy County Zoning Regulations outlines regulations for the construction and operation of wind energy facilities. A special use permit application is required for all small wind energy systems, which must include, but is not limited to, compliance with FAA and Federal Communications Commission (FCC) regulations, the location of the facility, documentation of agreement with participating landowners, and elevations of the facility. The ordinance limits the height of freestanding energy systems to 80 feet. Section 41.9.9.D of the ordinance restricts the placement of wind energy facilities inside any protected species habitat areas and must be spaced at least 1,500 feet from wetlands, unless the reviewing bodies find the system will not impact the habitat areas.

Douglas County Zoning Regulations: Wind Energy Conservation Systems

Section 5.08.B of the Douglas County Zoning Regulations outlines the regulations for Wind Energy Conservation Systems. The operation of the system shall not interfere with radio, television, computer, or other electronic operations on adjacent properties. The height of the system may exceed the height restrictions of the base district by up to 50 percent. The construction of a system does require a special use permit; unless located in areas zoned Limited Industrial or General Industrial, where it is a permitted use.

City of Bellevue Zoning Ordinance: Commercial/Utility Grade Wind Energy Systems

Section 8.10 of the City of Bellevue Zoning Ordinance regulates the use of commercial / utility grade wind energy systems (CWECS). The placement of a system requires a conditional use permit, which must include, but is not limited to, the following:

- Site layout, including the location of property lines, wind turbines, electrical grid, and all related accessory structures.
- The latitude and longitude of individual wind turbines.
- Documentation of land ownership or legal control of the property.
- Location of wetlands, scenic, and natural areas (including bluffs) within 1,320 feet of the proposed CWECS.
- FAA and FCC permit, if necessary.
- Location of all known communication towers within two miles of the proposed CWECS and evidence that there will be no interference with any such commercial and/or public safety communications towers.
- A CWECS shall be located on a parcel that is at least ten (10) acres in size.

In addition, the conditional use permit process requires a review by Offutt AFB. The ordinance also includes regulations for aggregated projects, setbacks, safety and design standards, noise and shadow flickers, use of public roads, decommission planning, repair, abandonment, removal, and liability insurance.

City of La Vista Zoning Ordinance: Wind Energy Systems

Section 7.18 of the City of La Vista regulates wind energy conversion systems, which are allowed in any district with a conditional use permit. The application for the permit must include documentation that access to wind is sufficient for operation. The system is required to not cause interference to the radio and television reception on adjoining properties.

City of Omaha Code of Ordinances

Sec. 55-767.d of the City of Omaha Code of Ordinances regulates wind energy conservation systems (WECS). The systems are permitted in areas zoned Agriculture and require a conditional use permit in areas zoned Development Reserve, General Industrial, and Heavy Industrial. A special use permit is required in all other districts. WECS are required to not interfere with the radio or television reception on adjoining properties. The application for a conditional use permit or a special use permit must include:

- A plan indicating the size and location on the site of the WECS.
- Data pertaining to the machine's safety and stability.
- Documentation, covenants or easements from adjacent or surrounding property owners providing wind access sufficient for satisfactory operation if such access is necessary.
- Certification of approval of the method of interconnection and operation by the Omaha Public Power District.

Findings

- The City of Council Bluffs does not permit wind energy conversion systems within the corporate boundaries of the city.
- Mills County and the cities of Papillion and Glenwood do not have regulations for wind energy conversion systems.
- Most cities and counties require wind energy conversion systems to not interfere with television or radio reception; however the requirement is often limited to adjoining properties and does not apply to inference that affects aircraft.
- Most zoning regulations apply to commercial systems and do not apply to personal / small systems.
- Commercial WECS can adversely impact Offutt AFB communication and flying operations due to strength, height, and location of the systems.

ISSUE ED-2	**Potential solar development in the region could impact pilot visibility** Certain types of solar energy systems could interfere with pilot visibility if they are located in areas that cause glare or reflection into flight paths.

Compatibility Assessment

Certain alternative energy technologies such as solar panels incorporate reflective materials in their construction that assist in the generation of energy for distribution and power, but also produce unintended glare. The location and direction of glare can impair the vision of military and civilian pilots who may be training or performing activities in the vicinity of the airport or within designated flight routes. Visual impairment can decrease pilot and aircraft safety and ultimately that of the general public should an accident occur. It is for this unintended reason that many jurisdictions near Offutt AFB restrict the use of solar arrays.

Though solar energy technology and use has been evolving over the past several decades as a mainstream form of renewable energy generation, the recent expansion in the industry and corresponding decrease in cost has only recently made it a practical consideration for airports. Solar energy presents itself as an opportunity for airports to produce on-site electricity and to reduce long-term electricity use and energy costs. While solar energy has many benefits, it does introduce some new and unforeseen issues, like possible glare (also referred to as reflectivity) and communication systems interference, which have complicated FAA review and approval of the technology.

The solar panels in the form of a photovoltaic system (PV) is a technology that can readily be designed into an existing landscape can be placed in locations that are not used for aviation activities and therefore have little value to the airport or for alternative developments. Relative to other

renewable energy systems, various industry studies have determined that solar PV is more compatible with airport land use for the following reasons:

- Is most cost-effective when serving a smaller on-site electricity demand as opposed to large-scale generation for the electricity grid;
- Has a low profile and modular design, which is compatible with low-demand airport property such as rooftops and airfields;
- Is designed to absorb sunlight (rather than reflect it), minimizing potential impacts of glare; and
- It does not attract wildlife, which is a critical aviation hazard.

The siting of solar arrays is particularly well-suited to airports because of the available space at airports, unobstructed terrain, and energy demand. Airport managers have recognized the business advantages of solar power as an alternative revenue source and in providing long-term cost savings. In addition, public policy benefits to municipal, county, and state government agencies that manage airports and have set greenhouse gas reduction goals offer a real and purposeful basis for these projects.

Despite these benefits, the potential glare from solar facilities and any other facilities with reflective surfaces do pose a concern to military pilots. The military has expressed concerns regarding the possible effects of solar facilities on its training mission; however, the FAA has developed guidelines for siting such solar arrays. The FAA, with support from the US Department of Energy (DOE), has developed a protocol to analyze the potential impacts of glare. When a project is proposed on airport property, the FAA has broad authority. The airport, as recipient of FAA funds for infrastructure improvements, is responsible for presenting information so that the FAA can assess a project's compliance with airspace protection laws (referred to as Part 77) and environmental laws (such as the National Environmental Policy Act).

Concerns about glare are specific to on-airport activities; however certain factors such as optimal proximity (the distance away from airfield facilities and flight paths) require evaluation on a case by case basis in consultation with the airport manager who may defer to FAA guidance. While the restrictions placed on solar arrays are understandable, this can be avoided by using the right technologies in an efficient manner.

Existing Tools

Technical Guidance for Evaluating Selected Solar Technologies on Airports

The FAA Office of Airports / Airport Planning and Environmental Division established technical guidance for use by local airports managers to assist in providing a readily usable reference for FAA technical staff who review proposed airport solar projects and for airport sponsors that may be considering a solar installation. It addresses a wide range of topics including solar technology, electric grid infrastructure, FAA safety regulations, financing alternatives, and incentives.

As a result of its broad authority to protect airspace, the FAA must be given data to review any construction or alteration on a public use airport regardless of height or location. This guidance manual identifies the steps that solar development proponents must take to avoid impacts on aviation and the environment. Airport sponsors are required to assess airspace penetration, reflectivity, and communication systems interference for all airport solar projects. The FAA is also authorized to review all projects for compliance with national environmental laws.

This set of guidelines provides a checklist of FAA procedures to ensure that proposed photovoltaic or solar thermal hot water systems are safe and pose no risk to pilots, air traffic controllers, or airport operations. Although the guidelines are still applicable, it should be noted that as of October 2013, the FAA is reviewing multiple sections of the guidance as a result of new information and field experience, particularly with respect to compatibility and glare.

Solar Glare Hazard Analysis Tool (2013)

In February 2013, The FAA made available a beta version of the Solar Glare Hazard Analysis Tool (SGHAT), developed by the DOE's Sandia National Laboratories, for assessing potential glare impacts from individual projects. The SGHAT determines when and where solar glare can occur throughout the year from a PV array as viewed from specified observation points by use of an interactive map for specifying solar project sites and observer locations. Latitude, longitude, and elevation are automatically recorded through the map interface, providing necessary information for sun position and vector calculations.

If glare is identified as a potential result, the tool is able to predict potential hazards and produces a color-coded display of the potential for the glare to result in an ocular impact. Upon completion of the initial results, the model can also be used as a planning tool to alter the project's design characteristics (including footprint, orientation, and tilt angle) and evaluate the potential reflections produced and the opportunities to minimize or eliminate the effects of glare on sensitive receptors.

The FAA has established informal guidelines for how SGHAT should be used so that the agency can determine how glare affects controllers who are working in air traffic control towers and pilots who are arriving at the airport on final approach. Once the area of the solar project is located and its design characteristics recorded, information on each of the glare-sensitive receptors must be input. Improvement and wider disbursement of this tool for use by additional users is currently in progress.

City of Bellevue Zoning Ordinance

Solar panel development is not permitted within the City of Bellevue unless a permit is approved. The City of Bellevue Zoning Ordinance permits solar panels as a building attachment, and freestanding structures up to 15 feet in height and no more than one foot from any existing easement. All panels must comply with the city's building standards. Additionally, the AICUZ Overlay District states that any land uses that may produce reflective light emissions and/or impact a pilot's vision are prohibited.

City of La Vista Zoning Ordinance

The City of La Vista's Zoning Ordinance does not permit the development of solar panels within residential zoning districts unless a permit is approved. The City of La Vista permits building attachment and freestanding solar panels up to 15 feet in height, and no more than one foot from any existing easement. All solar panel structures are required to conform with the City of Bellevue building standards.

Findings

- The proposed development of alternative energy within the City of Bellevue must be reviewed by the city's enforcement officer and Offutt AFB. Offutt AFB must determine that the solar panel development will not cause interference with military activities.
- The City of La Vista does not require proposed development to be reviewed by Offutt AFB.

Please see the next page.

5.9 Frequency Spectrum Capacity (FSC)

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

Key Terms

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

ISSUE FSC-1	**Data bandwidth usage**
	The 55th Wing, STRATCOM, and the 557th Weather Wing are all heavily dependent on data bandwidth.

Compatibility Assessment

Communication is a priority for US Strategic Command (STRATCOM), which is headquartered at Offutt AFB. The STRATCOM mission includes surveillance, information operations, and global command and control. Offutt AFB utilizes defense satellite communication systems and Military Strategic and Tactical Relay.

Frequency for radio spectrum has intensified in recent years, particularly in bands that are optimal for mobile systems (approximately 200MHz–4GHz). This factor has had an impact on the perceived (and actual) value of spectrum. Spectrum re-allocation heavily favors the private sector. It is this re-allocation of the bandwidth to the commercial industry that threatens the DOD-allocated capacity to conduct secure communications missions.

Civilian and commercial use of available RF can be an additional concern to operations at Offutt AFB due to the 55th Wing, STRATCOM, and the 557th Weather Wing all heavily rely on data bandwidth. Increased uses of mobile devices can threaten the availability of bandwidth that Offutt AFB would need to conduct mission activities. This increased demand and limited availability of the spectrum can reduce mission readiness for the STRATCOM and other mission critical operations.

In addition new development in the area and large employment centers can create additional demand, which will increase the use of bandwidth by various commercial entities. It is not likely that this increase in devices will have a major impact on operations at Offutt AFB, but it should be an awareness issue monitored in the future.

As the demand for wireless application grows, the complexity of the management and regulation of radio frequency (RF) develops. This management and regulation complexity can concern the military in executing their missions and operations.

Existing Tools

Federal Communications Commission

The FCC is the agency responsible for regulating non-governmental interstate and international (which originate or terminate within the US) radio, television, wire, satellite, and cable communications within all 50 states, Washington D.C. and all US territories. It is the entity that licenses non-Federal use of the frequency spectrum through a public process.

National Telecommunications and Information Administration, Office of Spectrum Management

The Office of Spectrum Management (OSM) is a branch of the National Telecommunications and Information Administration (NTIA) that is responsible for managing how the Federal government uses the RF spectrum. Some of the tasks of the OSM are to assist in managing the use of the RF spectrum and include assigning frequencies to government agencies, maintaining spectrum use databases, planning peacetime and wartime use of the spectrum, and participating in Federal government communications regarding emergency readiness. Approximately 70 Federal agencies and departments use the RF spectrum for communications, broadcasting, navigation and other purposes that are crucial to their continued operations. The NTIA maintains a Government Master File of the more than 40 specific radio services and frequency assignments that these agencies and departments use.

The FCC and NTIA executed a Memorandum of Understanding (MOU) on spectrum coordination in January 2003. The MOU established procedures relating to frequency coordination, spectrum planning provisions, and a framework for compliance with the statutory requirements. The Communications Act assigned joint jurisdiction for spectrum management to the FCC and the NTIA. The FCC is responsible for non-federal users and NTIA is responsible for federal users. Because the majority of spectrum is shared between federal and non-federal users, the FCC and NTIA must coordinate spectrum policy.

FCC Communication Security, Reliability, and Interoperability Council

The FCC maintains an active working group to address communications system reliability through its Communication Security, Reliability, and Interoperability Council (CSRIC). The CSRIC's mission is to provide recommendations to the FCC that attempt to "ensure…optimal security and reliability of communications systems, including telecommunications, media, and public safety." Although this program is not specific to Offutt AFB or maintain a specific program with the installation, it should be considered an important tool in the management of communications used for emergency response situations.

Federal Aviation Administration Spectrum Engineering Services Office

The Spectrum Engineering Services Office secures, manages, and protects all civil aviation RF spectrum resources. Among other things, this Office is responsible for coordinating and negotiating with other government agencies, industries, and international partners to obtain appropriate spectrum resources for aviation usage and maintaining aviation spectrum resources free from interference from other services.

Spectrum management is conducted by assigning and engineering radio frequencies for the AFB systems, maintaining the aviation spectrum use database, analyzing new FAA systems requirements and certifying that spectrum resources will be providing the necessary technical engineering expertise. This process performs specific spectrum resources available assessments and tests new systems and electronics for compatibility with DOD equipment.

Federal Strategic Spectrum Plan (2008)

The 2008 Federal Strategic Spectrum Plan is a presidential initiative for US spectrum policy in the 21st Century. The Plan's goals are to foster economic growth, ensure national and homeland security, maintain US global leadership in communications technology and services, and satisfy other vital US needs in areas such as public safety, scientific research, Federal transportation infrastructure, and law enforcement. The NTIA initiated strategies within the Plan to address the diverse needs of the spectrum. The document specifically calls out supporting Federal missions while "fostering the commercial systems that underpin the nation's economic growth and technological information."

The Plan sites the increasing spectrum needs of both the Federal Government and commercial users. The plan is oriented towards near and mid-term goals because of the uncertainty of the future needs of the spectrum. The most relevant goals to this issue include:

- Use of Commercial Services Where Feasible: Federal regulations require Federal agencies to use commercial communications and spectrum-dependent services where possible. Improvements in technology have made using commercial communications more reliable but certain emergency related Federal uses may be too complex for commercial networks. Federal agencies cannot control commercial capacity directly so a plan to balance commercial and federal use of satellites when needed is proposed.
- Flexible Approach to Incentives: Currently, regulatory hurdles prevent Federal and non-Federal spectrum uses from efficiently sharing spectrum. Sharing the spectrum could allow Federal agencies to make underutilized spectrum available to non-Federal entities. This would lead to a more efficient use of the spectrum for all parties involved.
- Spectrum Valuation and Economic Efficiency: The Office of Management and Budget has instructed the Federal agencies to consider the economic value of radio spectrum when developing justifications for new systems. The NTIA has also discussed identifying and establishing incentives to promote more efficient and effective use of the spectrum.
- Technical Efficiency: NTIA engineers are developing more precise methods to improve management of the spectrum. By increasing efficiency and effectiveness of the spectrum, there should be an increase in the amount of time frequency assignments are in use.
- Forecasting Trends: Development of new spectrum management tools will improve quantification of Federal spectrum use and refine estimates of future requirements.

Though long-term use of the spectrum is unclear, steps are being taken by the Federal government to ensure that use of the spectrum is available to all parties while maintaining national security and economic well-being.

Findings

- Management and regulation of RF is a complex issue.
- There is an ever-growing demand for bandwidth for other uses such as mobile electronic devices.
- This spectrum bandwidth issue is managed at the federal level.

Please see the next page.

5.10 Frequency Spectrum Impedance / Interference (FSI)

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

Key Terms

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

Impedance. Impedance is the interruption of electronic signals due to the existence of a structure or object between the source of the signal and its destination (receptor). Certain structures have the potential to block, or impede, the transmission of signals from antennas, satellite dishes, or other transmission / reception devices affected by line-of-sight requirements.

Interference. Interference is the inability to effectively distribute or receive a particular frequency because of similar frequency competition. As the use of the frequency spectrum increases (such as the rapid increase in cellular phone technology over the last decade) and as development expands near military installations and operational areas, the potential for frequency spectrum interference increases.

Technical Background

The Department of Defense's (DOD) use of frequency spectrum allows for safe operations and the effective delivery of weapons on target without interference. The DOD's frequency spectrum needs for testing, evaluation, and training is constantly increasing, while the spectrum available for DOD use is decreasing. The National Telecommunications Industry Association (NTIA) Office of Spectrum Management (OSM) explains that:

> *…almost every agency of the Federal Government uses the spectrum in performing mandated missions. The DOD uses the spectrum extensively for tactical uses and non-tactical uses. In the United States tactical uses are generally limited to a number of specific testing sites and training facilities, but DOD's non-tactical applications are extensive and include aircraft command and control, mobile communication in and around military bases, and air fields and long distance communications using satellites.*

Frequency interference is related to other transmission sources. Interference can result from a number of factors, including:

- Using a new transmission frequency that is near an existing frequency;
- Reducing the distance between two antennas transmitting on a similar frequency;
- Increasing the power of a similar transmission signal;
- Using poorly adjusted transmission devices that transmit outside their assigned frequency or produce an electromagnetic signal that interferes with a signal transmission; and
- Existing electronic sources and uses created by portable systems affecting entire communities utilizing Wi-Fi broadband systems and industrial sources that produce electronic noise by-product.

The military relies on a range of frequencies for communications and support systems. Since 1993, Congress has been selling federal spectrum bands for reallocation to the private sector, promoting the development of new telecommunications technologies, products and services. The expanding public and commercial use of the frequency spectrum from wireless transmitters to consumer electronics can encroach on the military's use of the frequency spectrum. Increasing community and DOD demands for this important resource can create conflicts for all users.

ISSUE FSI-1	**Local radio stations may cause interference with Offutt AFB operations** There is a potential for radio frequency interference, including the local KIMI radio station, to interfere with operations at Offutt AFB or aircraft instrumentation if they are on a similar frequency to one used by the base.

Compatibility Assessment

In the past, Offutt AFB had conflicts with a local radio station that was interfering with the frequencies of operational equipment used by the base. The frequency 107.7 FM was initially planned for use by a local radio station in Malvern, Iowa. After assessment by the FAA that the radio tower could interfere with Instrument Landing System (ILS) frequencies at Offutt AFB and Eppley Airfield in Omaha, the application permit was deleted in 2010. In June 2012 radio station KIMI 107.7 FM applied to relocate from Malvern, Iowa to Sidney, Iowa, a new site further away from Offutt AFB and Eppley Airfield. The effective radiated power increased from 6,000 watts to 50,000 watts and increased its antenna height above average terrain to 124 meters. The application was approved and the station began broadcasting in February 2013. Because the station changed its frequency and boosted its power, there was an increase in interference with pilots' ILS. When the KIMI station combines with other radio signals in the area, it has the potential to create a "ghost" frequency that interferes with the ILS. The station is now operating at a lower power and has agreed to pay to change the ILS frequency.

Existing Tools

National Telecommunications Industry Association Office of Spectrum Management

The OSM is a branch of the NTIA that is responsible for managing how the Federal government uses the RF spectrum. Some of the tasks of the OSM are to assist in managing the use of the RF spectrum and include assigning frequencies to government agencies, maintaining spectrum use databases, planning peacetime and wartime use of the spectrum, and participating in Federal government communications regarding emergency readiness. Approximately 70 Federal agencies and departments use the RF spectrum for communications, broadcasting, navigation and other purposes that are crucial to their continued operations. The NTIA maintains a Government Master File of the more than 40 specific radio services and frequency assignments that these agencies and departments use.

Federal Communications Commission Communication Security, Reliability, and Interoperability Council

The FCC maintains an active working group to address communications system reliability through its CSRIC. The CSRIC's mission is to provide recommendations to the FCC that attempt to "ensure…optimal security and reliability of communications systems, including telecommunications, media, and public safety".

Findings

- The KIMI radio station has changed its operating power and will pay to change the ILS frequency to prevent future interference.

ISSUE FSI-2	**Growing communities and increased usage of electronic devices could interfere with military frequencies** As communities grow around Offutt AFB and its off-site remote transmitter sites, Elkhorn and Scribner, there is likely to be an increase in wireless devices and other types of devices that may pose frequency interference concerns for Offutt AFB operations.

Compatibility Assessment

Radio Frequency is a valuable resource requiring its use to be regulated by the government; however, not all equipment that uses RF energy is required to have a license or assignment. Part 15 is the portion of the FCC rules that regulates unlicensed RF devices, referred to as "Part 15 devices". Because of their limited, ultra-low power outputs, they are conditionally permitted to operate in almost all RF bands, including those dominated and heavily utilized by DOD.

Part 15 devices include common commercial items such as Baby monitors, cordless telephones, laptop computers, wireless computer mice, remote keys, wireless headsets, garage door openers, low-powered walkie-talkies, and wireless modems. Part 15 devices use the same RF resources as the licensed users of the electromagnetic spectrum, including the DOD, fire stations, hospitals, and police forces. As such, civilian use of Part 15 devices can interfere with military equipment and military equipment can interfere with Part 15 devices owned by private individuals.

About a decade ago, some areas around Offutt AFB experienced conflicts with Air Force frequency usage that caused interference with communication devices used in homes, such as garage door openers. This issue was brought to the attention of Offutt AFB at that time. Upon investigation, the issue was found to be associated with a specific B-2 aircraft system, and the Air Force was able to make a change that eliminated the interference issue. This is an example of good base stewardship to address a concern with the community that resulted in the base taking action to fix the problem.

The 55th Strategic Communications Squadron operates the High Frequency Global Communications System (HFGCS). The mission of this system is to provide continuous, reliable and rapid two-way communications to all DOD ground agencies, naval vessels, and flying assets. The HFGCS includes two facilities outside of the main base at Offutt AFB. The headquarters and transmitter site is a 10,000 square foot facility in Elkhorn, Nebraska, about 35 miles northwest of Offutt AFB. This site covers 386 acres. Further north of this, in Scribner, Nebraska, is the smaller receiver site, covering 156 acres. Between the two sites, there are more than 30 communications antennas, including directional rotatable log periodic antennas, omnidirectional antennas, and at least 15 high-frequency antennas that are approximately 100 feet tall. The sites have a communications coverage area of 6,000 miles.

Elkhorn Communications Site with one of its antennas

Existing Tools

Federal Strategic Spectrum Plan 2008

The 2008 Federal Strategic Spectrum Plan is a presidential initiative for US spectrum policy in the 21st Century. The Plan's goals are to foster economic growth, ensure national and homeland security, maintain US global leadership in communications technology and services, and satisfy other vital US needs in areas such as public safety, scientific research, Federal transportation infrastructure, and law enforcement. The NTIA is responsible for developing a strategy within the plan to address the diverse needs of the spectrum. The document specifically calls out supporting Federal missions while "fostering the commercial systems that underpin the nation's economic growth and technological information."

Continued and growing demand for High Frequency spectrum stands out in agency forecasts for defense, homeland security, public safety and continuity of government operations, both fixed and mobile. The High Frequency Coordination Conference estimates that 850 kHz of additional spectrum between 4 and 10 MHz is required to eliminate the co-channel interference that currently exists.

Part 15 Rules

The rules and technical specifications that apply to non-federal use of unlicensed devices are in Title 47 of the Code of Federal Regulations Part 15 (47 CFR 15). There are many parts to Title 47, each regulating a different type of radio operation. For example, Part 11 regulates the Emergency Alert System, Part 59 discusses infrastructure sharing, and Part 97 covers the Amateur Radio Service. Part 15 regulates RF devices and contains language specifically regulating the operation of unlicensed devices.

Findings

- Though long-term use of the spectrum is unclear, steps are being taken by the Federal government to ensure that use of the spectrum is available to all parties while maintaining national security and economic growth.
- In addition, the overarching frequency spectrum impedance / interference issue with the DOD operations is managed at the federal level at this point.

5.11 Housing Availability (HA)

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

Key Terms

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

Privatized Housing. Offutt AFB entered into an agreement with Offutt AFB America First Communities, LLC, (OAFCO) a Nebraska Limited Liability Company, to manage and maintain military housing at the base. Since Offutt AFB no longer operates military family housing, the housing available to military personnel either on-base, or outside the main base in the Rising View community (on land owned by Offutt AFB) is known as privatized housing.

ISSUE HA-1	**Housing options for Offutt AFB personnel**
	Local jurisdictions' growth policies do not specifically address military workforce housing needs and the military has not provided adequate information on housing demand by location.

Compatibility Assessment

The workforce at Offutt AFB is composed of both military and civilian personnel. Civilian personnel typically live within the communities around Offutt AFB, but may commute from further communities, including those not included in the JLUS Study Area. Military personnel have the option to live in the local communities, or in privatized housing. There are 1,640 privatized housing units available for military personnel and their families at Offutt AFB and in the Rising View neighborhood. As of August 31, 2014, 1,582 of these units were occupied. With more than 5,000 Active Duty personnel stationed at Offutt AFB, this means there is a large number of personnel who live outside of the base-provided housing.

Offutt AFB military family housing

Military personnel, depending on their rank and number of years of service, receive a basic allowance for housing to apply towards housing for themselves and their dependents. All of the jurisdictions within the Study Area have experienced an increase in both median gross rent and median housing values, while there was only a small increase in the number of housing units.

Table 5.11-1 shows the change in median monthly rents for communities in the JLUS Study Area from 2000 to 2010. During this timeframe, the median monthly rent increased by a range of roughly 26 to 46 percent among the Study Area jurisdictions.

Table 5.11-1 Median Monthly Rents, 2000-2010

Jurisdiction	2000	2010	Number Change	Percent Change
Nebraska	**$491**	**$648**	**$157**	**32.0%**
Cass County	$502	$662	$160	31.9%
City of Plattsmouth	$499	$631	$132	26.5%
Douglas County	$541	$725	$184	34.0%
City of Omaha	$537	$712	$175	32.6%
Sarpy County	$607	$813	$206	33.9%
City of Bellevue	$581	$757	$176	30.3%
City of La Vista	$646	$830	$184	28.5%
City of Papillion	$622	$832	$210	33.8%
Iowa	**$470**	**$617**	**$147**	**31.3%**
Mills County	$465	$677	$212	45.6%
City of Glenwood	$462	$632	$170	36.8%
Pottawattamie County	$537	$689	$152	28.3%
City of Council Bluffs	$550	$694	$144	26.2%

Source: US Census Bureau, Median Gross Rent (Dollars) 2000, 2010

Table 5.11-2 Median Housing Value, 2000-2010

Jurisdiction	2000	2010	Number Change	Percent Change
Nebraska	**$86,900**	**$123,900**	**$37,000**	**42.58%**
Cass County	$96,000	$142,800	$46,800	48.75%
City of Plattsmouth	$81,000	$101,600	$20,600	25.43%
Douglas County	$99,600	$141,400	$41,800	41.96%
City of Omaha	$93,300	$131,900	$38,600	41.79%
Sarpy County	$112,000	$158,600	$46,600	41.60%
City of Bellevue	$96,900	$137,800	$40,900	42.21%
City of La Vista	$92,900	$143,700	$50,800	54.68%
City of Papillion	$126,600	$163,800	$37,200	29.38%
Iowa	**$82,100**	**$119,200**	**$37,100**	**45.18%**
Mills County	$95,200	$144,200	$49,000	51.47%
City of Glenwood	$92,800	$131,100	$38,300	41.27%
Pottawattamie County	$84,800	$126,100	$41,300	48.70%
City of Council Bluffs	$76,500	$110,500	$34,000	44.44%

Source: US Census Bureau, Median Gross Housing Value (Dollars) 2000, 2010

Table 5.11-2 provides the median housing value trends in the Study Area from 2000 to 2010. Median housing values have experienced substantial growth throughout the JLUS Study Area. From 2000 to 2010, the median housing value increased by an average of 42.6 percent within the Study Area jurisdictions

These increasing values translate into higher rents and mortgages as well as an increase in the cost of living for area residents. Greater housing values cause a challenge to the affordability of housing near Offutt AFB, especially due to the high cost of housing seen in the cities of Bellevue, La Vista, and Papillion, and Sarpy County, the area closest to the base.

The 2015 BAH rates are shown in Table 5.11-3. The locations with the highest median rent in the Study Area are the cities of La Vista and Papillion and Sarpy County. The City of Papillion's median rent in 2010 was $832, which is just under the lowest BAH rate, $855. Offutt AFB tracks where its personnel live by zip code, but does not provide this information to local communities to help them plan for preferences in military living. The high concentration of military personnel can place a high demand on housing, limiting availability. For example, more than 2,500 of Offutt AFB personnel live in the 68123 zip code, west of the base in Sarpy County. Even though the lowest BAH rate covers the highest median rent, availability can eliminate options the rate covers. This lack of availability of housing can result in military personnel pursuing home ownership and apartment rental located further from Offutt AFB in other cities.

Table 5.11-3 BAH Rates, 2015

Rank	BAH without Dependent	BAH with Dependent
E-1	$855	$1110
E-2	$855	$1110
E-3	$855	$1110
E-4	$855	$1110
E-5	$951	$1224
E-6	$1047	$1395
E-7	$1116	$1440
E-8	$1260	$1491
E-9	$1311	$1599
W-1	$1068	$1398
W-2	$1257	$1461
W-3	$1317	$1521
W-4	$1407	$1629
W-5	$1452	$1752
O-1E	$1224	$1452
O-2E	$1299	$1512
O-3E	$1395	$1647
O-1	$996	$1242
O-2	$1185	$1392
O-3	$1335	$1518
O-4	$1446	$1803
O-5	$1503	$2004
O-6	$1521	$2025
O-7	$1551	$2043

Source: http://offutthousing.com/bah.php

Offutt AFB does not currently provide surrounding jurisdictions with the number of military personnel living in their community. Because the base does not provide these numbers, jurisdictions are unable to improve housing opportunities for military personnel.

Existing Tools

City of Bellevue Comprehensive Plan

Short term recommendations in the City of Bellevue Comprehensive Plan include conducting an affordable housing study, with emphasis on renter occupied housing, encouraging an even distribution of multi-family housing throughout the city, and encouraging greater housing diversity and styles within neighborhoods. A mid-term recommendation in the plan includes the development of entry level housing that is 70 percent to 80 percent of the current market rate. Community goals for housing in the plan include contributing to the metropolitan area's job-housing balance and creating more choices for all types of housing to better serve the increasingly diverse residents of the City of Bellevue.

City of La Vista Comprehensive Plan

The City of La Vista Comprehensive Plan includes a housing initiative to address the future need for housing. It is estimated that the City of La Vista will need to designate up to 400 acres of land, both within and adjacent to the city through annexation, for residential development. The initiative addresses:

- The development of a marketing plan to promote well-planned residential developments.
- Identification and scheduling of housing projects, both new and rehabilitation, most appropriate for La Vista. Emphasis should be placed on continued support for elderly retirement rental and entry-level single family development.
- Identification of land areas for both renter and owner housing. Areas should include land both inside and adjacent to the city.
- Review and modify local ordinances, as well as the overall political decision-making process as it pertains to residential development. This effort should attempt to eradicate any and all impediments to residential development or rehabilitation.

City of Omaha Master Plan

The City of Omaha Master Plan includes visions and goals to create and preserve healthy neighborhoods. Aspects of the plan include incentives for development, neighborhood monitoring, expansion of affordable housing opportunities, and rehabilitation of housing. Goals of the plan involve:

- Be proactive rather than reactive regarding development
- Conserve existing stable neighborhoods
- Ensure good quality housing
- Promote the construction of affordable housing
- Ensure a mix of housing patterns, types and styles

City of Papillion Comprehensive Plan

The City of Papillion Comprehensive Plan includes neighborhood planning to ensure that every neighborhood provides a positive living environment for its citizens. Basic goals begin with the assumption that Papillion's neighborhoods have special, unique qualities that demand individualized actions to:

- Assure that each neighborhood in Papillion remains healthy.
- Build an environment which allows people from all parts of the city to participate in its growth and development.
- Assure that each neighborhood provides a good residential environment for its residents.
- Create community connections that will unite neighborhoods of the city.

City of Plattsmouth Comprehensive Plan

The City of Plattsmouth Comprehensive Plan includes basic goals that neighborhood-based policies for Plattsmouth should address. Plattsmouth should strive to:

- Ensure that each neighborhood in Plattsmouth achieves a state of wholeness and health.
- Build an environment which allows people from all parts of the city to participate in its growth and development.
- Ensure that each neighborhood provides a good residential environment.

Sarpy County Comprehensive Plan

The Sarpy County Comprehensive Plan has a vision statement and future housing goals. Sarpy County's land use policies attempt to provide for diverse housing types and development densities while directing the location of growth in an efficient and compatible manner. Goals for Sarpy County that address the county's vision include:

- Encourage residential development practices that utilize existing county or private infrastructure.
- Minimize future residential conflicts with designated prime agricultural lands.
- Promote quality residential environments but discourage new residential projects that could generate negative impacts on adjacent tracts and encourage well-planned, mixed commercial/residential projects.

Mills County Comprehensive Plan

The Mills County Comprehensive Plan acknowledges that the attractions of scenic land and a rural lifestyle has generated substantial housing demand and that the county is likely to experience continued development during the next 20 years. Housing availability is included as one of the county's economic development opportunities. One of the quality of life goals and vision includes encouraging housing and development along the completed Highway 34 connection.

City of Council Bluffs Comprehensive Plan

The City of Council Bluffs Comprehensive Plan includes the goal of maintaining the current population and attracting new residents by providing access to a variety of safe, decent, and affordable housing types. Some of the policies to achieve that goal include promoting and encouraging the development of housing with a variety of styles, values, densities, qualities, and locations of housing. Another goal encourages promoting additional housing to attract current commuter populations.

Pottawattamie County Comprehensive Plan

The Pottawattamie County Comprehensive Plan includes a general county goal of maintaining and strengthening relationships between the County and each community, to produce planning practices supportive of proper land usage, economic and housing growth, public facilities and services, transportation and recreation. The plan does not contain any goals specifically for housing, but it does include general population trends and projections.

Douglas County Comprehensive Plan

The Douglas County Comprehensive Plan states that developments in the county, in common with other metropolitan jurisdictions, should incorporate a variety of housing types that provide a range of housing choices to people with different incomes.

Cass County Comprehensive Plan

The Cass County Comprehensive Plan states that housing in the county has seen some positive growth. One of the goals in the plan is to improve Cass County's quality of life, which includes the objective of acting as a catalyst for developing quality affordable housing. Some of the economic

development projects identified are more affordable housing and a comprehensive housing effort to look at types of housing needed.

Findings

- Changes in affordability of housing options in areas outside of Bellevue have prompted personnel at Offutt to pursue housing further from Offutt AFB increasing commuting distances.
- Most comprehensive plans include goals and visions to improve housing and affordability. However, none of the plans specifically address the need for military housing as Offutt AFB has not shared housing information with the communities to assist communities in planning for military housing.

5.12 Infrastructure Extensions (IE)

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

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

Infrastructure plays an important role in land use compatibility. Infrastructure can enhance the operations of an installation and community by providing needed services, such as sanitary sewer treatment and transportation systems. Conversely, infrastructure can create encroachment issues if expanded without consideration of the consequences of future development. The extension or expansion of community infrastructure to a military installation or areas proximate to an installation has the potential to induce growth, potentially resulting in incompatible uses and conflicts between a military mission and communities. Within comprehensive planning, infrastructure extensions can serve as a mechanism to guide development into appropriate areas, protect sensitive land uses, and improve opportunities for compatibility between community land uses and military missions.

Key Terms

Infrastructure. In a broad sense, the word infrastructure in this section refers to public facilities and services such as sewers, water, electric, and roadways that are required to support development (existing and proposed).

ISSUE IE-1	**Infrastructure improvements / extensions may induce growth close to Offutt AFB**
	The new US Highway 34 extension may provide mutual benefits for connecting surrounding counties but also has the potential to induce heavy traffic due to an increase in capacity. The completion of Highway 34 corridor may spur new development south of Offutt AFB, most likely industrial, which may be incompatible with the base's operations or pose safety concerns for the aircraft. The extension of additional / new services to the base could create the potential for growth inducement in areas subject to impacts from Offutt AFB activities and operations.

Compatibility Assessment

Construction of Highway 34 was completed in October 2014, connecting Highway 75 in Nebraska and Interstate 29 in Iowa. The highway extension runs through Nebraska south of Offutt AFB and then enters Mills County in Iowa when it crosses over the Missouri River and state border. The corridor is mostly undeveloped and consists of an estimated 3,000 acres of buildable land on each side of the Missouri River.

Land use along the corridor has been zoned mostly commercial or industrial, but due to the poor transportation connection development was limited in the past. Now that Highway 34 has provided a transportation link, the area is expected to see new development and job growth opportunities. The area is also projected to increase property values from development and improve salaries and wages from job creation within the region. Currently, there is a master plan for an industrial park to be constructed in the area south of Offutt AFB.

As this projected development occurs, it is important that it does not interfere with Offutt AFB operations and that operations do not interfere with future development. Increased development in the area has the potential to bring heavy traffic, increased ambient light, and a rise in the cost of housing. Base operations may generate noise and safety impacts for those living and working nearby. Additionally, an increase in property values in the area makes vacant land in the APZs more attractive to sell and develop.

Preferred industrial development included in the City of Bellevue Comprehensive Plan involves a light industrial complex south of Offutt AFB. This area along with the highway access makes it an ideal location for industrial use. The plan designates the area south of Offutt AFB as "Tier 4 Development," which is developable, but has a high price tag associated with development. The City of Bellevue has been in coordination with Offutt AFB on potential development of the area and will continue to work with the base to ensure compatible development occurs, if the area is developed.

The City of Bellevue has adopted a zoning overlay to prevent incompatible development within the safety zones, noise contours, and height obstruction areas. However, some development would be outside the City of Bellevue, such as in Millis County and the City of Glenwood in Iowa and in the City of Plattsmouth and Sarpy County in Nebraska. These areas do not have regulations to prevent incompatible uses and do not require coordination with Offutt AFB when reviewing development permits for the area. Industrial uses are incompatible tall structures which can create vertical obstructions, bright lights which can produce glare and smoke and steam that can obscure pilot vision.

Existing Tools

Back to the River

Back to the River is a non-profit organization committed to promoting access to both sides of the Missouri River and focuses on education, economic development, environmental protection and archeology. The group also looks at flood control and wants to acquire the land south of Offutt AFB. If some of the land is acquired by Back to the River, this would limit future industrial use. If acquired, they would give it to the Nebraska Game and Parks Commission or Iowa Department of Natural Resources, depending which state the land is in, to establish a wildlife management area, with bird restrictions for BASH.

Findings

- There is about 6,000 acres of undeveloped land along the recently completed US Highway 34 corridor, located south of Offutt AFB.
- Industrial and commercial use are potential future land uses to be developed in the Cities of Bellevue, Glenwood, and Plattsmouth, and Mills County.
- This potential development may interfere with base operation or operation may impact the new development.
- The cities of Glenwood and Plattsmouth, and Mills County have not incorporated any guidelines to prevent incompatible development.

5.13 Land / Air / Sea Space Competition (LAS)

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

Key Terms

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

Technical Background

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

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

Controlled and Uncontrolled Airspace Descriptions

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

Class D Airspace. Use of Class D airspace requires the use of two-way communication with Air Traffic Control, which must be established prior to entering Class D airspace. No transponder is required. VFR flights in Class D airspace must have three miles of visibility, and fly an altitude at least 500 feet below, 1,000 feet above, and 2,000 feet laterally from clouds.

ISSUE LAS-1	**Non-military drones** Due to the lack of coordination with the FAA and / or Offutt AFB, non-military drones could interfere with military operations at Offutt AFB.

Compatibility Assessment

Use of unmanned aerial vehicles (UAVs), commonly called drones, has increased dramatically as they have become cheaper, smaller, and easier to use. By 2020, the FAA expects the number of UAVs being used in US airspace to increase to 30,000. The FAA has a ban on UAVs flying over restricted airspace including national parks, military bases and within a five mile radius of medium and large airports. Yet, pilots and air traffic controllers in the US reported about 150 incidents in 2014 in which UAVs flew too close to airports or aircraft. Technology can be utilized to limit the range of UAVs using geofencing, which uses GPS or RF identification to create a geographic boundary that location-aware devices know to avoid. However, few manufacturers have incorporated this technology in the drones as it is not required.

The FAA Modernization and Reform Act of 2012 established rules for non-commercial/recreational use of model aircraft, which includes civilian use of UAVs. Under these rules, civilian UAVs are limited to 55 pounds and must be operated to ensure they do not interfere with any manned aircraft.

It also establishes that if the UAV is flown within five miles of an airport, the operator must notify the airport operator and the air traffic control tower. The operator must also maintain visual line of sight of the UAV.

The FAA released a proposal governing small commercial UAV operations in February 2015. It sets a weight limit of 55 pounds, speed limit of 100 miles per hour, and height limit of 500 feet. Operators must keep the UAV in sight and avoid hazards, such as restricted airspace, airports, and other planes. It also requires UAV operators to pass an aeronautics test to obtain an operator certificate, but it does not require operators to have an aviator's license. Final rules will take some time and it could be 2017 before the rules are finalized. Until these rules are established, commercial operators must go through the Section 333 exemption process. The exemption process involves filing a petition for exemption, which is granted on a case-by-case basis to perform commercial operations with UAVs. As of March 2015, the FAA granted 69 exemptions. Private recreational UAV use remains regulated under the FAA Modernization and Reform Act of 2012.

In more rural parts of the US, UAVs are becoming increasingly used for agricultural purposes to monitor crops and fields. The UAVs can be programmed to fly low over fields and streams providing photos and videos to a ground station, where the images can be stitched together into maps or analyzed to gauge crop health. They can also be modified to land and take soil and water samples. A 2013 study estimated that future UAV markets would be largely in agriculture.

Most of the area south of Offutt AFB is currently used for agriculture or open space. This area may attract recreational UAV use or farms may begin to utilize the new technology. As the number of UAVs increases, there is potential for increased communication between air traffic control and civilians utilizing UAVs. There will also be the increased risk of UAVs flying into restricted air space without prior coordination. This raises security concerns as many UAVs are equipped with camera equipment. A UAV could provide a line-of-sight into the base.

There is uncertainty as to whether a farmer who decides to use a personal drone to survey as part of the agricultural business and make a profit would be considered a commercial or recreational use of a UAV.

Existing Tools

FAA Modernization and Reform Act of 2012

Section 336 of the FAA Modernization and Reform Act of 2012 establishes special rules for model aircraft, including UAVs. It states that when a UAV is flown within five miles of an airport, the operator of the aircraft must provide the airport operator and the airport air traffic control tower with prior notice of the operation. Model aircraft operators flying from a permanent location within five miles of an airport should establish a mutually-agreed upon operating procedure with the airport operator and the airport air traffic control tower. In June 2014, the FAA issued an Interpretation of the Special Rule for Model Aircraft, which declared that flights within five miles of any airport may be denied by air traffic control.

Integration of Civil Unmanned Aircraft Systems in the National Airspace System Roadmap – First Edition 2013

The Integration of Civil Unmanned Aircraft Systems in the National Airspace Roadmap, created by the FAA, provides a guiding framework for the safe integration of UAVs into the national airspace system. This roadmap explains operational goals, aviation safety, and challenges associated with air traffic when considering future investments in UAVs. The roadmap does not establish policy or regulations for the efficient use of civilian UAVs in the national airspace system.

The roadmap identifies challenges that need to be addressed to improve air traffic operations with UAVs. The goal of safely integrating UAVs without segregating, delaying, or diverting other aircraft and other users of the system presents significant challenges, including:

- Identifying policies and requirements for UAVs to comply with Air Traffic Control clearances and instructions commensurate with manned aircraft;
- Establishing procedures and techniques for safe and secure exchange of voice and data communication between UAV pilots, air traffic controllers, and other airspace users;
- Establishing wake vortex and turbulence avoidance criteria needed for UAVs with unique characteristics; and
- Reviewing environmental requirements.

Nebraska Legislative Bill 412

Nebraska Legislative Bill 412, known as the "Freedom from Unwarranted Surveillance Act," was introduced in January 2013, but has been indefinitely postponed. The bill states that "a law enforcement agency shall not use a drone to gather evidence or other information." The bill does not prohibit the use of a drone to counter a high risk of a terrorist attack by a specific individual or organization. Evidence obtained or collected in violation of the act is not admissible as evidence in a criminal prosecution in any court of law in Nebraska.

Findings

- The newly proposed FAA regulation will only apply to commercially operated UAVs, private recreational UAV use remains regulated under the FAA Modernization and Reform Act of 2012.
- There is a lack of FAA regulation of civilian use of UAVs, yet integration of UAVs into the National Airspace System is currently in progress.
- The FAA expects the number of UAVs being used in US airspace to increase to 30,000 by 2020.
- In more rural parts of the US, UAVs are becoming increasingly used for agricultural purposes to monitor crops and fields.

ISSUE LAS-2	**Potential for runway expansion**
	Due to topographic features on the north end of the runway and the need for runway over runs, there is a desire to expand the runway to the southeast to protect future operations and missions. This would require additional standoff distances outside the current base boundaries.

Compatibility Assessment

There is currently a lack of runway safety areas at both ends of the runway at Offutt AFB, which are utilized to reduce the risk of damage to aircraft in the event it overruns the runway. This limits the types of aircraft able to utilize the runway, which could restrict or limit future missions at the base. The main runway is 11,700 feet in length, but it is constrained on both sides which limits expansion. The runway is constrained to the south due to the railroad and there is limited room to the north due to topography.

There is a desire by groups at Offutt AFB to expand the runway, but currently this is not likely to happen due to land constraints and the location of an existing railroad track on the eastern boundary of the base. A larger concern is to maintain the current runway, including a project to narrow the runway to decrease the amount of maintenance.

Existing Tools

As part of this JLUS effort, no existing tools were identified that address this compatibility issue.

Findings

- Offutt AFB lacks the appropriate safety areas for runway overrun which limits the types of aircraft that can utilize the runway. This restriction could potentially limit future mission at the base.
- The railroad and topography constrain the runway and currently limit any future expansion.

5.14 Land Use (LU)

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

Key Terms

Land Use Planning. Land use planning stems from the Supreme Court decision of *Euclid vs. Ambler* which enabled jurisdictions to regulate land use through zoning land in order to protect the public's health, safety, morals, and welfare. Zoning is a land use regulation tool used by local jurisdictions that generally controls use, density, intensity, building heights, and setbacks on a parcel or lot. Most states, like Nebraska, enacted enabling legislation for local jurisdictions to also create and adopt general or comprehensive plans which are land use documents that broadly establish a vision, goals, policies, and implementation activities for a jurisdiction over a long range period of time, typically ten to twenty years, to promote compatible land use, guide growth and logical development.

Local jurisdictions' general plans and zoning ordinances are the most effective tools to avoid and resolve land use compatibility issues. These tools ensure similar and compatible land uses are properly located and can co-exist while separating land uses that differ significantly in use and potential nuisance.

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

Technical Background

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

Among the most pressing factors causing incompatibility with installations containing a military airfield and weapons training are the proximate areas of encroaching development, as well as off-installation light pollution from that development which may impact the military operations. The development of land uses incompatible with the installations military operations threatens that installation's mission success and its continued existence.

ISSUE LU-1	**Offutt AFB AICUZ Report land use recommendations adoption** Not all of the communities around Offutt AFB utilize the AICUZ recommendations for land use development in aircraft operational areas, which may allow for incompatible development to occur in some areas.

Compatibility Assessment

The purpose of the AICUZ program is to recommend compatible land uses in areas subject to aircraft noise and accident potential. The Offutt AFB AICUZ Report encourages the surrounding jurisdictions to include the recommendations in their planning process and documents. The Accident Potential Zone (APZ) and noise contours only traverse the cities of Bellevue and La Vista and Sarpy and Mills counties. When the AICUZ recommendations are not accepted or adopted in jurisdictional planning documents, then it can lead to potential oversight of noise sensitive or high-density types of development that could be located in the safety and noise sensitive areas of the airfield, hence incompatible development. The AICUZ recommendations were developed to assist communities to protect the general public from aviation impacts such as noise, overflight, and worst case scenario, aircraft collisions.

The City of Bellevue is the only city that has incorporated the AICUZ Report recommendations into its zoning ordinance and references the study in its comprehensive plan. Sarpy County has established an Airport Approach Zone, but this zone does not comprehensively address the land use recommendations of the AICUZ Report.

Existing Tools

Offutt AFB AICUZ Report

The most recent Offutt AFB AICUZ Report was approved in 2007; however, for planning purposes, Offutt AFB and the City of Bellevue use the 1992 noise contours because they are larger than the 2007 AICUZ contours and provide for a larger area to address compatibility in case the contours increase in size in the future. Section 5 of the AICUZ includes implementation and local community responsibilities. The communities' role of implementation is to ensure that development is compatible with accepted planning and development principles and practices.

- Consider continuing to use the larger 1992 AICUZ contours to leave a "buffer zone".
- Continue to incorporate AICUZ policies and guidelines into comprehensive plans.
- Continue to implement height and obstruction ordinances.
- Modify building codes to ensure that new construction has the recommended noise level reductions.
- Continue to inform Offutt AFB of planning and zoning actions that have the potential of affecting base operations.

City of Bellevue AICUZ Overlay

Section 5.29 of the City of Bellevue Zoning Ordinance is established as the AICUZ Overlay District, which provides recommendations to communities for land uses in the APZs and the noise zones. The ordinance clearly adopts the 1992 AICUZ Report recommended land use table for safety and noise. The ordinance applies to new development and any change, expansion, or addition of an existing structure or property. Any development in the overlay requires a separate development permit. It is important to note too that the City of Bellevue has continued to use the larger 1992 AICUZ contours to provide for a buffer area should the opportunity for new missions be evident.

The only issue with this ordinance is that the Department of Defense has updated their instructions for AICUZ programs as of 2015. These AICUZ

recommendations from the 1992 Offutt AFB AICUZ report may be outdated and could be inconsistent with new 2015 recommendations.

Sarpy County Zoning Regulations

Section 27 of the Sarpy County Zoning Regulations provides guidelines for land uses occurring under all flight approach zones extended out along either side of the runways. Height and zoning requirements must meet the latest federal and state regulations and statues. No land uses are allowed which promote the gathering of people for assembly, release any substance that would impair visibility, light or electrical emission that would interfere with operations, or dumping of garbage or facilities that would serve as bird attractants.

While this generally provides some controls for the land uses within the county, the county's ordinance does not directly adopt the AICUZ recommended land use tables that clearly identify uses that are recommended and not recommended for these areas.

Findings

- The City of Bellevue has incorporated the AICUZ Report in its zoning ordinance and comprehensive plan.
- The City of Bellevue's AICUZ overlay district utilizes information from the 1992 Offutt AFB AICUZ Report instead of the 2007 report because the 1992 noise contours were large and provided a greater area of compatibility protection.
- Sarpy, Cass, and Pottawattamie Counties and the City of Omaha have incorporated Airport Zoning into their ordinances, however they do not reference the AICUZ or Offutt AFB specifically.
- The cities of La Vista, Glenwood, Council Bluffs, and Papillion, and Mills Counties have no reference to airport zoning in their ordinances.
- The cities of La Vista, Glenwood, Council Bluffs, Omaha, and Papillion, and Douglas, Sarpy, Cass, Pottawattamie, and Mills Counties have no reference to the AICUZ or Offutt AFB in their comprehensive plans.

ISSUE LU-2	**Additional growth near military operating areas may impair the use of Offutt AFB aviation assets** Undeveloped land in the vicinity of Offutt AFB, such as within the approach and departure corridors, has the potential to be developed with incompatible uses that could impact the ability to safely carry out missions.

Compatibility Assessment

Offutt AFB safety zones are located in the City of Bellevue, Sarpy County, and Mills County. These jurisdictions have kept these zones mostly clear of incompatible uses and are mostly used for agriculture. However, as the area around Offutt AFB continues to grow, these open areas may be developed with development that could be incompatible with base operations.

Existing Land Uses

Figure 5.14-1 illustrates the conditionally compatible and incompatible land uses under the safety zones. There are several conditionally compatible land uses in the clear zones (CZ) and the accident potential zones (APZ). The farm and agriculture trust land are conditionally compatible because if a structure or earth movement were to occur on this land in the CZs, then this use would be deemed incompatible as the CZ is designated as an area that should remain free and clear of any kind of development, including earth movement like stacking bales of hay. The uses identified as "Exempt, N/A, and Other" were given a compatibility assessment of conditionally compatible based on the data that was provided for the study.

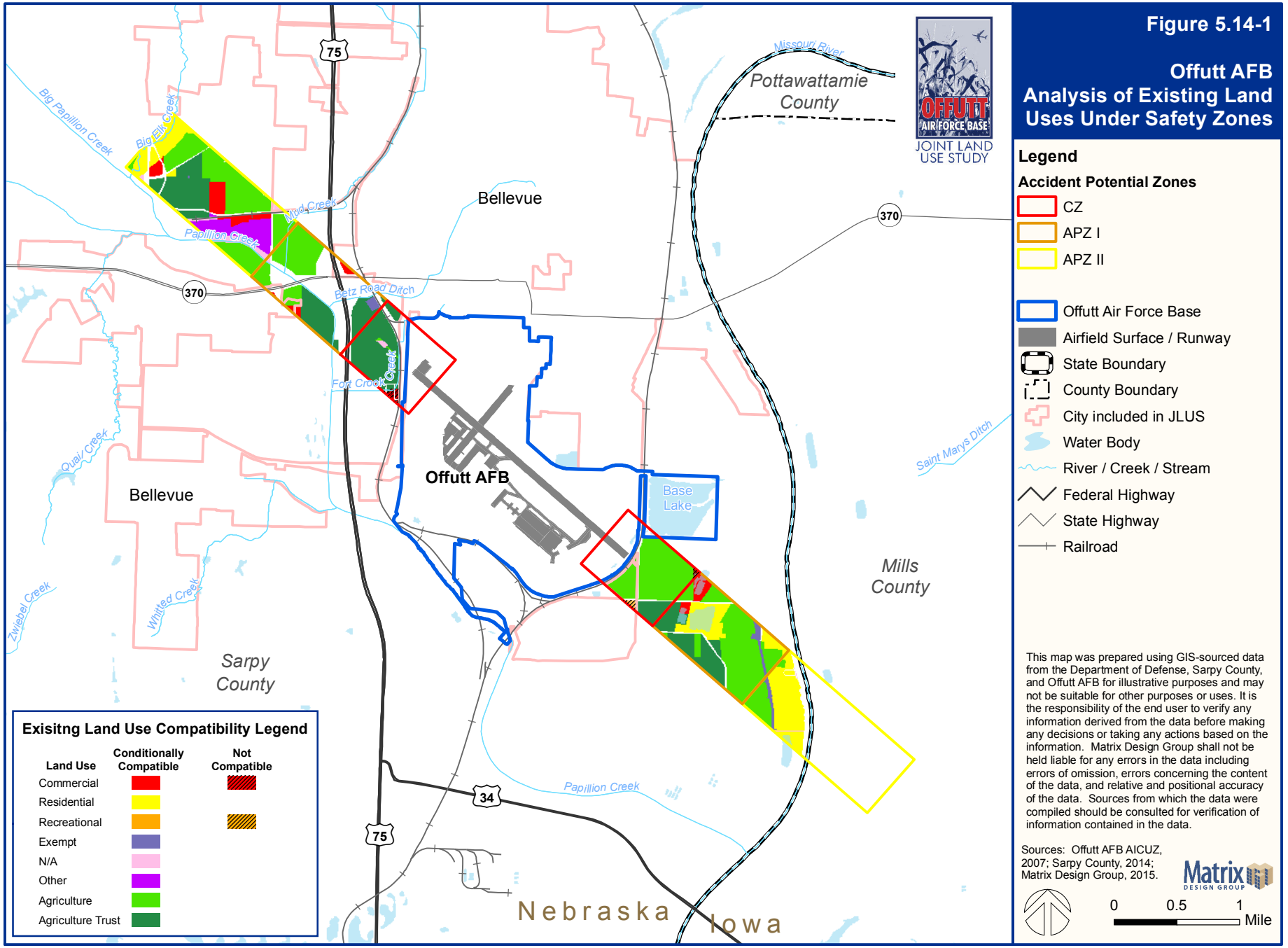


Figure 5.14-1
Offutt AFB
Analysis of Existing Land Uses Under Safety Zones
Legend
Accident Potential Zones
CZ
APZ I
APZ II
Offutt Air Force Base
Airfield Surface / Runway
State Boundary
County Boundary
City included in JLUS
Water Body
River / Creek / Stream
Federal Highway
State Highway
Railroad
Exisitng Land Use Compatibility Legend
Land Use
Conditionally Compatible
Not Compatible
Commercial
Residential
Recreational
Exempt
N/A
Other
Agriculture
Agriculture Trust
Offutt AFB
Bellevue
Bellevue
Pottawattamie County
Sarpy County
Mills County
Nebraska
Iowa
Missouri River
Big Papillion Creek
Big Elk Creek
Mud Creek
Papillion Creek
Betz Road Ditch
Fort Creek
Quail Creek
Zwiebel Creek
Whitted Creek
Saint Marys Ditch
Base Lake
75
370
34
This map was prepared using GIS-sourced data from the Department of Defense, Sarpy County, and Offutt AFB for illustrative purposes and may not be suitable for other purposes or uses. It is the responsibility of the end user to verify any information derived from the data before making any decisions or taking any actions based on the information. Matrix Design Group shall not be held liable for any errors in the data including errors of omission, errors concerning the content of the data, and relative and positional accuracy of the data. Sources from which the data were compiled should be consulted for verification of information contained in the data.
Sources: Offutt AFB AICUZ, 2007; Sarpy County, 2014; Matrix Design Group, 2015.
0
0.5
1
Mile

The data did not provide any details about what those uses were or what uses were permitted in these areas, so in an effort to prevent over-regulation, these areas are deemed as conditionally compatible.

In this existing land uses figure, there are 6.6 acres of commercial uses and 29.9 acres of residential uses that are located within the CZs of the runway; these uses are incompatible with the recommended land uses for the CZs because the CZ should be free from development to prevent unnecessary safety hazards for the general public and pilots. There are 77.3 acres of residential uses located in APZ I and 152.7 acres of residential located in APZ II which are incompatible. These residential uses are incompatible because residential is not a recommended compatible use for APZ I and the densities of the residential in APZ II is recommended at no more than two dwelling units per acre.

Future Land Uses

Figure 5.14-2 shows the compatibility assessment for future land uses under the safety zones. There are several conditionally compatible uses in this area. However, there are 3.4 acres of recreational uses located in the CZ which is the area that is recommended to restrict development of any kind. In addition, there are 2.3 acres of public and semi-public uses located in APZ I and 4.8 acres of residential located in APZ II which are incompatible.

The public and semi-public uses are incompatible because they encourage gatherings of people that could be a hazard to flight operations in this area. The residential uses are incompatible because the densities of the residential in APZ II is recommended at no more than two dwelling units per acre, and medium density residential allows for greater than two units per acre.

It is important to note that while these uses may be shown on future land use maps, Bellevue's zoning overlay for the runway safety zones does not allow uses that are incompatible with the AICUZ recommendations. It could be possible that Bellevue's Comprehensive Plan future land use designations are slightly inconsistent with the zoning ordinance, but they would not supersede the zoning ordinance.

Zoning

Figure 5.14-3 illustrates the compatibility analysis for the zoning under the safety zones of the Offutt AFB airfield. While there are several conditionally compatible zoning districts in this area, there are 5.5 acres of General Business (BG) and 154.8 acres of Heavy Manufacturing (MH) that are located within the CZ, an area that is recommended to be restricted of development for safety purposes. In addition, there are 2.3 acres zoned General Residence – 8,000 square feet (RG-8) that are located in APZ I, which are incompatible. These are incompatible because residential is not a recommended use for APZ I.

In APZ II, there are three residential zoning districts that have been identified in this area. There are 3.4 acres zoned Single-Family Residence – 7,200 square feet (RS-72) that is incompatible because the approximate density would be four dwelling units per acre in an area where it is recommended only two dwelling units per acre. There are 0.5 acres zoned Single-Family Residence – 8,400 square feet (RS-84), which is incompatible because the approximate density would be three units per acre compared to the recommended two units per acre. Finally, there are 4.0 acres zoned Single-Family Residence – 12,000 square feet (RS-120), which is incompatible because the approximate density would be 2.5 units per acre, 0.5 acres exceeding the recommended density for this area.

Higher densities and uses that encourage large gatherings of people are considered to be incompatible for the safety zones of an airfield. It is important to consider this in military compatibility planning.

It is important to note that Figure 5.14-3 does not show the City of Bellevue AICUZ Overlay District. This overlay district was established to protect Offutt AFB from future incompatible development. As such, it restricts certain types of uses in the CZ and APZs that are defined to be incompatible in the Offutt AFB AICUZ.

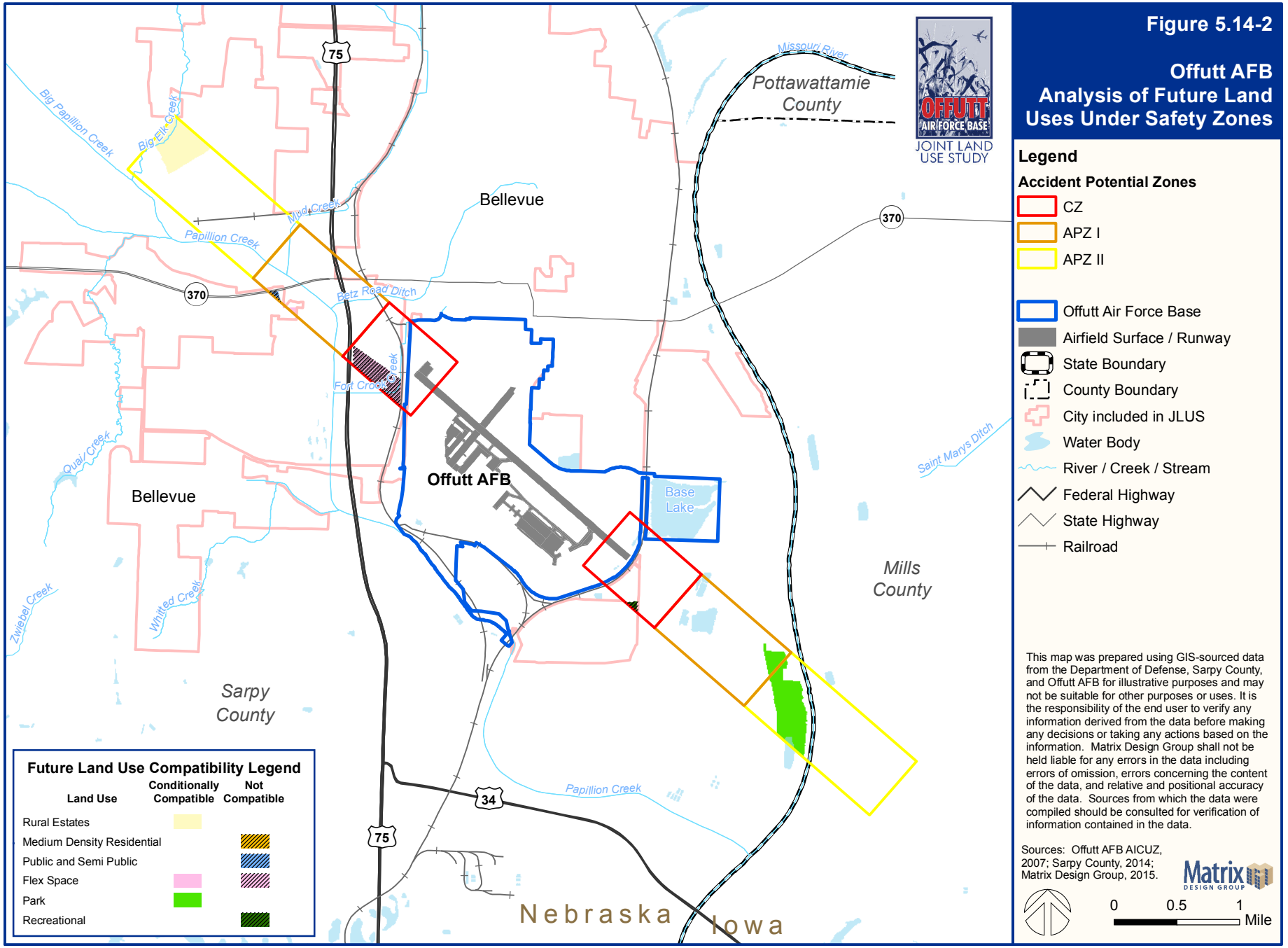


Figure 5.14-2

Offutt AFB Analysis of Future Land Uses Under Safety Zones

Legend

Accident Potential Zones

- CZ
- APZ I
- APZ II

- Offutt Air Force Base
- Airfield Surface / Runway
- State Boundary
- County Boundary
- City included in JLUS
- Water Body
- River / Creek / Stream
- Federal Highway
- State Highway
- Railroad

This map was prepared using GIS-sourced data from the Department of Defense, Sarpy County, and Offutt AFB for illustrative purposes and may not be suitable for other purposes or uses. It is the responsibility of the end user to verify any information derived from the data before making any decisions or taking any actions based on the information. Matrix Design Group shall not be held liable for any errors in the data including errors of omission, errors concerning the content of the data, and relative and positional accuracy of the data. Sources from which the data were compiled should be consulted for verification of information contained in the data.

Sources: Offutt AFB AICUZ, 2007; Sarpy County, 2014; Matrix Design Group, 2015.

Matrix DESIGN GROUP

0 0.5 1 Mile

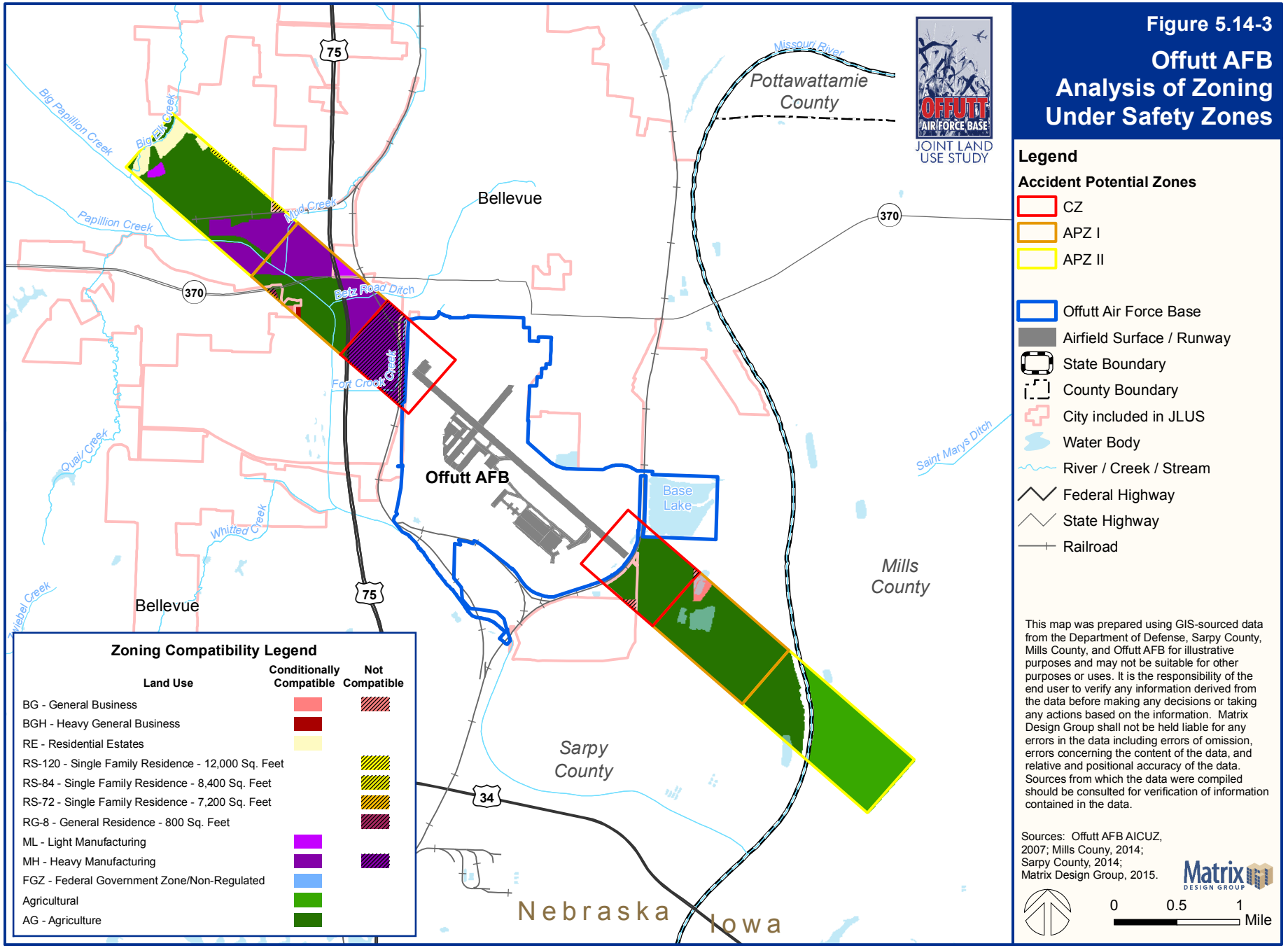


Figure 5.14-3

Offutt AFB Analysis of Zoning Under Safety Zones

Legend

Accident Potential Zones

- CZ
- APZ I
- APZ II

- Offutt Air Force Base
- Airfield Surface / Runway
- State Boundary
- County Boundary
- City included in JLUS
- Water Body
- River / Creek / Stream
- Federal Highway
- State Highway
- Railroad

This map was prepared using GIS-sourced data from the Department of Defense, Sarpy County, Mills County, and Offutt AFB for illustrative purposes and may not be suitable for other purposes or uses. It is the responsibility of the end user to verify any information derived from the data before making any decisions or taking any actions based on the information. Matrix Design Group shall not be held liable for any errors in the data including errors of omission, errors concerning the content of the data, and relative and positional accuracy of the data. Sources from which the data were compiled should be consulted for verification of information contained in the data.

Sources: Offutt AFB AICUZ, 2007; Mills Couny, 2014; Sarpy County, 2014; Matrix Design Group, 2015.

Matrix DESIGN GROUP

0 0.5 1 Mile

The underlying zoning districts and their allowable uses are discussed above, but the overlay district would override these districts and would not allow future incompatible development.

Existing Tools

City of Bellevue Comprehensive Plan

One of the short term recommendations in the City of Bellevue Comprehensive Plan is to make the AICUZ area an asset to the community while protecting Offutt AFB from development encroachment. The plan suggests making the area open space and creating a linear park connecting to other parks and trail systems.

The plan also includes a mid-term recommendation to establish a large industrial park southeast of Offutt AFB. The southeast quadrant of the city is well suited for industrial development. The area's clear separation from residential development is beneficial, as is its proximity to Highway 75 and the newly finished Highway 34.

Back to the River

Back to the River is a non-profit organization committed to promoting access to both sides of the Missouri River and focuses on education, economic development, environmental protection and archeology. The group also looks at flood control and wants to acquire the land south of Offutt AFB. If Back to the River acquired the land, this would prevent additional growth and new development in the area. They plan to give it to the Nebraska Game and Parks Commission or Iowa Department of Natural Resources, depending which state the land is in, to establish a wildlife management area, with bird restrictions for BASH, if acquired.

City of Bellevue Zoning Ordinance

Section 5.29 of the Bellevue Zoning Ordinance establishes an AICUZ Overlay District which divides the AICUZ area into five districts, CZ, APZ I, APZ II, Noise Zones (NZ), and the Height and Obstruction (HO) areas. The section sets standards for the districts, including land use restrictions, concentrations of persons per acre standard, and height restrictions. The standards are applicable to all new development and the expansion of an existing structure.

The zoning overlay district for the runway safety zones matches up with the recommendations provided in the 1992 Offutt AFB AICUZ Report regarding the types of uses that would not be allowed due to incompatibility. Any future development in these zones would be required to adhere to the zoning guidelines and it is unlikely that any future incompatible development (according to the AICUZ guidelines) would be built in the runways safety zones. The zoning districts are included on the City of Bellevue Zoning Map.

Offutt AFB AICUZ Report

The Offutt AICUZ Report contains land use guidelines that can be used and adopted by surrounding jurisdictions as shown in Table 5.14-1. All possible combinations of noise exposure and accident potential are listed, showing land uses that are compatible or incompatible. Although the most recent AICUZ was approved in 2007, land use guidelines from the previous 1992 AICUZ Report were applied to the City of Bellevue Zoning Ordinance. Mills County has not yet applied these guidelines to their zoning ordinance.

Table 5.14-1 AICUZ Land Use Compatibility Table

Land Use		Accident Potential Zone			Noise Zones			
SLUM No.	Name	Clear Zone	APZ I	APZ II	65-70	70-75	75-80	80+
10	Residential							
11	Household units							
1.11	Single units; detached	N	N	Y[1]	A[11]	B[11]	N	N
11.12	Single units; semi detached	N	N	N	A[11]	B[11]	N	N
11.13	Single units; attached row	N	N	N	A[11]	B[11]	N	N
11.21	Two units; side-by-side	N	N	N	A[11]	B[11]	N	N
11.22	Two units; one above the other	N	N	N	A[11]	B[11]	N	N
11.31	Apartments; walk up	N	N	N	A[11]	B[11]	N	N
11.32	Apartments; elevator	N	N	N	A[11]	B[11]	N	N
12	Group quarters	N	N	N	A[11]	B[11]	N	N
13	Residential hotels	N	N	N	A[11]	B[11]	N	N
14	Mobile home parks or courts	N	N	N	N	N	N	N
15	Transient lodgings	N	N	N	A[11]	B[11]	C[11]	N
16	Other residential	N	N	N[1]	A[11]	B[11]	N	N
20	Manufacturing	N	N[2]	Y	Y	Y[12]	Y[13]	Y[14]
21	Food & kindred products; Manufacturing	N	N[2]	Y	Y	Y[12]	Y[13]	Y[14]
22	Textile mill products; manufacturing	N	N	N[2]	Y	Y[12]	Y[13]	Y[14]
23	Apparel and other finished products made from fabrics, leather, and similar materials; manufacturing	N	Y[2]	Y	Y	Y[12]	Y[13]	Y[14]
24	Lumber and wood products (except furniture); manufacturing	N	Y[2]	Y	Y	Y[12]	Y[13]	Y[14]
25	Furniture and fixtures; manufacturing	N	Y[2]	Y	Y	Y[12]	Y[13]	Y[14]
26	Paper & allied products; manufacturing	N	Y[2]	Y	Y	Y[12]	Y[13]	Y[14]

Land Use		Accident Potential Zone			Noise Zones			
SLUM No.	Name	Clear Zone	APZ I	APZ II	65-70	70-75	75-80	80+
27	Printing, publishing, and allied industries	N	Y[2]	Y	Y	Y[12]	Y[13]	Y[14]
28	Chemicals and allied products; manufacturing	N	N	N[2]	Y	Y[12]	Y[13]	Y[14]
29	Petroleum refining and related industries	N	N	Y	Y	Y[12]	Y[13]	Y[14]
30	Manufacturing							
31	Rubber and misc. plastic products, manufacturing	N	N[2]	N[2]	Y	Y[12]	Y[13]	Y[14]
32	Stone, clay and glass products manufacturing	N	N[2]	Y	Y	Y[12]	Y[13]	Y[14]
33	Primary metal industries	N	N[2]	Y	Y	Y[12]	Y[13]	Y[14]
34	Fabricated metal products; manufacturing	N	N[2]	Y	Y	Y[12]	Y[13]	Y[14]
35	Professional, scientific, and controlling instruments; photographic and optical goods; watches and clocks manufacturing	N	N	N[2]	Y	A	B	N

Land Use		Accident Potential Zone			Noise Zones			
SLUM No.	Name	Clear Zone	APZ I	APZ II	65-70	70-75	75-80	80+
39	Miscellaneous manufacturing	N	Y[2]	Y[2]	Y	Y[12]	Y[13]	Y[14]
40	Transportation, communications and utilities							
41	Railroad, rapid rail transit and street railroad transportation	N[3]	Y[4]	Y	Y	Y[12]	Y[13]	Y[14]
42	Motor vehicle transportation	N[3]	Y	Y	Y	Y[12]	Y[13]	Y[14]
43	Aircraft transportation	N[3]	Y[4]	Y	Y	Y[12]	Y[13]	Y[14]
44	Marine craft transportation	N[3]	Y[4]	Y	Y	Y[12]	Y[13]	Y[14]
45	Highway & street right-of- way	N[3]	Y	Y	Y	Y[12]	Y[13]	Y[14]
46	Automobile parking	N[3]	Y[4]	Y	Y	Y[12]	Y[13]	Y[14]
47	Communications	N[3]	Y[4]	Y	Y	A[15]	B[15]	N
48	Utilities	N[3]	Y[4]	Y	Y	Y	Y[12]	Y[13]
49	Other transportation communications & utilities	N[3]	Y[4]	Y	Y	A[15]	B[15]	N
50	Trade							
51	Wholesale trade	N	Y[2]	Y	Y	Y[12]	Y[13]	Y[14]

Land Use		Accident Potential Zone			Noise Zones			
SLUM No.	Name	Clear Zone	APZ I	APZ II	65-70	70-75	75-80	80+
52	Retail trade-building materials, hardware and farm equipment	N	Y[2]	Y	Y	Y[12]	Y[13]	Y[14]
53	Retail trade-general merchandise	N	N[2]	Y[2]	Y	A	B	N
54	Retail trade-food	N	N[2]	Y[2]	Y	A	B	N
55	Retail trade-automotive, marine craft, aircraft and accessories	N	Y[2]	Y[2]	Y	A	B	N
56	Retail trade-apparel and accessories	N	N[2]	Y[2]	Y	A	B	N
57	Retail trade-furniture, home furnishings and equipment	N	N[2]	Y[2]	Y	A	B	N
58	Retail trade-eating and drinking establishments	N	N	N[2]	Y	A	B	N
59	Other retail trade	N	N[2]	Y[2]	Y	A	B	N
60	Services							
61	Finance, insurance and real estate services	N	N	Y[6]	Y	A	B	N
62	Personal services	N	N	Y[6]	Y	A	B	N
62.4	Cemeteries	N	Y[7]	Y[7]	Y	Y[12]	Y[13]	Y[14,21]

Land Use		Accident Potential Zone			Noise Zones			
SLUM No.	Name	Clear Zone	APZ I	APZ II	65-70	70-75	75-80	80+
63	Business services	N	Y[8]	Y[8]	Y	A	B	N
64	Repair services	N	Y[2]	Y	Y	Y[12]	Y[13]	Y[14]
65	Professional services	N	N	Y[6]	Y	A	B	N
65.1	Hospitals, nursing homes	N	N	N	A*	B*	N	N
65.1	Other medical facilities	N	N	N	Y	A	B	N
66	Contract construction services	N	Y6	Y	Y	A	B	N
67	Governmental services	N	N	Y[6]	Y*	A*	B*	N
68	Educational services	N	N	N	A*	B*	N	N
69	Miscellaneous services	N	N[2]	Y[2]	Y	A	B	N
70	Cultural, entertainment and recreational							
71	Cultural activities (including churches)	N	N	N[2]	A*	B*	N	N
71.2	Nature exhibits	N	Y[2]	Y	Y*	N	N	N
72	Public assembly	N	N	N	Y	N	N	N
72.1	Auditoriums, concert halls	N	N	N	A	B	N	N

Land Use		Accident Potential Zone			Noise Zones			
SLUM No.	Name	Clear Zone	APZ I	APZ II	65-70	70-75	75-80	80+
72.11	Outdoor music shell, amphitheaters	N	N	N	N	N	N	N
72.2	Outdoor sports arenas, spectator sports	N	N	N	Y[17]	Y[17]	N	N
73	Amusements	N	N	Y8	Y	Y	N	N
74	Recreational activities (including golf courses, riding stables, water recreation)	N	Y[8,9,10]	Y	Y*	A*	B*	N
75	Resorts and group camps	N	N	N	Y*	Y*	N	N
76	Parks	N	Y[8]	Y[8]	Y*	Y*	N	N
79	Other cultural, entertainment and recreation	N	Y[9]	Y[9]	Y*	Y*	N	N
80	Resources production and extraction							
81	Agriculture (except livestock)	Y[16]	Y	Y	Y[18]	Y[19]	Y[20]	Y[20,21]
81.5 to 81.7	Livestock farming and animal breeding	N	Y	Y	Y[18]	Y[19]	Y[20]	Y[20,21]
82	Agricultural related activities	N	Y[5]	Y	Y[18]	Y[19]	N	N
83	Forestry activities and related services	N[5]	Y	Y	Y[18]	Y[19]	Y[20]	Y[20,21]
84	Fishing activities and related services	N[5]	Y[5]	Y	Y	Y	Y	Y
85	Mining activities and related services	N	Y[5]	Y	Y	Y	Y	Y
89	Other resources production and extraction	N	Y[5]	Y	Y	Y	Y	Y

LEGEND:

SLUCM - Standard Land Use Coding Manual, US Department of Transportation.

Y - (Yes) - Land use and related structures are compatible without restriction.

N - (No) - Land use and related structures are not compatible and should be prohibited.

Yx - (yes with restrictions) - Land use and related structures generally compatible; see notes 1 through 21.

Nx - (no with exceptions) - See notes 1 through 21.

NLR - (Noise Level Reduction) - NLR (outdoor to indoor) to be achieved through incorporation of noise attenuation measures into the design and construction of the structures. See Appendix E, Vol II.

A, B, or C - Land use and related structures generally compatible; measures to achieve NLR for A (DNL 66-70), B(DNL 71-75), C(DNL 76-80), need to be incorporated into the design and construction of structures. See Appendix E, Vol II.

A*, B*, and C* - Land use generally compatible with NLR. However, measures to achieve an overall noise level reduction do not necessarily solve noise difficulties and additional evaluation is warranted. See appropriate footnotes.

* - The designation of these uses as "compatible" in this zone reflects individual federal agencies' and program considerations of general cost and feasibility factors, as well as past community experiences and program objectives. Localities, when evaluating the

application of these guidelines to specific situations, may have different concerns or goals to consider.

NOTES

1. Suggested maximum density of 1-2 dwelling units per acre, possibly increased under a Planned Unit Development (PUD) where maximum lot coverage is less than 20 percent.

2. Within each land use category, uses exist where further definition may be needed due to the variation of densities in people and structures.

3. The placing of structures, buildings, or above-ground utility lines in the clear zone is subject to severe restrictions. In a majority of the Clear Zones, these items are prohibited. See UFC 3-260-01 for specific guidance.

4. No passenger terminals and no major aboveground transmission lines in APZ I.

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

6. Low-intensity office uses only. Meeting places, auditoriums, etc., are not recommended.

7. Excludes chapels.

8. Facilities must be low intensity.

9. Clubhouse not recommended.

10. Areas for gatherings of people are not recommended.

11. a. Although local conditions may require residential use, it is discouraged in DNL 65-70 dB and strongly discouraged in DNL 70-75 dB. An evaluation should be conducted prior to approvals, indicating that a demonstrated community need for residential use would not be met if development were prohibited in these zones, and that there are no viable alternative locations.

b. Where the community determines the residential uses must be allowed, measures to achieve outdoor to indoor Noise Level Reduction (NLR) for DNL 65-70 dB and DNL 70-75 dB should be incorporated into building codes and considered in individual approvals. See Appendix E for a reference to updated NLR procedures.

c. NLR criteria will not eliminate outdoor noise problems. However, building location and site planning, and design and use of berms and barriers can help mitigate outdoor exposure, particularly from near ground level sources. Measures that reduce outdoor noise should be used whenever practical in preference to measures which only protect interior spaces.

12. Measures to achieve the same NLR as required for facilities in DNL 65-70 dB range must be incorporated into the design and construction of portions of these buildings where the public is received, office areas, noise sensitive areas or where the normal noise level is low.

13. Measures to achieve the same NLR as required for facilities in DNL 70-75 dB range must be incorporated into the design and construction of portions of these buildings where the public is received, office areas, noise sensitive areas or where the normal noise level is low.

14. Measures to achieve the same NLR as required for facilities in DNL 75-80 dB range must be incorporated into the design and construction of portions of these buildings where the public is received, office areas, noise sensitive areas or where the normal noise level is low.

15. If noise sensitive, use indicated NLR; if not, the use is compatible.

16. No buildings.

17. Land use is compatible provided special sound reinforcement systems are installed.

18. Residential buildings require the same NLR as required for facilities in DNL 65-70 dB range.

19. Residential buildings require the same NLR as required for facilities in DNL 70-75 dB range.

20. Residential buildings are not permitted.

21. Land use is not recommended. If the community decides the use is necessary, personnel should wear hearing protection devices.

Source: 2007 Offutt AFB AICUZ Report.

Findings

- There is a lot of open land that may attract incompatible development as the area surrounding Offutt AFB continues to grow.
- Mills County has not yet applied AICUZ guidelines to their zoning to prevent incompatible development.
- The City of Bellevue AICUZ Overlay District assists community planners in preventing incompatible development through land use, density, and height restrictions.

5.15 Legislative Initiatives (LEG)

Legislative initiatives are proposed changes in relevant policies, laws, regulations or programs which could potentially have a significant impact on one or more substantive areas of concern to both the facility and to the stakeholder communities. The focus of this compatibility issue is on initiatives with general and broad implications.

ISSUE LEG-1	**Multiple jurisdictional authority on portions of Offutt AFB** There are multiple jurisdictional authorities on portions of Offutt AFB in the northwest corner that place the area under legal jurisdiction of the Sarpy County authorities.

Compatibility Assessment

There are multiple jurisdictional boundaries that divide part of a dormitory in the northwest area of Offutt AFB near Airman Circle. The jurisdiction line cuts down a hallway in the dormitory placing one side of the hallway under Sarpy County jurisdiction and the other under federal jurisdiction. If an incident occurs on one side of the line, Sarpy County Sheriff's Office has jurisdiction and must be contacted to resolve the issue. This is an inconvenience for Sarpy County, which must go through the process of entering the base to reach the area.

In addition to the dormitory area, there is another portion of land near the Kenney Gate that has the same multi-jurisdictional issue.

During an incident at Offutt AFB in June 2012, an unauthorized man entered the base as he was being chased by Sarpy County authorities. Once on-base, a non-military police officer for Offutt AFB apprehended the man. Because this incident involved multiple jurisdictions and enforcement, it is important that jurisdictional boundaries are clear and correct.

Existing Tools

Offutt AFB / Sarpy County Sheriff's Office cooperation

Offutt AFB security forces and the Sarpy County Sheriff's Office have a cooperative agreement that allows shared jurisdiction of the areas on Offutt AFB so that Offutt personnel can maintain security on parts of the base within Sarpy County jurisdiction when needed.

Findings

- Both Sarpy County Sheriff's Office and Offutt AFB agree with changing the jurisdictional boundaries.
- Plans are in place to have the land transferred to Offutt AFB, but it is a lengthy legal process.

ISSUE LEG-2	**Drop in the percentage of military children enrolled in Bellevue School District schools** The reduction in the percentage of military student enrollment within Bellevue schools is due to an increase in civilian students causing a reduction in percentage of military students and alternate housing options for military families outside of Bellevue. The reduction of percentage of military students has resulted in Bellevue no longer being defined as a "highly impacted" community for military students and decreased the Bellevue budget by $5 million dollars, which may cause future constraints that will impact classroom sizes and availability of new supplies.

Technical Background

Impact Aid payments are provided from the Department of Education to local public school districts that educate federally connected students. To determine the amount of aid the school district receives, a formula is used based on a survey of district students. Different types of federal students are assigned a weight to represent the financial impact of the student. Military students residing on federal property are given the basic weight of 1.0 and military students not residing on federal property are given a weight of 0.2. Below is an example of a Basic Support Payment:

> *If a school district had 300 military students living on federal property and 100 military students not living on federal property, its total Weighted Student Units would be 300 x 1.0 (300) plus 100 x .2 (20) or 320.*
> *If the district's Local Contribution Rate was $3,000, its Basic Support Payment would be 320 x 3,000 or $960,000, if the Impact Aid program was fully funded.*

In addition to regular Basic Support payments, some school districts are eligible for additional funding through Heavily Impacted District Payments. To be considered heavily impacted, at least 35 percent of students must be federally connected.

Source: http://www.doe.in.gov/sites/default/files/student-assistance/impact-aid.pdf

Compatibility Assessment

The City of Bellevue has four school districts within its jurisdiction, which are Omaha, Platteview, Bellevue, and Papillion. The drop in the percent of military children has reduced the amount of Impact Aid Bellevue Public Schools receives from the federal government. The school district is given aid to compensate for the lost local property tax base created by federally-owned land, such as Offutt AFB. To determine the amount of aid the school district receives, a formula is used based on a survey of district students. To be considered heavily impacted, at least 35 percent of students must be federally connected. Bellevue Public Schools has not had that percentage of students since 2010. In 2014, only 29 percent of the district's students came from military families.

Bellevue Public Schools still qualifies for Impact Aid Basic Support payments, which requires that three percent of students are federally connected. However, the decline in percentage of federally connected students over the past 10 years has caused a $15 million decrease in aid. In 2004, the district received about $17 million in aid, which contributed 22 percent of the operating budget. In 2014, the district received $2.4 million, which will only contribute 2.4 percent of the operating budget. The district has proposed closing the Welcome Center's Early Childhood Center and eliminating the assistant band director position at each of the three middle schools due to the decreased budget. The district had also planned to build a new facility, but budgeting was previously done using impact aid, which is now limited.

The privatization of base housing in 2005 shrank the number of military students living in the Bellevue School District. Also, growth of the number of non-military members in the community has added a greater percentage of non-federally connected students, which is what the Impact Aid is based on. Another factor that may have contributed to the decreased percentage of military children in Bellevue schools is that military families have more housing options outside of Bellevue and are more willing to move further away from the base than they were before.

Existing Tools

City of Bellevue Comprehensive Plan

One of the mid-term recommendations included in the City of Bellevue Comprehensive Plan is a survey of the members of the Armed Forces regarding housing opportunities in Bellevue, and ask why they choose to live elsewhere. Information obtained from the US Census Bureau revealed that a large number of Offutt personnel live in other communities. A survey

would be a useful tool for determining why more do not choose to live in Bellevue.

Federal Impact Aid Program (Title VIII of the Elementary and Secondary Education Act of 1965)

The Impact Aid Program is designed to directly compensate local school districts for local revenue lost due to the presence of tax-exempt federally owned property and costs incurred due to "federally connected" students, such as the children of armed services personnel working at a nearby military base. Established in 1950, the Impact Aid Program was a major general aid source for 1,151, or approximately eight percent, school districts nationwide in 2014.

Findings

- The military has more options of where to live as nearby cities and towns grow and develop, lowering the military population in the City of Bellevue.
- The decrease in percentage of federally connected children in the City of Bellevue has caused a decrease in aid given to the Bellevue School District.
- The decline in percentage of federally connected students over the past 10 years has caused a $15 million decrease in aid.
- Financial constraints are expected to limit resources, which may lead to reducing resources and programs.
- The City of Bellevue Comprehensive Plan recommends a survey to determine why members of the Armed Forces choose to live elsewhere.
- The City of Bellevue school district has proposed closing the Welcome Center's Early Childhood Center and eliminating the assistant band director position at each of the three middle schools due to the decreased budget.

Please see the next page.

5.16 Light and Glare (LG)

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

Key Terms

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

Light Pollution. This type of pollution is created by the artificial brightening of sky caused by development, including street lights and other man-made sources. This has a disruptive effect on the natural cycles and inhibits the observation of stars and planets and can render night vision devices ineffective.

Technical Background

Under dark sky conditions, the use of night vision goggles (NVG) allows military personnel to view objects up to a distance of 984 feet (300 meters); however, lighting located outside of an installation can decrease the NVG effectiveness to a distance of 164 feet (50 meters). Off-installation lighting, such as street lights or other elevated structures that are lit at night, also produce a halo effect around objects which further reduces visibility and resolution for air and ground personnel. The amount of ambient light experienced on the ground is a function of:

- Intensity of nearby light sources (up to 20 miles away);
- Distance from the sources;
- Spectra of the light sources (blue light decays faster in the atmosphere);
- Density of the cloud deck;
- Height of the cloud; and
- Relative humidity.

When measuring light pollution, the proximity to a community has a significant effect on the amount of light pollution that saturates the sky. Proximity twice as close to a community makes its sky glow appear approximately six times brighter.

Sky glow from communities typically diminishes in the later hours of the night, when businesses close and lights are turned off. As development expands outward from a community, the area and amount of light pollution can increase. Increased light pollution can cause an increase in the amount of sky glow, and ultimately create compatibility issues with military missions.

The impacts of outdoor lighting on the dark skies over Offutt AFB are primarily determined by two principal factors – the amount of developed land (density) and the distance of the developed land from the installation. The relationship between density and distance is best demonstrated using an estimate of urban sky glow called Walker's Law. The relationship captured through the use of this formula was developed based on measurements of sky glow for a number of cities in California. The following formula is used to estimate sky glow at an observing site looking at a zenith angle of 45 degrees toward an urban source:

$$I=C \times P \times R(n)$$

Where:

I = Percent increase of the night sky brightness above the natural background, at 45°down from directly overhead (facing the community, directly overhead is roughly ¼ of this value),

P = Population of the community,

R = Distance, in kilometers, from the observing site to the center of the community,

"C" = 0.01 for "R" values between 10 and 50 km, and

"n" = 2.5 for "R" values between 10 and 50 km

According to the National Oceanic and Atmospheric Administration (NOAA), the assumed radius of a community is a function of its population, ranging from 2.5 km to 24 km. Walker's law applies if the installation is outside the city radius. If located inside the community radius, the sky glow increases in a linear manner toward the center by another factor of 2.5.

Consider the following examples:

Scenario 1: A 100-acre development located two kilometers from the installation with a density of six units per acre (assuming 2.5 persons per household) would impact the sky background by over 260 percent (nearly 663 percent with NOAA factor).

Scenario 2: A 100-acre development located 20 kilometers from the installation with a density of six units per acre (assuming 2.5 persons per household) would impact the sky background by approximately less than 1 percent (just over 2 percent with NOAA factor).

If the density was decreased to one unit per acre, the resulting scenarios would result in the following increased sky glow:

Scenario 1: Approximately 44 percent (almost 111 percent with NOAA factor).

Scenario 2: Approximately less than 1 percent (still less than 1 percent with NOAA factor).

In general, the following trends are demonstrated:

- The more dense the urban development, the greater the potential for light intrusion.
- The closer development is to the installation, the greater the potential for light intrusion.

ISSUE LG-1	**Lighting impacts from future development around Offutt AFB** Increased development around Offutt AFB may include lighting systems that are incompatible with nighttime operations at the base.

Compatibility Assessment

Light pollution, the upward and outward distribution of light, either directly from fixtures or from reflection off the ground or other surfaces, can interfere with military mission activities such as night time training activities and temporarily impair pilot's vision (causing pilot confusion with night vision instrumentation or equipment). It is important that pilots train at night to simulate real combat scenarios. Expanding urban development around Offutt AFB has increased the amount of ambient light in the area. As development continues, night training may become ineffective and no longer possible at the base.

Though the Air Force has not conducted a lighting study that measures and determines how much lighting from nearby development has effected the overall horizon brightening or the darkness of the night sky, the current ambient lighting levels at night cause concern for the military and the training that occurs at Offutt AFB.

Existing Tools

City of Bellevue Zoning Ordinance

The City of Bellevue Zoning Ordinance limits exterior lighting, stating in Section 9.08 lighting shall be restrained in design and excessive brightness shall be avoided. Within the Highway 34 Corridor Overlay (HCO) District for the newly completed extension, in Section 5.35.G, it is specified that exterior lighting shall be hooded so that direct beam of any light sources will not glare skyward. In Section 5.29 for the AICUZ Overlay District, land use

restrictions for the Area with Height and Obstruction Criteria prevents any uses which produce light emissions, either direct or indirect (reflective), which would interfere with pilot vision.

City of Plattsmouth Zoning Ordinance

City of Plattsmouth Zoning Ordinance limits lighting in Section 10-5 under General Regulations and states that light must not be directed onto an adjoining property or onto a public street or highway. Section 5-3 outlines the regulations for the Civic Corridor Design Overlay District, which provides restrictions on exterior illumination that ensure no direct light is cast upon any residential property and so that no glare is visible to any traffic on any public street. However, the city may approve exceptions to these requirements for sports and athletic field lighting, flagpole lighting, public street lighting, temporary lighting for seasonal/holiday or special events, and lighting used for public safety.

City of La Vista Zoning Ordinance

The City of La Vista Zoning Ordinance regulates outdoor lighting in areas zoned commercial and industrial to ensure no direct light is cast upon any residential property and so that no glare is visible to any traffic on any public street. Sections 5.15 and 5.17 outline the lighting restrictions within the Gateway Corridor District and Planned Unit Development Overlay Districts, which must be directed downward and excessive brightness should be avoided. Additionally, lighting in the districts must be designed to a standard that does not impact adjoining properties, especially residential areas (i.e. Dark Sky compliant).

Cass County Zoning Regulations

The intent of Section 506.8 Exterior Lighting of the Cass County Zoning Regulations is to encourage the exterior lighting practices that preserve safety and functionality and minimize adverse impacts on adjacent properties and the nighttime sky. Light sources for safety and functionality are required to use fully shielded fixtures that are shielded in such a manner that light rays emitted by the fixture are projected below the horizontal from the lowest point of the bulb within the fixture.

Sarpy County Zoning Regulations

Sections 32.4 and 32.6 in the Sarpy County Zoning Regulations outline design guidelines for industrial, commercial, and office uses, which limit exterior lighting to low-level incandescent spotlights, floodlights, and similar illuminating devices hooded in such a manner that the direct beam of any light sources will not glare upon adjacent property or public streets. However, the county may approve exceptions to these requirements for sports and athletic field lighting, flagpole lighting, public street lighting, temporary lighting for seasonal/holiday or special events, and lighting used for public safety.

The Airport Approach Zone District in Section 27 of the Sarpy County Zoning Regulations restricts land use under approach zones. Section 27.4.3 restricts the use of land that allows light emissions which might interfere with or impair pilot vision.

City of Omaha Zoning Regulations

Section 44-238 of the City of Omaha Zoning Regulations covers lighting regulations. Exterior lighting fixtures shall be positioned to direct light away from the immediately abutting residential properties and public ways. Section 44-237 outlines exceptions, which includes lighting restrictions around and on airport property, Eppley Airfield, and lighting is controlled by the airport authority.

During this JLUS process, it was discussed that this issue was a concern; however after review of the jurisdictions' ordinances the regulations were deemed appropriate for this issue. However if future development warrants the need to review lighting regulations among the jurisdictions, then the communities should work with Offutt AFB to ensure proposed new regulations will have a positive impact and solve the issues.

Please see the next page.

5.17 Marine Environments (MAR)

Regulatory or permit requirements protecting marine and ocean resources can cumulatively affect the military's ability to conduct operations, training exercises, or testing in a water-based environment.

There were no issues identified for Marine Environments in this JLUS.

Please see the next page.

5.18 Noise (NOI)

Sound that reaches unwanted levels is referred to as noise. The central issue with noise is the impact, or perceived impact, on people, animals (wild and domestic), and general land use compatibility. Exposure to high noise levels can have a significant impact on human activity, health, and safety. The decibel (dB) scale is used to quantify sound intensity. To understand the relevance of decibels, a normal conversation often occurs at 60 dB, while an ambulance siren from 100 feet away is about 100 dB. Noise associated with military operations (arrival/departure of military aircraft, firing of weapons, etc.) may create noises in higher dB ranges.

Key Terms

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

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

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

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

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

Noise Contour. Noise contours consist of noise impact lines constructed by connecting points of equal noise level measured in dB and identify areas on a map that fall within that particular dB noise contour.

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

NOISEMAP Program. The Department of Defense noise models are based on NOISEMAP technology, using linear acoustics and an integrated formulation to determine the impact of noise.

Technical Background

Due to the technical nature of this resource topic and its importance to the JLUS process, this section provides a discussion of the characteristics of sound and the modeling process used to evaluate noise impacts.

Characteristics of Sound

It is important to understand that there is no single perfect way of measuring sound, due to variations used by different entities when conducting sound studies or sound modeling. Sound is characterized by various parameters that include the oscillation rate of sound waves (frequency), the speed of propagation, and the pressure level or energy content (amplitude). The sound pressure level has become the most common descriptor used to characterize the loudness of an ambient sound level. The decibel (dB) scale is used to quantify sound intensity. Because

sound pressure can vary by over one trillion times within the range of human hearing, a logarithmic loudness scale, i.e., the dB scale, is used to present sound intensity levels in a convenient format.

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

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

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

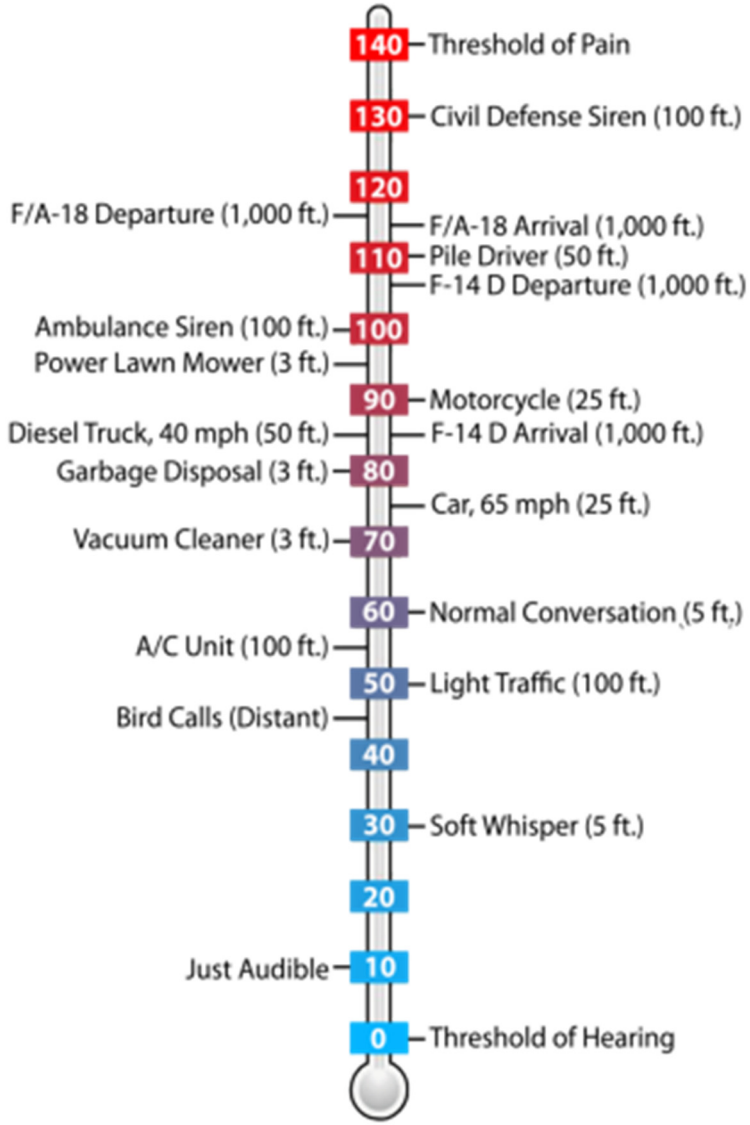


Figure 5.18-1. Sound Levels Comparison in dB

ISSUE NOI-1	**Noise from aircraft operations** The aircraft operations that occur at Offutt AFB produce noise that can be heard outside the boundaries of the base, within surrounding communities.

Compatibility Assessment

AICUZ noise contours describe the noise characteristics of specific aircraft operational environments, and as such, change over time as operational changes occur. The most recent noise contours were created in 2007 when the AICUZ Report was updated. These contours are smaller than the previous 1992 contours due to the improved engine technology and changing of aircraft. The 2007 contours reflect the most current aircraft activities, yet if a new mission is established at Offutt AFB, the noise contours could expand beyond the 2007 contours.

Both Sarpy County and City of Bellevue use the 1992 AICUZ noise contours on their zoning maps. The 65 dB noise contour goes over parts of the cities of Bellevue and La Vista and Mills and Sarpy County. Zoning within the 65 dB and the 70 dB noise zones is generally compatible and mostly zoned agriculture and industrial. There are some areas in the City of Bellevue zoned Residential, which is compatible, under the condition that the interior noise level is reduced by 25 dB, 35 dB and so on through appropriate noise attenuation measures. There has been residential development within the 65 dB and 70 dB noise zones, but it is undetermined if noise attenuation was utilized.

WC 135W aircraft performing touch-and-go operations at Offutt AFB

Figures 5.18-2, 5.18-3, and 5.18-4 illustrate the noise contours and the existing land uses, future land uses, and zoning underneath, respectively. It is important to note that the City of Bellevue and Sarpy County utilize the larger noise contour footprint (1992 data) in their planning documents to protect the military mission and enable for potential increased missions at Offutt AFB in the future.

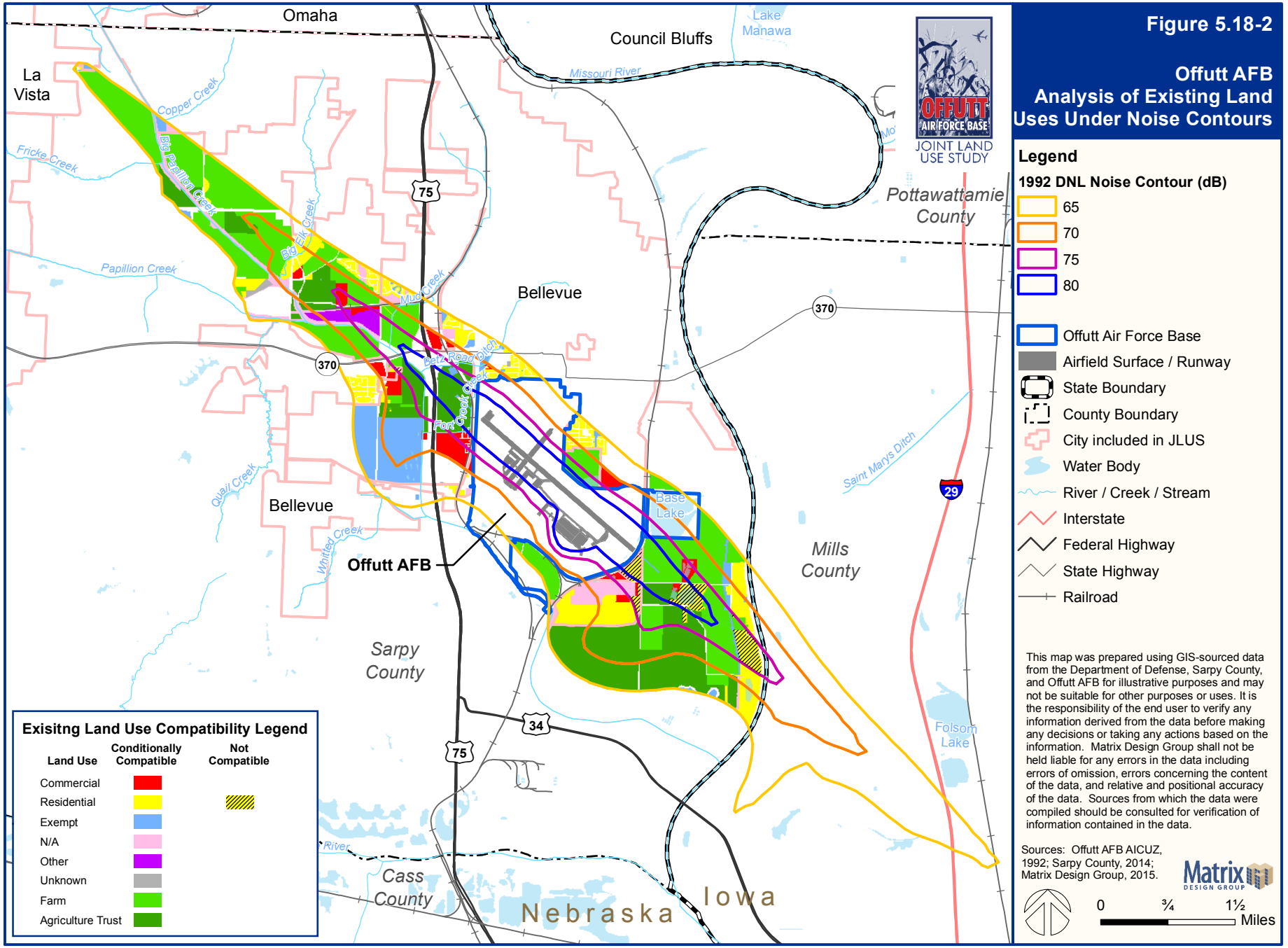


Figure 5.18-2

Offutt AFB Analysis of Existing Land Uses Under Noise Contours

Legend

1992 DNL Noise Contour (dB)

- 65
- 70
- 75
- 80

- Offutt Air Force Base
- Airfield Surface / Runway
- State Boundary
- County Boundary
- City included in JLUS
- Water Body
- River / Creek / Stream
- Interstate
- Federal Highway
- State Highway
- Railroad

Exisitng Land Use Compatibility Legend

Land Use	Conditionally Compatible	Not Compatible
Commercial		
Residential		
Exempt		
N/A		
Other		
Unknown		
Farm		
Agriculture Trust		

This map was prepared using GIS-sourced data from the Department of Defense, Sarpy County, and Offutt AFB for illustrative purposes and may not be suitable for other purposes or uses. It is the responsibility of the end user to verify any information derived from the data before making any decisions or taking any actions based on the information. Matrix Design Group shall not be held liable for any errors in the data including errors of omission, errors concerning the content of the data, and relative and positional accuracy of the data. Sources from which the data were compiled should be consulted for verification of information contained in the data.

Sources: Offutt AFB AICUZ, 1992; Sarpy County, 2014; Matrix Design Group, 2015.

Matrix DESIGN GROUP

0 ¾ 1½ Miles

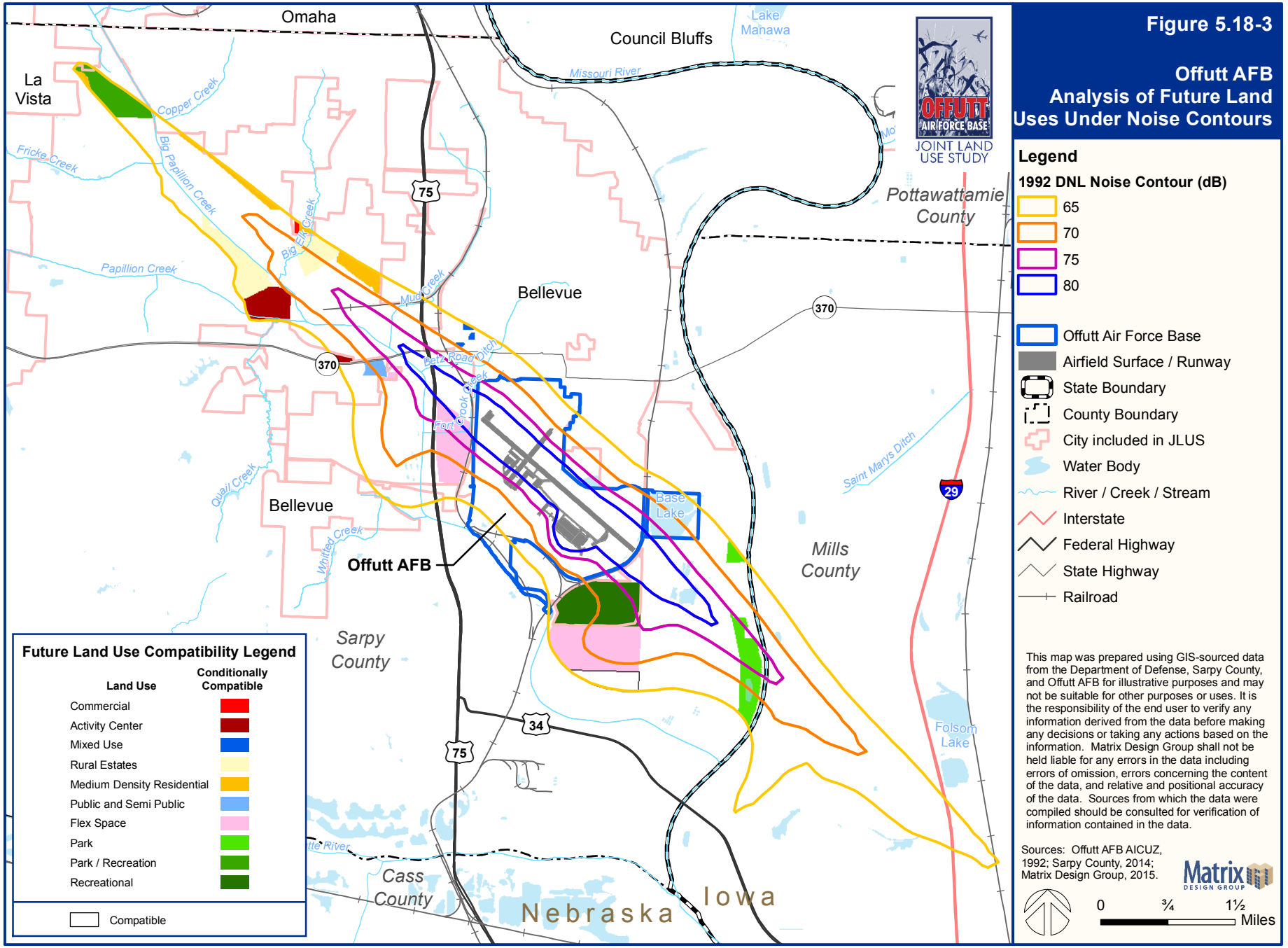


Figure 5.18-3

Offutt AFB Analysis of Future Land Uses Under Noise Contours

Legend

1992 DNL Noise Contour (dB)

- 65
- 70
- 75
- 80

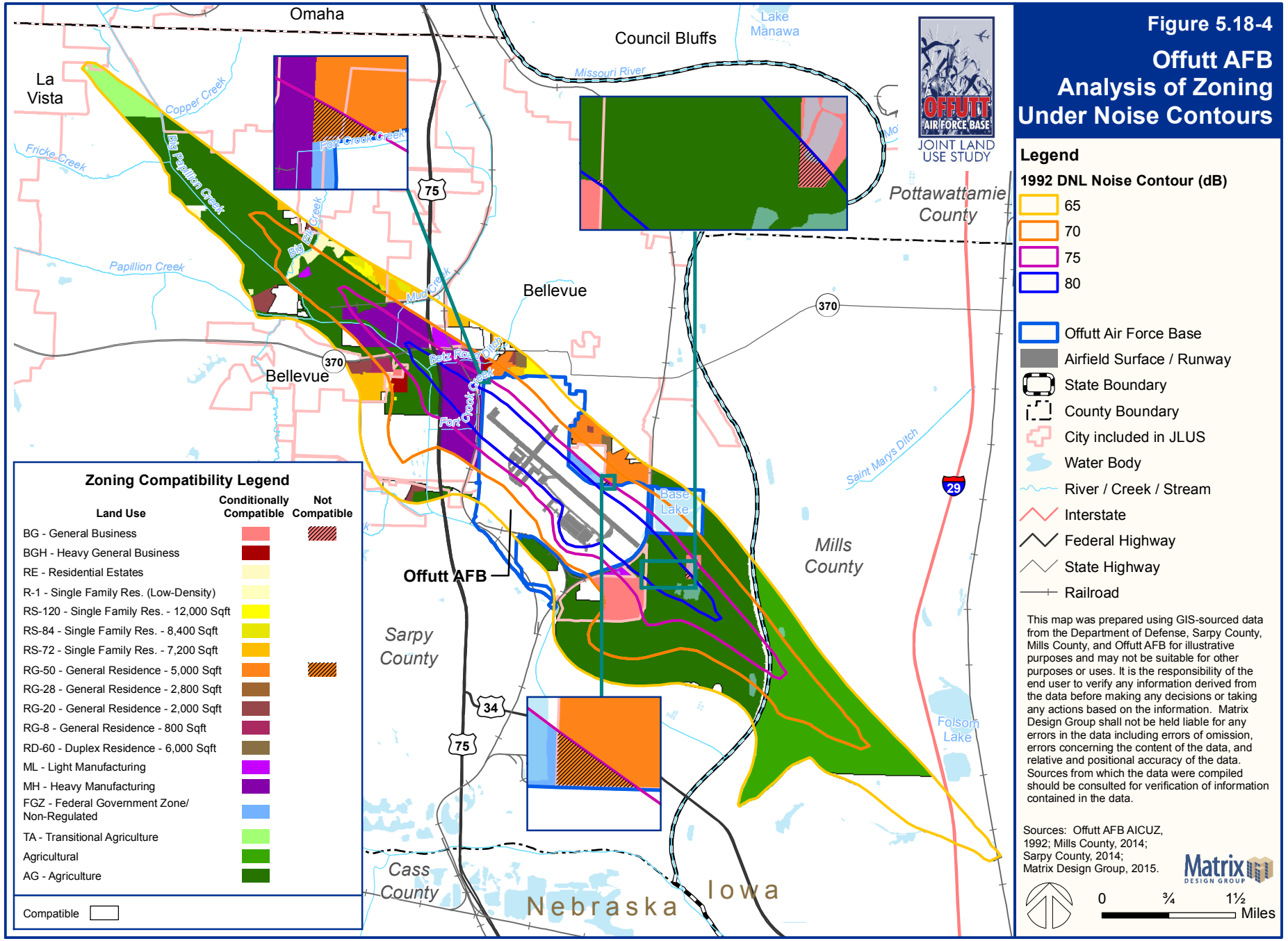
- Offutt Air Force Base
- Airfield Surface / Runway
- State Boundary
- County Boundary
- City included in JLUS
- Water Body
- River / Creek / Stream
- Interstate
- Federal Highway
- State Highway
- Railroad

This map was prepared using GIS-sourced data from the Department of Defense, Sarpy County, and Offutt AFB for illustrative purposes and may not be suitable for other purposes or uses. It is the responsibility of the end user to verify any information derived from the data before making any decisions or taking any actions based on the information. Matrix Design Group shall not be held liable for any errors in the data including errors of omission, errors concerning the content of the data, and relative and positional accuracy of the data. Sources from which the data were compiled should be consulted for verification of information contained in the data.

Sources: Offutt AFB AICUZ, 1992; Sarpy County, 2014; Matrix Design Group, 2015.

Matrix DESIGN GROUP

0 ¾ 1½ Miles



Zoning Compatibility Legend

Land Use	Conditionally Compatible	Not Compatible
BG - General Business		
BGH - Heavy General Business		
RE - Residential Estates		
R-1 - Single Family Res. (Low-Density)		
RS-120 - Single Family Res. - 12,000 Sqft		
RS-84 - Single Family Res. - 8,400 Sqft		
RS-72 - Single Family Res. - 7,200 Sqft		
RG-50 - General Residence - 5,000 Sqft		
RG-28 - General Residence - 2,800 Sqft		
RG-20 - General Residence - 2,000 Sqft		
RG-8 - General Residence - 800 Sqft		
RD-60 - Duplex Residence - 6,000 Sqft		
ML - Light Manufacturing		
MH - Heavy Manufacturing		
FGZ - Federal Government Zone/ Non-Regulated		
TA - Transitional Agriculture		
Agricultural		
AG - Agriculture		

Compatible

Figure 5.18-4

Offutt AFB Analysis of Zoning Under Noise Contours

Legend

1992 DNL Noise Contour (dB)

- 65
- 70
- 75
- 80

- Offutt Air Force Base
- Airfield Surface / Runway
- State Boundary
- County Boundary
- City included in JLUS
- Water Body
- River / Creek / Stream
- Interstate
- Federal Highway
- State Highway
- Railroad

This map was prepared using GIS-sourced data from the Department of Defense, Sarpy County, Mills County, and Offutt AFB for illustrative purposes and may not be suitable for other purposes or uses. It is the responsibility of the end user to verify any information derived from the data before making any decisions or taking any actions based on the information. Matrix Design Group shall not be held liable for any errors in the data including errors of omission, errors concerning the content of the data, and relative and positional accuracy of the data. Sources from which the data were compiled should be consulted for verification of information contained in the data.

Sources: Offutt AFB AICUZ, 1992; Mills County, 2014; Sarpy County, 2014; Matrix Design Group, 2015.

Matrix DESIGN GROUP

0 ¾ 1½ Miles

Existing Land Uses

As illustrated in Figure 5.18-2, there are several existing land uses that are conditionally compatible meaning sound attenuation measures or noise level reduction measures are recommended for the various uses. The existing land uses identified as Exempt, N/A, Other, and Unknown were given a compatibility analysis category of conditionally compatible as it is unknown what type of uses define this existing land use.

Relative to incompatible existing land uses, there are 96.7 residential acres located in the 75 dB noise contour and 67.2 residential acres in the 80 dB noise contours. These uses are incompatible because it is determined that sound attenuation measures would not be able to attenuate the interior noise level to a 45 dB level.

Future Land Uses

Figure 5.18-3 illustrates the future land uses under the various noise contours of the airfield. It should be noted that the future land use data was provided by Sarpy County; however, GIS data from the City of Bellevue has not yet been received. This analysis was performed using the comprehensive map found on the city's website. The figure shows there are various future land uses that are conditionally compatible, but there are no uses that are incompatible based on the data provided.

Zoning

Figure 5.18-4 illustrates the zoning under the noise contours. As shown in the figure there are several conditionally compatible zoning districts under the various noise contours that are recommended to have noise level reduction measures in place before any new development occurs. There are over 62 acres zoned Federal Government Zone (FGZ) / Non-regulated that are located in both the 75 dB and 80 dB noise contours; however, because the data provided only indicated this was a non-regulated area and permitted uses cannot determined, then this area was analyzed as conditionally compatible so as not to appear as overly regulating.

There are 2.3 acres zoned General Residence 5,000 square feet (RG-50), located under the 75 dB noise contour, this is incompatible as noise attenuation measures would not be able to mitigate for appropriate interior noise levels (45 dB) and the density is too high for this area. The density for this zoning district is approximately eight dwelling units per acre, which is incompatible by the AICUZ recommended guidelines. Additionally, there are 3.3 acres zoned General Business (BG) located under the 80 dB noise contour. This is an incompatible use because sound attenuation measures would not be able to mitigate interior noise levels to an appropriate level. While there are not a lot incompatible uses, the uses that are incompatible can adversely impact people inhabiting the uses.

In addition, a majority of the land under the noise contours is zoned agriculture. Agriculture is typically compatible with airfield operations; however, the figure shows this zoning district as conditionally compatible due to any residential structures that may be located on this land should have interior noise level reductions to achieve at a minimum a 45 dB.

Existing Tools

Offutt AFB AICUZ Report

Table 5.14-1 in the Land Use Section of this chapter provides the AICUZ Report land use compatibility guidelines for land uses within the noise zones. Noise zones 75-80 dB and 80+ dB are the most restrictive zones, especially for noise sensitive uses, such as residential use because as mentioned earlier it is highly unlikely that building materials can be used to mitigate the interior noise level to a minimum of 45 dB. Noise zones 70-75 dB and 65-70 dB are less restrictive, but recommend Noise Level Reduction measures to a 45 dB for noise sensitive uses.

City of Bellevue Zoning Ordinance

Section 5.29.06.1 of the City of Bellevue Zoning Ordinance establishes land use restrictions for noise zones. Restrictions are taken directly from the 1992 Offutt AFB AICUZ Report. Uses such as residential, places of public accommodation, and administrative or professional offices are categorized as noise sensitive land uses. These uses are often either considered incompatible or conditionally compatible, under the condition that Noise Level Reduction is achieved through noise attenuation measures.

Findings

- Some areas are zoned residential, which are either incompatible or require noise attenuation due to densities and the building materials would not be able to attenuate sound appropriately.
- The Mills County Zoning Ordinance does not address the impact of noise from Offutt AFB.
- Catfish Lake Restaurant is within both the 75 and 80+ dB noise zones, which is an incompatible use.

5.19 Public Trespassing (PT)

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

There were no issues identified for Public Trespassing in this JLUS.

Please see the next page.

5.20 Roadway Capacity (RC)

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

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

Key Terms

Level of Service. A common measurement used by traffic engineers to determine the effectiveness of a traffic system is a grading system called Level of Service (LOS) which assigns a letter grade from A to F to roadways and intersections based upon traffic flow and safety characteristics as shown in Table 5.20-1.

Table 5.20-1 Level of Service of Roadway

LOS		Definition
ACCEPTABLE	A	Represents a free-flow operation. Vehicles are almost completely unimpeded in their ability to maneuver within the traffic stream.
	B	Represents reasonably free-flow operation. Ability to maneuver within the traffic stream is slightly restricted.
	C	Represents a traffic flow with speeds near or at free-flow speed of the freeway. There is noticeable restricted ability to maneuver within the stream of traffic.
	D	Speeds begin to decline with increased density. Ability to maneuver within the traffic stream is noticeably limited.
UNACCEPTABLE	E	Operation is at capacity. Vehicles are closely spaced within the traffic stream and there are no useable gaps to maneuver.
	F	A breakdown of vehicle flow is present. This condition exists within the queues forming behind the breakdown points.

Roadway Capacity. Roadway capacity refers to the ability of existing freeways, highway, arterials and other local roads to provide adequate mobility and access among military installations and their surrounding communities.

Time Shifting. Time Shifting is moving from one period in time to another period. In this instance, time shifting is utilizing different start times for some eligible personnel.

ISSUE RC-1	**Potential increase in employee traffic following the completion of the STRATCOM building** When it is completed, Offutt AFB's new STRATCOM building may increase the amount of traffic outside the STRATCOM Gate, which may impact local civilian traffic.

Compatibility Assessment

The new STRATCOM building location will change the traffic pattern as a large part of the base population moves into the new building. The new building will be located directly inside the STRATCOM Gate, which is projected to increase the amount of traffic utilizing the gate. Over 3,500 military and civilian employees will work in the building. A few security and technical personnel will move into the building soon after it opens in 2016. But most of the civilian and military employees are not scheduled to move into the building until 2018. Plans were in place to add more lanes to the STRATCOM Gate, but the final decision was to maintain the existing two lanes.

If traffic congestion occurs due to the new STRATCOM building, military mission activities may be delayed, resulting in lost productive hours. In addition, traffic congestion can also affect the surrounding community if vehicle queuing at the gate extends out to Fort Crook Road, delaying civilian traffic. This can cause frustration and annoyance for nearby commuters. Offutt AFB currently uses time shifting, using different start times for different groups to spread out vehicle loads at the gates and to reduce the amount of traffic. However, it is undetermined if this will help with congestion following the opening of the new building.

Current Offutt AFB STRATCOM Gate

Existing Tools

Installation Development and Design

The Offutt Installation Development and Design recommends the consideration of an additional gate on the east side of the base or the reopening of the closed East Gate. An additional gate could relieve traffic and congestion at other gates, especially the STRATCOM Gate. Traffic is expected to increase south of the base now that the Highway 34 extension is complete and with the new STRATCOM building. The reopening of East Gate, or development of a new gate on the east side of the base, would be dependent upon budget / funding, of which none is currently allotted for.

Careful consideration should be given during any future redesign of the Kenney and Bellevue Gates. Improvements will be made to SAC Boulevard, a major north-south road on the base, associated with the new STRATCOM building. Street improvements will improve traffic flow by widening the southern section from two lanes to four lanes.

Findings

- The new STRATCOM building will move the base population from the north central area of the base to the southwest corner.
- The STRATCOM personnel utilize time shifting to reduce vehicular miles traveled during peak morning hours.
- There have been several recommendations for improving roadways, intersections, and modifying work schedules to accommodate increased traffic numbers as delineated in the Offutt Installation Development and Design.

ISSUE RC-2	**Highway projects may increase commuting traffic from areas south of Offutt AFB** The expansion of Highway 75 and completion of Highway 34 may cause an increase in traffic from employees commuting to Offutt AFB from Plattsmouth, Buccaneer Bay, Beaver Lake, Glenwood, and other areas south of the base.

Compatibility Assessment

The US Highway 34 Missouri River Connector improvement, completed in October 2014, provides an improved vehicular connection between Interstate 29 in Iowa and US Highway 75 in Nebraska. The new connection provides a faster way for commuters in Iowa to cross the Missouri River and access Offutt AFB. The new route is projected to be highly utilized.

The US Census Bureau found that 31 percent of residents in Mills County commuted to Bellevue for the years 2004 to 2006. Traffic modeling done by the Iowa Department of Transportation indicates that travel times between Glenwood, IA and Bellevue, NE will be reduced by more than eight minutes. However, the decreased travel time has the potential attract more employees of Offutt AFB to areas in Iowa and south of the base. The highway improvements in the area, which are intended to reduce congestion, may actually increase congestion in the future by attracting more users to the new highway.

Existing Tools

Installation Development and Design

A development consideration in the Offutt AFB Installation Development and Design is to reopen the base's East Gate, which is no longer in operation. If a large number of commuters use Highway 34 to access the base, the STRATCOM Gate could be heavily used due to proximity. This could cause delays to military mission activities for STRATCOM personnel, which could overall affect military readiness.

Findings

- The US Highway 34 Missouri River Connector opened in October 2014 and future impacts are uncertain.
- The US Highway 34 Missouri River Connector has the potential to improve the commute from Iowa to the base.
- The improved route may increase the number of personnel who utilize the STRATCOM Gate.

Please see the next page.

5.21 Safety (SA)

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

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

Key Terms

Area Operations Area (AOA). The Area Operations Area is an area that encompasses all the airport's approach or departure airspace including the circling space.

Accident Potential Zone I (APZ I). APZ I is an area beginning at the end of each clear zone (see definition below) and continuing out to a length of 5,000 feet long by 3,000 feet wide. APZ I follows a curved shape to reflect the predominant flight tracks, and can even split to reflect differences in standard approaches/departures and closed pattern tracks. This area has a lower potential for accidents and therefore has less restrictive development restrictions recommended.

Accident Potential Zone II (APZ II). APZ II is an area that begins at the end of each APZ I and extends an additional 7,000 feet long by 3,000 feet wide. This APZ can also be curved as the flight tracks are considered in designating this APZ. Again, the accident potential in this area reduces further, and with this, some additional development types are allowed.

Bird / Wildlife Aircraft Strike Hazard (BASH). BASH refers to the likely occurrence for a collision between an airborne animal (usually a bird) and a human-made vehicle, particularly aircraft.

BASH Relevancy Area. The BASH Relevancy Area is a 5-statute mile area from the airport operational area, including the runway. This area has been determined by the FAA as an area where BASH incidences are likely to occur due to the types of flying operations that occur near the airfield, such operations are typically at slower speeds and lower altitudes making the conditions for BASH opportune.

Clear Zone (CZ). The CZ is the area that has the highest statistical potential of an aircraft incident (but again, a very low probability). As the name reflects, this area should be kept clear of all structures, including fences. A CZ begins at the physical end of a runway and extends outward, typically covering an area that is 3,000 feet wide by 3,000 feet long. Offutt AFB's CZs are different than the typical CZs because the operational end of the runway ends before the physical end of the runway. As a result, the CZs or Offutt are larger than normal so that the base can protect the maximum amount of land based on the physical end of the runway. Offutt AFB's CZ on the northwestern end of the runway is 3,000 feet wide by 3,800 feet long and the CZ on the southeastern end of the runway is 3,000 feet wide by 3,997 feet long.

ISSUE SA-1	**Habitat for wildlife surrounding Offutt AFB**
	Vegetation and water sources, including the Schilling Wildlife Management Area, Gifford Point Wildlife Management Area, Base Lake, Catfish Lake, and Missouri River nearby Offutt AFB can promote nesting habitats for birds and pose a safety hazard for flight operations.

Offutt AFB's location close to the Missouri River puts it in proximity to several areas that are home to many types of wildlife. The presence of large amounts of birds in the region causes safety risks for pilots and aircraft operating at Offutt AFB. These concerns are discussed in Issue BIO-2 earlier in this chapter, and are not stated here for the sake of minimizing repeat information. Please see Issue BIO-2 for more information on the safety issues associated with bird and wildlife strikes.

ISSUE SA-2	**Existing uses in runway safety zones**
	There are some incompatible uses that currently exist within the runway safety zones that were established prior to the AICUZ zoning overlay.

Compatibility Assessment

Airfields have designated safety zones composed of Clear Zones (CZ) and Accident Potential Zones (APZ) that extend out from each end of a runway. Development is a concern in these areas because this is statistically where aircraft accidents are more likely to occur. The AICUZ report provides recommendations for compatible land uses within the safety zones. Incompatible development in these areas increases the safety risk for the general public and the pilot.

The CZs are the most hazardous considering it is the area closest to the end of the runway where accidents are more likely to occur. The AICUZ Report recommends that only Open Space and Agricultural uses (without structures—no movement of Earth should take place) should be allowed in the CZ. The CZs start at the ends of the runway. The northwestern CZ measures 3,000 wide long by 3,800 feet long and the southeastern CZ measures 3,000 feet wide by 3,997 feet long. It is common for the installation to either purchase the land to prevent development or obtain an easement for the land within the CZ.

The APZs are the second most hazardous area, located just beyond the CZ. APZ I is 3,000 feet wide by 5,000 feet long and starts at the end of CZ and extends to a length of 5,000 feet. APZ II is 3,000 feet wide by 7,000 feet long and is located beyond APZ I. Since these areas are further away from the runway where the probability of accidents is lessened, it is not necessary for acquisition or an easement. However, since there still is a high risk, it is strongly encouraged that land uses are carefully planned and controlled for the protection of the public.

Two existing uses have been identified as potentially incompatible with Offutt AFB AICUZ recommendations. There is a chlorine plant, owned by DPC Industries, Inc., located in the northern APZ II. Also, the Catfish Lake Restaurant is located within the southern CZ and occupies about three acres.

DPC Industries, Inc. manufactures and distributes water treatment chemicals, including chlorine. The parcel of land that the DPC Industries chlorine plant is located on is approximately 14.3 acres. The plant was built in 1996 and is located off of 25th Street near Gilmore Road in the City of Bellevue in the northeast corner of APZ II.

In the 1970s, the Air Force purchased an easement to control construction in the CZs, covering 3,000 square feet off of the runways, with the exception of three acres occupied by the Catfish Lake Restaurant. The restaurant is the only area of encroachment in the CZs and has existed since the first

AICUZ Report, published in 1976. The parcel of land that the restaurant is located on is approximately 22.6 acres and is located in the southeast CZ, shown in Figure 5.21-1.

The restaurant has not been required to shut down and close because it is protected by Section 5.29.08 of the City of Bellevue Zoning Ordinance, which allows the continuation of nonconforming uses. However, nonconforming uses are unable to be altered, enlarged, changed, or expanded in a way to increase its nonconformity. The restaurant is interested in expanding its operation, but it is not able due to the nonconforming use conditions within the CZ.

Existing Tools

Offutt AFB AICUZ Report

The AICUZ Report for Offutt AFB provides land use guidelines to prevent uses that can increase the potential for injuries associated with an accident in the APZs. Chemical and allied products manufacturing is not considered a compatible use in the APZ II. Following the material safety data sheet provided by DPC Industries, Inc., materials that are incompatible with chlorine includes hydrocarbons, which can be found in jet fuel. The high concentration of chlorine, combined with the accident risk in the area, makes the manufacturing plant an incompatible use.

The AICUZ Report for Offutt AFB provides land use guidelines for the land in the CZs. Because it is the area with the highest statistical probability for an accident to occur, no development should exist in the CZs. The AICUZ Report establishes that retail trade uses (eating and drinking establishments) are not compatible with the CZ due to the gathering of people in one area.

The AICUZ Report outlines land uses that are incompatible within the CZs and APZs. Table 5.14-1 in the Land Use Section is the table with all the recommended land uses for the CZs and APZs.

City of Bellevue Zoning Regulations

The chemical manufacturing plant is an incompatible use in APZ II. However, the plant still exists and is protected under Section 5.29.08, the Non-Conforming Uses regulation, which does not require removal or alteration of existing nonconforming uses. The regulation also prohibits any expansion, enlargement, or alteration of a nonconforming use that would increase its nonconformity. Any uses which become nuisances will not be entitled to continue as nonconforming uses. If the use is discontinued for 365 days, any future use must conform to the AICUZ Overlay District ordinance.

Additionally, if any nonconforming use or structure is destroyed, it shall not be reconstructed if the cost is more than sixty percent of the market value of the structure before the damage occurred. An exception to this regulation is if the structure is rebuilt in conformity with the provisions of the AICUZ Overlay District ordinance.

Findings

- The Offutt AFB AICUZ Report contains information about recommended land uses for safety zones that has since been updated in the DOD AICUZ program instructions.
- Chemical manufacturing, such as the DPC Industries chlorine plant, is not a compatible use within APZ II due to the hazardous chemicals; however the use is protected by the City of Bellevue's Non-Conforming Uses regulations.
- Existing nonconforming uses are exempt from the AICUZ regulations.
- The Air Force purchased an easement that prevents construction within the Clear Zone.
- Catfish Lake Restaurant is also exempt from Section 5.29 of the Bellevue Zoning Ordinance due to the non-conforming use regulations of the city. However, the AICUZ Ordinance does prohibit increasing the nonconformity.

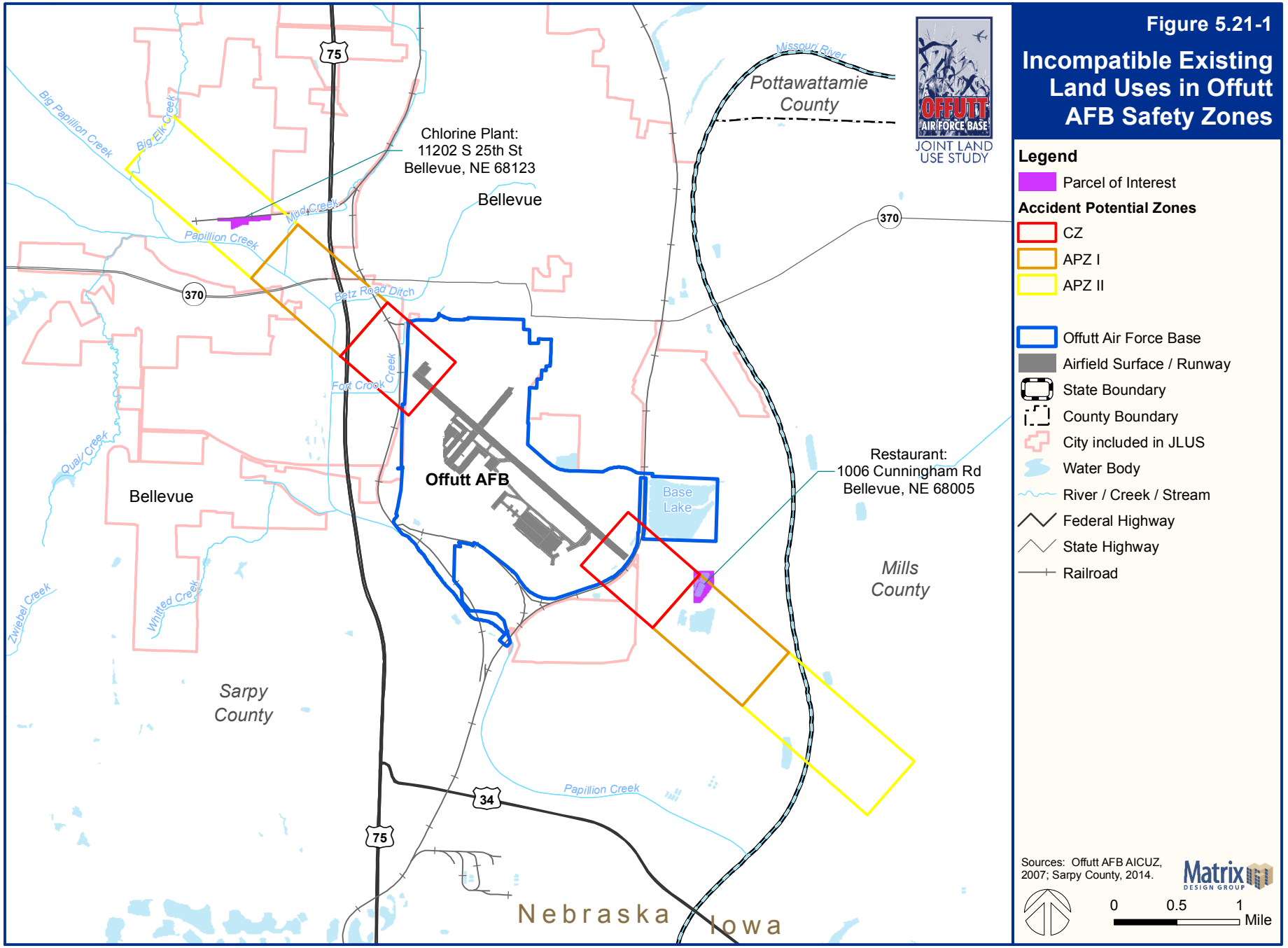


Figure 5.21-1
Incompatible Existing Land Uses in Offutt AFB Safety Zones
Legend
Parcel of Interest
Accident Potential Zones
CZ
APZ I
APZ II
Offutt Air Force Base
Airfield Surface / Runway
State Boundary
County Boundary
City included in JLUS
Water Body
River / Creek / Stream
Federal Highway
State Highway
Railroad
Chlorine Plant:
11202 S 25th St
Bellevue, NE 68123
Restaurant:
1006 Cunningham Rd
Bellevue, NE 68005
Offutt AFB
Bellevue
Bellevue
Pottawattamie County
Mills County
Sarpy County
Nebraska
Iowa
Missouri River
Big Papillion Creek
Big Elk Creek
Mud Creek
Papillion Creek
Betz Road Ditch
Ford Creek
Quail Creek
Zwiebel Creek
Whittted Creek
Base Lake
75
370
34
OFFUTT AIR FORCE BASE
JOINT LAND USE STUDY
Sources: Offutt AFB AICUZ, 2007; Sarpy County, 2014.
Matrix DESIGN GROUP
0 0.5 1 Mile

5.22 Scarce Natural Resources (SNR)

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

There were no issues identified for Scarce Natural Resources in this JLUS.

Please see the next page.

5.23 Vertical Obstructions (VO)

Vertical obstructions are created by buildings, trees, structures, or other features that may encroach into the navigable airspace or line of sight radar signal transmission pathways used by the military. These obstructions can be a safety hazard to both the public and military personnel and potentially impact military readiness.

Vertical obstructions can compromise the value of low-level flight training by limiting the areas where such training can occur. These obstructions can include a range of items from man-made, such as telephone poles, utility transmission towers, and radio antennas, to natural, such as tall trees and land features. Vertical obstructions can also interfere with radar transmissions, compromising the integrity of data transmission between the transmitter and receiver. Though most critical near the transmitter, the geographic area impacting the transmissions, or radar viewshed, can be broad depending on the distance between the transmitter and receivers.

Key Terms

Imaginary Surfaces. The term imaginary surface refers to the areas surrounding a heliport or airfield that must be kept clear of objects that might pose a safety threat to aviation activities. A man-made or natural object that projects above an imaginary surface is an obstruction.

Vertical Obstructions. Vertical obstructions are objects or structures that exceed a specified height above ground level and extend into airspace. Vertical obstructions may be created by buildings, trees, structures, or other features that are of greater height than, and encroach into, the navigable airspace used for military operations (aircraft approach-departure surfaces, transitional surfaces, as well as military training or flight routes). These can present a safety hazard to both the public and military personnel and potentially impact military readiness.

Technical Background

Vertical obstructions can compromise the value of low-level flight training by limiting the areas where such training can occur. These obstructions can include a range of items from man-made, such as telephone poles and radio antennae, to natural, such as tall trees and land features.

In relation to flight operations from an airport (military or civilian), vertical obstructions are addressed through compliance with Federal Regulation Title 14 Part 77, which establishes standards and notification requirements for objects affecting navigable airspace. Commonly referred to as Part 77 compliance, this regulation provides details to evaluate the potential for a vertical obstruction based on the elevation of the airfield, the height and resulting elevation of the new structure or facility, and the location of the structure or facility in relation to the airfield in question.

To determine when structures or facilities should be evaluated for vertical obstruction, Part 77 states the following requirements for notifying the FAA:

> *§77.9 - Any person/organization who intends to sponsor any of the following construction or alterations must notify the Administrator of the FAA:*
>
> *– Any construction or alteration exceeding 200 feet above ground level.*
>
> *Any construction or alteration:*
>
> *– within 20,000 feet of a public use or military airport which exceeds a 100:1 surface from any point on the runway of each airport with at least one runway more than 3,200 feet.*
>
> *– within 10,000 feet of a public use or military airport which exceeds a 50:1 surface from any point on the runway of each airport with its longest runway no more than 3,200 feet.*
>
> *– within 5,000 feet of a public use heliport which exceeds a 25:1 surface.*

Any highway, railroad, or other traverse way whose prescribed adjusted height would exceed the above noted standards.

When requested by the FAA:

– Any construction or alteration located on a public use airport or heliport regardless of height or location.

Part 77 also identifies the height at which an object may be considered an obstruction at a designated distance:

§77.17- Obstruction standards.

(a) An existing object, including a mobile object, is, and a future object would be an obstruction to air navigation if it is of greater height than any of the following heights or surfaces:

(1) A height of 499 feet above ground level at the site of the object.

(2) A height that is 200 feet above ground level or above the established airport elevation, whichever is higher, within three nautical miles of the established reference point of an airport, excluding heliports, with its longest runway more than 3,200 feet in actual length, and that height increases in the proportion of 100 feet for each additional nautical mile from the airport up to a maximum of 499 feet.

(3) A height within a terminal obstacle clearance area, including an initial approach segment, a departure area, and a circling approach area, which would result in the vertical distance between any point on the object and an established minimum instrument flight altitude within that area or segment to be less than the required obstacle clearance.

(4) A height within an en route obstacle clearance area, including turn and termination areas, of a Federal Airway or approved off-airway route, that would increase the minimum obstacle clearance altitude.

(5) The surface of a takeoff and landing area of an airport or any imaginary surface established under § 77.19, 77.21, or 77.23. However, no part of the takeoff or landing area itself will be considered an obstruction.

(b) Except for traverse ways on or near an airport with an operative ground traffic control service furnished by an airport traffic control tower or by the airport management and coordinated with the air traffic control service, the standards of paragraph (a) of this section apply to traverse ways used or to be used for the passage of mobile objects only after the heights of these traverse ways are increased by:

(1) 17 feet for an Interstate Highway that is part of the National System of Military and Interstate Highways where overcrossings are designed for a minimum of 17 feet vertical distance.

(2) 15 feet for any other public roadway.

(3) 10 feet or the height of the highest mobile object that would normally traverse the road, whichever is greater, for a private road.

(4) 23 feet for a railroad.

(5) For a waterway or any other traverse way not previously mentioned, an amount equal to the height of the highest mobile object that would normally traverse it.

Apart from the Part 77, the FAA has developed imaginary surfaces around runways to determine how structures and facilities are evaluated as to whether they pose a vertical obstruction relative to the surrounding airspace. The levels of imaginary surfaces build upon one another and are designed to eliminate obstructions to air navigation and operations, either natural or man-made. The dimension or size of an imaginary surface depends on the runway classification. Figure 5.23-1 illustrates all the imaginary surfaces of a runway and the heights and ratios that buildings and structures are evaluated for vertical obstructions.

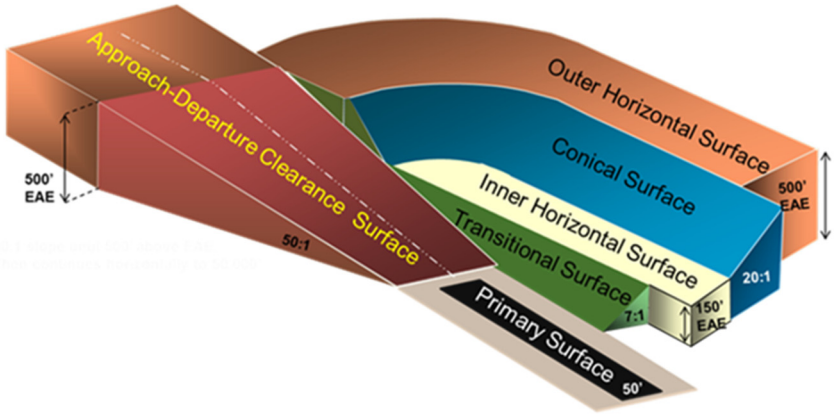


Figure 5.23-1 Example Imaginary Surfaces Cross-Section

As defined in the Offutt AFB AICUZ, the following provides a description of each of the imaginary surfaces.

Primary Surface. This surface defines the limits of the obstruction clearance requirements in the immediate vicinity of the landing area. The primary surface comprises surfaces of the runway, runway shoulders, and lateral safety zones and extends 200 feet beyond the runway end. The width of the primary surface for the type of runway at Offutt AFB is 2,000 feet, or 1,000 feet on each side of the runway centerline.

Clear Zone Surface. This surface defines the limits of the obstruction clearance requirements in the vicinity contiguous to the end of the primary surface. The length and width (for a single runway) of a Clear Zone surface at Offutt AFB is 3,000 feet by 3,000 feet.

Approach-Departure Clearance Surface. This surface is symmetrical about the runway centerline extended, begins as an inclined plane (glide angle) 200 at the end of the primary surface of the centerline elevation of the runway end, and extends for 50,000 feet. The slope of the approach-departure clearance surface is 50:1 along the extended runway (glide angle) centerline until it reaches an elevation of 500 feet above the established airfield elevation. It then continues horizontally at this elevation to a point 50,000 feet from the start of the glide angle. The width of this surface at the runway end is 2,000 feet; it flares uniformly, and the width at 50,000 feet is 16,000 feet.

Inner Horizontal Surface. This surface is a plane, oval in shape at a height of 150 feet above the established airfield elevation. It is constructed by scribing an arc with a radius of 7,500 feet above the centerline at the end of the runway and interconnecting these arcs with tangents.

Conical Surface. This is an inclined surface extending outward and upward from the outer periphery of the inner horizontal surface for a horizontal distance of 7,000 feet to a height of 500 feet above the established airfield elevation. The slope of the conical surface is 20:1.

Outer Horizontal Surface. This surface is a plane located 500 feet above the established airfield elevation. It extends for a horizontal distance of 30,000 feet from the outer periphery of the conical surface.

Transitional Surfaces. These surfaces connect the primary surfaces, Clear Zone surfaces, and approach-departure clearance surfaces to the outer horizontal surface, conical surface, other horizontal surface, or other transitional surfaces. The slope of the transitional surface is 7:1 outward and upward at right angles to the runway centerline. To determine the elevation for the beginning of the transitional surface slope at any point along the lateral boundary of the primary surface, including the CZ, draw a line from this point to the runway centerline. This line will be at right angles to the runway axis. The elevation at the runway centerline is the elevation for the beginning of the 7:1 slope.

ISSUE VO-1	**Height of nearby trees** Tree height obstructions are a concern for the air space operations at Offutt AFB.

Compatibility Assessment

The imaginary surfaces and Part 77 provide the guidance for evaluating vertical obstructions so that safe aviation operations can occur. The Burlington Northern Santa Fe Railroad runs from north of the base, from the City of Omaha, around the east side of the base and then continues south. The Union Pacific Railroad runs from north of the base, around the west side of the base and then continues south. The property owned by the railroad contains trees that are too tall for the area near the runway. Additionally, there are overgrown trees adjacent to the installation on the west side of the runway located on private property. Figure 5.23-2 illustrates the trees surrounding the airfield on the north and west sides that are too tall for this area relative to the imaginary surfaces of an airfield. These overgrown trees are located in the approach-departure zone at the northern edge of the airfield, which has a recommended height of a one foot vertical for every 50 feet horizontal. This northern area is also under the jurisdiction of the railroads and is subject to local regulations.

The overgrown trees on the west side of the airfield are located within the transitional surface, which has a slope of one foot vertical for every seven feet horizontal. This area is located within Sarpy County subject to the county's regulations for landscaping.

Google Street view, facing south, of trees along Fort Crook Road in the aircraft approach and departure zone (Offutt AFB is on the left side)

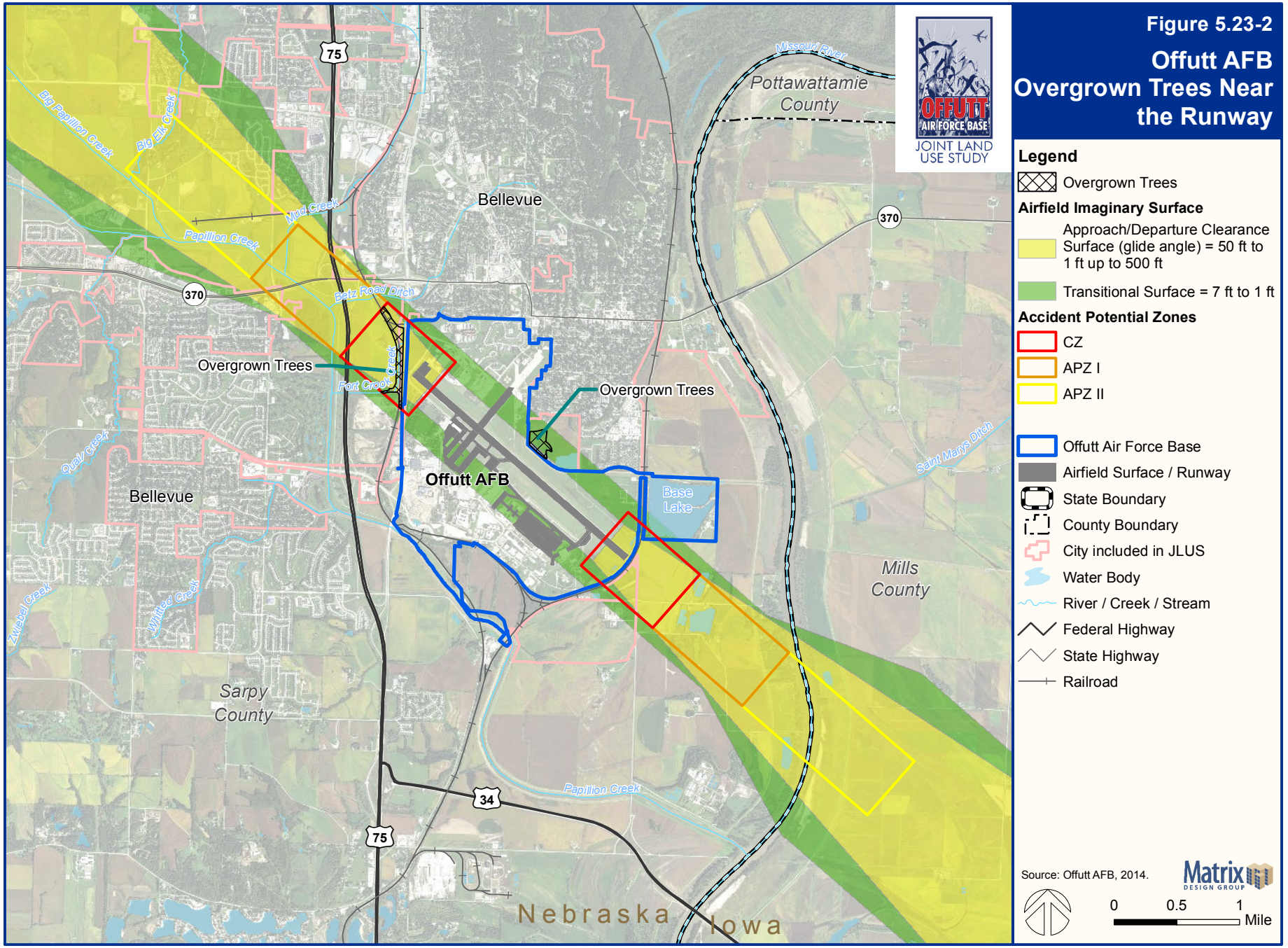


Figure 5.23-2
Offutt AFB
Overgrown Trees Near the Runway
OFFUTT AIR FORCE BASE
JOINT LAND USE STUDY
Legend
Overgrown Trees
Airfield Imaginary Surface
Approach/Departure Clearance Surface (glide angle) = 50 ft to 1 ft up to 500 ft
Transitional Surface = 7 ft to 1 ft
Accident Potential Zones
CZ
APZ I
APZ II
Offutt Air Force Base
Airfield Surface / Runway
State Boundary
County Boundary
City included in JLUS
Water Body
River / Creek / Stream
Federal Highway
State Highway
Railroad
Source: Offutt AFB, 2014.
Matrix DESIGN GROUP
0 0.5 1 Mile
Overgrown Trees
Overgrown Trees
Offutt AFB
Bellevue
Bellevue
Pottawattamie County
Sarpy County
Mills County
Nebraska
Iowa
Missouri River
Big Papillion Creek
Big Elk Creek
Mud Creek
Papillion Creek
Betz Road Ditch
Fort Crook Creek
Quail Creek
Zwiebel Creek
Whitted Creek
Saint Marys Ditch
Base Lake
Papillion Creek
75
370
370
34
75

Existing Tools

Sarpy County Zoning Regulations

Section 37.7 of the Sarpy County Zoning Regulations establishes the guidelines for landscape selection, installation, and maintenance requirements. Sections 37.7.3 and 37.74 regulations indicate that landscaping maintenance is required for the life of the development by the developer, its successor, improvement districts, and any owners, and that landscaping will be periodically inspected by the planning department.

The property on the west side of the airfield is currently zoned as, Federal Government Zone (FGZ), non-regulated as provided by the 2014 county data. However after review of Google Earth maps, there is a farm and structures relative to farming indicative of private property ownership. If this property is truly private property, then the owner is responsible for the maintenance of the trees as per the Sarpy County Zoning Regulations Section 37.7.3. However, the zoning regulations do not define appropriate tree heights for areas immediately around the runway.

In addition, Sarpy County does not incorporate the imaginary surfaces and their slopes on its zoning map or the property search map and its information, which can make it more difficult for owners and applicants to determine if there is a vertical obstruction on their property near the airfield.

Moreover after review of Sarpy County's Property Search Map located at http://maps.sarpy.com/propertyrecords/#IE, the county's website indicates this area west of the airfield is zoned as Agriculture (AG) with the zoning jurisdiction listed as City of Bellevue. This is inconsistent with the jurisdictional boundary data provided by the City of Bellevue. The City of Bellevue boundary does not include this property west of the airfield.

City of Bellevue Zoning Regulations

Although this property is not identified as the city's jurisdiction from the data provided for this study, if the city annexes this area in the future, then Section 5.29 of the Bellevue Zoning Ordinance establishes an AICUZ Overlay District that regulates height and obstruction. This Overlay District incorporates both FAA Part 77 and the imaginary surfaces guidelines for evaluating vertical obstructions by definition to include the slopes of the various imaginary surfaces. This regulation is a good example of military compatibility planning; however, the regulation does not indicate if it applies to natural-made structures such as trees.

Findings

- Sarpy County Zoning Regulations for landscaping do not address regulations for tree maintenance or identify maximum allowable heights for trees near the airfield.
- Inconsistency in jurisdictional zoning information for the property west of airfield.
- Natural-made structures such as trees create vertical obstructions for aviation operations if located in areas immediately adjacent to airfields.
- The trees/land uses located in the railroad corridor are not subject to local jurisdictional regulations.

ISSUE VO-2	**Height of future development** Lands within the airfield imaginary surfaces have the potential for development that is taller than the recommended heights and may be incompatible.

Compatibility Assessment

Airfield protection addresses obstructions in proximity to the airfields and applies to the height of all vertical structures that may pose a safety risk to pilots and aircraft. Vertical structures within these areas can create hazards to avigation. Since these areas may include property outside the installation perimeter, regulations or land acquisition may be employed to protect areas surrounding an airfield.

Communities regulate height in various ways, including through conventional zoning absent any reference to FAA Part 77 or "imaginary surfaces." Others use conventional zoning, but incorporate Part 77 or imaginary surfaces by reference, or in more explicit terms. These various methods can and do result in different outcomes, some of which create vertical obstructions in violation of imaginary surface and/or Part 77 standards. These obstructions impact military operations by creating safety and operational hazards.

Although these regulations are currently in effect for some jurisdictions, there is some concern that developers may not be aware of the regulations, particularly those outside the city limits. They may propose plans for a structure or use, such as a communications tower, that would infringe upon one or more imaginary surfaces. Such a proposal would most likely be detected during review by City staff, but it would also be important to ensure the City staff are properly trained in how to determine when a structure is a vertical obstruction.

Rural land uses also pose a problem. Energy production facilities or agricultural buildings, such as silos, can create vertical obstruction. This issue addresses the various Study Area jurisdictions and the existing tools they use to regulate height.

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

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

Existing Tools

Federal Aviation Regulations Part 77

Federal Aviation Regulations Part 77, Subpart C stipulates height restrictions conforming to an established imaginary surface to prevent obstructions from affecting navigable airspace. Section 77.17 identifies the height at which an object may be considered an obstruction at a designated distance. Additional details on Section 77.17 can be found in Chapter 4 under Federal Aviation Act.

FAA Obstruction Evaluation

The FAA's Obstruction Evaluation tool is an online resource that anyone can access. It allows the user to search for vertical obstruction locations that have been identified around an airport or location. The website for this tool is:
https://oeaaa.faa.gov/oeaaa/external/searchAction.jsp?action=showCircleSearchForm.

City of Bellevue Zoning Ordinance

In Section 5.29 for the AICUZ Overlay District, land use restrictions for the Area with Height and Obstruction Criteria, prevents any uses that may cause obstruction to air navigation, including:

> *A. Natural objects or man-made structures that protrude above the planes or surfaces as defined in the following paragraphs; and/or*
> *B. Man-made objects that extend more than 500 feet above the ground at the site of the structure.*

FAA Part 77 requires developers to notice the FAA of any projects over 200 feet tall or within the vicinity of airports to ensure that the buildings will not be a hazard to air navigation. The FAA has no land use powers, so it can only encourage local jurisdictions to oppose any development that would create a hazard to air navigation. The City of Bellevue requires all proposed development to comply with the height restriction criteria of FAA Part 77.

Sarpy County Zoning Ordinance

Sarpy County's Airport Approach Zone District was established in order to restrict land uses within airfield and/or airport approach zones. Structures within the district are to meet both federal and state airport approach regulations.

Findings

- The Sarpy County Zoning Ordinance does not state height requirements for the Airport District.

5.24 Vibration (V)

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

There were no issues identified for Vibration in this JLUS.

Please see the next page.

5.25 Water Quality / Quantity (WQQ)

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

Key Terms

Groundwater. Groundwater is water held underground in the soil or in pores and crevices in rock.

Point-Source Pollution. This term refers to water pollution that comes from a single, discrete place, such as a factory drainage pipe.

Wetlands. Wetlands are areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support a prevalence of vegetation typically adapted for life in saturated soil conditions. Jurisdictional wetlands are those that are regulated by the US Army Corps of Engineers under Section 404 of the Clean Water Act.

ISSUE WQQ-1	**Missouri River management in the Upper Basin** Entities that are responsible for managing the Upper Basin of the Missouri River and releasing water from dams upriver should coordinate with Offutt AFB and local jurisdictions to minimize flooding concerns.

Compatibility Assessment

The US Army Corps of Engineers controls the release of water into the Missouri River from Gavins Point Dam near the City of Yankton, along the South Dakota / Nebraska border. To reduce the risk of flooding, there is reduced release when heavy rains occur in the Missouri River Basin. The reservoirs at the dam are well equipped to handle stored excess water and can hold up to 16.3 million acre-feet of water. When water release is reduced in the summer, excess water is then released in the fall to prepare for the collection of next year's runoff. When water release is raised, the Army Corps carefully monitors downstream conditions in Sioux City, Iowa. However, there is little coordination with Offutt AFB and the surrounding jurisdictions to prevent flooding further down river.

Existing Tools

Integrated Natural Resources Management Plan

The Army Corps of Engineers has constructed levies which have almost eliminated the threat of base flooding. However, much of the base is located within a floodplain, making it susceptible to the risk of flooding. Floodplain goals are included in the Integrated Natural Resources Management Plan to prevent flooding. One of the goals is to maintain floodplain assessment and mapping to better protect floodplains and prevent flooding.

Findings

- The release of water from Gavins Point Dam impacts river levels that could potentially create flooding nearby Offutt AFB.
- Water released from Gavins Point Dam is coordinated downriver with Sioux City, Iowa, yet there is no coordination with Offutt AFB or the surrounding jurisdictions.

Please see the next page.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