

MAY 2016

Joint Land Use Study Report



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





ELLSWORTH AIR FORCE BASE JOINT LAND USE STUDY

Prepared Under Contract With:

South Dakota
Ellsworth Development Authority

South Dakota Ellsworth Development Authority
14 St. Joseph Street, Suite 200
Rapid City, SD 57709

Prepared By:

Matrix 
DESIGN GROUP

May 2016

This study was prepared under contract with the South Dakota Ellsworth Development Authority (SDEDA), 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.



Acknowledgements

Executive Committee

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

- **Steve Allender**, *Mayor*
City of Rapid City
- **Col Boswell**, *Commander*
Ellsworth Air Force Base
- **Robert Heidgerken**, *Commissioner*
Meade County
- **Scott Landguth**, *Executive Director*
South Dakota Ellsworth Development Authority
- **Larry Larson**, *Mayor*
City of Box Elder
- **Nancy Trautman**, *Commissioner*
Pennington County

Working Group

The Working Group (WG) served an active and important role in providing policy direction during the development of Ellsworth Air Force Base (AFB) Joint Land Use Study (JLUS). The Working Group comprised of the following individuals:

- **PJ Conover**, *Planner*
Pennington County
- **Linda Fry**, *Planner*
Ellsworth Air Force Base
- **Kip Harrington**, *Planner*
City of Rapid City
- **Glen Kane**, *Managing Director*
South Dakota Ellsworth Development Authority
- **Ron Koan**, *Planner*
City of Box Elder
- **Bill Rich**, *Planner*
Meade County

South Dakota Ellsworth Development Authority

The South Dakota Ellsworth Development Authority (SDEDA) served as the overall JLUS project management agency and the administrator of the Office of Economic Adjustment grant that helped to fund the study.



- **Glen Kane**
Managing Director
- **David Kneafsey**
Operations Manager
- **Scott Landguth**
Executive Director

JLUS Consultant

Matrix Design Group, Inc. was the project consultant hired to conduct the JLUS project through coordination with and assistance from SDEDA, the EC, WG, the public, and other stakeholders.



- **Rick Rust, AICP, GISP**
Project Manager
- **Mike Hrapla**
Military Liaison
- **Celeste Werner, AICP**
Deputy Project Manager
- **Felipe Zubia, AICP**
Lead Planner



Table of Contents

Acronyms.....	V
1. Introduction.....	1
What Is a Joint Land Use Study?	2
JLUS Goal and Objectives	2
Why Prepare a Joint Land Use Study?	3
Public and Stakeholder Outreach	3
Public Participation	4
Public Outreach Materials	4
JLUS Study Area	5
2. Community Profiles	7
Study Area Growth Trends	7
3. Military Profile.....	11
Installation Setting.....	11
Current Mission Operations	12
Ellsworth AFB Mission Footprint.....	12
4. Compatibility Tools	23
Federal Programs and Policies	23
Ellsworth AFB Plans and Programs	25
State of South Dakota	25
Local Jurisdiction Planning Tools	26
Pennington County	26
Meade County	27
City of Box Elder	28

5.	Compatibility Assessment	31
	Identification of Compatibility Issues	31
	Methodology and Evaluation	31
	Organization of the Issues.....	32
	Major Issues	32
	Other Issues	36
6.	Implementation Plan	39
	Implementation Plan	39
	Implementation Plan Guidelines	40
	Military Compatibility Areas	40
	How to Read the Implementation Plan	46
	Issues / Strategies by Compatibility Factor	48

Figures

Figure 1	2014 Ellsworth AFB Economic Impact	3
Figure 2	JLUS Study Area	6
Figure 3	Mission Footprint: Flight Patterns.....	13
Figure 4	Mission Footprint: Imaginary Surfaces	15
Figure 5	Mission Footprint: Accident Potential Zones.....	16
Figure 6	Mission Footprint: Noise Contours.....	17
Figure 7	Airspace Control	19
Figure 8	Mission Footprint: Part 77	20
Figure 9	Mission Footprint: BASH Relevancy Area	21
Figure 10	Ellsworth AFB Study Area MCA	41

Figure 11	Ellsworth AFB Noise Military Compatibility Area.....	42
Figure 12	Ellsworth AFB Safety Military Compatibility Areas.....	43
Figure 13	Ellsworth AFB Imaginary Surfaces Military Compatibility Area	44
Figure 14	How to Read JLUS Strategies.....	47

Tables

Table 1	Population Growth From 2000 to 2010	7
Table 2	Meade and Pennington Counties Population Projections from 2010 to 2035 in Five-Year Intervals.....	8

Please see the next page.



Acronyms

A

AAB	Army Air Base
ACC	Air Combat Command
AFB	Air Force Base
AFI	Air Force Instruction
AGL	Above Ground Level
AICUZ	Air Installation Compatible Use Zone
AOA	Area Operations Area
API	American Petroleum Institute
APZ	Accident Potential Zone
APZ I	Accident Potential Zone I
APZ II	Accident Potential Zone II
AQ	Air Quality
AQCR	Air Quality Control Regions
AT	Anti-Terrorism / Force Protection
ATC	Air traffic control

B

BAH	Basic Allowance for Housing
BASH	Bird / Wildlife Aircraft Strike Hazard
BHWG	Bird Hazard Warning Group
BIO	Biological Resources
BOD	Biochemical Oxygen Demand
BRAC	Base Realignment and Closure
BW	Bomb Wing

C

CA	Climate Adaptation
CAA	Clean Air Act
CC	Community Commercial
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act of 1980
CFR	Code of Federal Regulations
CO	Carbon Monoxide
COM	Coordination / Communication
CP	Canadian Pacific
CR	Cultural Resources
CWA	Clean Water Act
CZ	Clear Zone

D

dB	Decibel
dBA	A-Weighted Decibel
DM&E	Dakota, Minnesota, and Eastern Railroad
DNL	Day-Night Sound Level
DOD	United States Department of Defense
DSS	Dust / Smoke / Steam

E

EA	Environmental Assessment
EAFB	Ellsworth Air Force Base
EC	Executive Committee
ED	Energy Development
EIS	Environmental Impact Statement
EOD	Explosive Ordnance Disposal
EMS	Emergency Medical Services
EPA	Environmental Protection Agency
ESA	Federal Endangered Species Act

F

FAA	Federal Aviation Administration
FCC	Federal Communications Commission
FLPMA	Federal Land Management and Policy Act
FONSI	Finding of No Significant Impact
FSI	Frequency Spectrum Impedance / Interference

G

GC	General Commercial
GI	General Industrial
GO	General Office
G&W	Genesee & Wyoming, Inc.

H

HA	Housing Availability
HCP	Habitat Conservation Plan
HI	Heavy Industrial
HQ SAC	Headquarters Strategic Air Command
HUD	United States Department of Housing and Urban Development

I

I-90	Interstate 90
IB	Intercontinental Ballistic
IC&E	Iowa, Chicago & Eastern Railroad
ICBM	Intercontinental Ballistic Missile
ICEMAP	Installation Complex Encroachment Management Action Plan
ICRMP	Integrated Cultural Resources Management Plan
IE	Infrastructure Extensions
INRMP	Integrated Natural Resources Management Plan
IRT	In-Place Reductive Treatment

J

JLUS	Joint Land Use Study
------	----------------------

L

LAS	Land / Air / Sea Spaces
LEG	Legislative Initiatives
LG	Light and Glare
LMI	Logistics Management Institute
LOS	Level of Services
LU	Land Use
LWES	Large Wind Energy System

M

MAR	Marine Environments
MFWE	Moving Forward with Ellsworth Air Force Base
MHPI	Military Housing Privatization Initiative
MILCON	Military Construction
MPO	Metropolitan Planning Organization
MSA	Metropolitan statistical area
MSL	Mean sea level

N

NACo	National Association of Counties
NAAQS	National Ambient Air Quality Standards
NBD	Neighborhood Business District
NEAP	Natural Event Action Plan
NEPA	National Environmental Policy Act
NGO	Non-Governmental Organization
NHPA	National Historic Preservation Act
NLR	Noise Level Reduction
NO2	Nitrogen Dioxide
NOAA	National Oceanic and Atmospheric Administration

NOI	Noise
NPDES	National Pollutant Discharge Elimination System
NPL	National Priorities List

O

O3	Ozone
OEA	Office of Economic Adjustment
OSB	Oriented Strand Board
OSI	Air Force Office of Special Investigations
OSS	Operations Support Squadron
OU	Operable Units

P

PLSS	Public Land Survey System
PM	Particulate Matter
PM2.5	Fine Particle
PM10	Course Particle
Prime BEEF	Prime Base Engineer Emergency Force
PRTC	Powder River Training Complex
PT	Public Transportation

R

R8	High-Density Multiple-Family Residential Radar
RAPCON	approach control
RC	Roadway Capacity
RCPE	Rapid City, Pierre & Eastern Railroad Recovery Credit
RCS	System
REPI	Readiness Environmental Protection Integration

RF Radio Frequency
 RWWTP Regional Wastewater Treatment Plant

S

S1 Support staff functions
 S2 Ground intelligence and investigations
 S3 Operations and training
 S4 Logistics
 S5 Plans and programs
 SD 44 South Dakota Highway 44
 SA Safety Zones
 SD South Dakota
 SDDENR South Dakota Department of Environment and Natural Resources
 SDDOT South Dakota Department of Roads
 SDEDA South Dakota Ellsworth Development Authority
 SDSU South Dakota State University
 SDWA Safe Drinking Water Act
 SIC Standard Industrial Classification
 SIP State Implementation Plan
 SNR Scarce Natural Resources
 SO2 Sulfur Dioxide
 START Strategic Arms Reduction Treaty
 SWPPP Storm Water Pollution Prevention Plan

T

TBD To Be Determined

U

UAV Unmanned Aerial Vehicle
 UFC Unified Facilities Criteria
 UH Unaccompanied Housing
 US United States
 USAF United States Air Force
 USAHAS United States Avian Hazard Advisory System
 USFWS United States Fish and Wildlife Service

V

V Vibration
 VA Veterans Affairs
 VFR Visual Flight Rules
 VO Vertical Obstructions

W

WF South Dakota Wildland Fire Suppression Division
 WG Working Group
 WQQ Water Quality / Quantity
 WWII World War II
 WWTTP Wastewater treatment plant

1-999

28 SFS	28 th Security Forces Squadron
28 th BW	28 th Bomb Wing
28 th OG	28 th Operations Group
37 th BS	37 th Bomb Squadron
432 nd ATKS	432 nd Attack Squadron

Please see the next page.



Introduction



The Ellsworth Force Base (AFB) Joint Land Use Study (JLUS) is a collaborative planning effort between the communities in South Dakota around Ellsworth AFB. In South Dakota, these communities are the cities of Box Elder and Rapid City, as well as Meade County and Pennington County. An organized communication effort between these jurisdictions, Ellsworth AFB, and other stakeholder entities that own or manage land or resources in the region is needed to ensure that future growth around Ellsworth AFB is coordinated and compatible with military training activities.

The Ellsworth AFB JLUS advocates a proactive approach to encourage increased communication about decisions relating to land use regulation, conservation, and natural resource management issues affecting both the community and the military. This study seeks to avoid conflicts previously experienced between the United States (US) military and local communities in other areas of the US and throughout the world by engaging the military and local decision-makers in a collaborative planning process. The intent of the process is to establish and encourage a working relationship among military installations and their proximate communities to act as a team to prevent and/or reduce encroachment issues associated with current and future missions and local growth.

The term encroachment refers to conflicting uses of land, air, water, and other resources that may individually or cumulatively impact the military's ability to carry out its training missions. The compatibility factors considered in this JLUS are described in the Compatibility Assessment (Chapter 5 of the JLUS Report or Background Report). A set of strategies to address compatibility concerns was developed upon review of these factors and identification of issues with the communities, Ellsworth AFB, JLUS committees, and the public. The recommended strategies are based on a toolbox of methods used to address compatibility issues and address the use of policy, planning and zoning, coordination and communication, and outreach methods. One of the key recommendations is the formation of a JLUS Coordination Committee responsible for overseeing the implementation progress in the months and years after the JLUS is completed. The recommended strategies are outlined in more detail in Chapter 6, Implementation Plan.

What Is a Joint Land Use Study?

A JLUS is a planning process accomplished through the collaborative efforts of stakeholders in a defined study area to identify compatible land uses and growth management guidelines within, and adjacent to, an active military installation. These stakeholders include local, state, and federal officials, residents, business owners, non-governmental organizations, and the military. The process is intended to establish and encourage a working relationship among military installations and proximate communities to prevent and / or reduce encroachment issues associated with future mission changes and local growth. Although primarily funded through a grant provided by the Department of Defense (DOD) Office of Economic Adjustment (OEA), a JLUS is produced by and for local communities. The local project management entity for the Ellsworth AFB JLUS is the South Dakota Ellsworth Development Authority, which was established in 2009.



JLUS Goal and Objectives

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

To achieve this goal, three primary JLUS objectives were identified.

- **Understanding.** Convene community and military representatives to identify, confirm, and understand compatibility issues and concerns in an open forum, considering both the community and military perspectives and needs. This includes increasing public awareness, education, and opportunities for input organized in a cohesive outreach program.
- **Collaboration.** Encourage cooperative land use and resource planning among Ellsworth AFB and surrounding communities so that future community growth and development are compatible with the Ellsworth AFB missions and operations, while seeking ways to reduce operational impacts on land within the study area.
- **Actions.** Provide a set of mutually supported tools, activities, and procedures from which local jurisdictions, agencies, and Ellsworth AFB can select, prepare, and approve / adopt in order to implement recommendations developed during the JLUS process. The actions include both operational measures to mitigate installation impacts on surrounding communities and local government and agency approaches to reduce community impacts on military operations. These tools help decision makers resolve compatibility issues and prioritize projects within their annual budgeting.

Why Prepare a Joint Land Use Study?

Collaboration and joint planning among military installations, local jurisdictions, and agencies protects the long-term viability of existing and future military missions. Working together also enhances local economies and industries by preventing incompatibilities. Recognizing the importance of a close relationship by an installation and its surrounding communities, the OEA implemented the JLUS program to improve military and civilian relationships through communication and to mitigate existing and future conflicts. Fostering healthy relationships between military installations and their surround communities can help all parties co-exist and live in harmony.

Economic Importance

Ellsworth AFB is a significant economic engine in western South Dakota. As the largest employer in the Black Hills area, creating approximately 1,147 civilian jobs, the installation has an estimated total economic value totaling approximately \$300 million in 2015 (*Ellsworth Air Force Base, 2015 Economic Impact Statement*). Ellsworth also leases an underutilized facility on the base to Advance Health, who uses the office space as a call center. Figure 1 illustrates the total impact separated into typical economic impact categories.

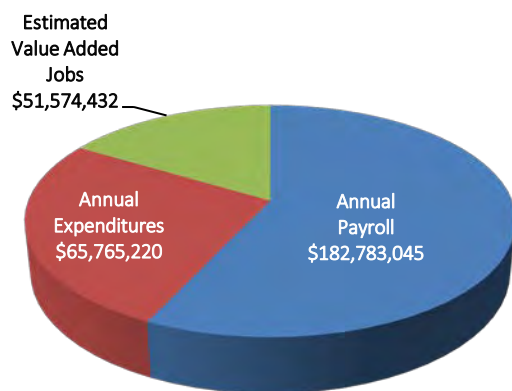


Figure 1. 2014 Ellsworth AFB Economic Impact

Source: *Ellsworth Air Force Base Economic Impact Statement, Fiscal Year 2014*

A Part of the Local Community

In addition to the economic benefits Ellsworth AFB provides to the region, the installation is involved with a variety of community outreach and educational programs. Military personnel stationed at Ellsworth AFB have become an integrated part of the surrounding communities' way of life. Some of the actions taken by Ellsworth AFB include educational seminars at local schools, air shows, and various other events. These are hosted by the installation, and staff volunteering with scout groups, churches, veteran organizations and other non-profit organizations in the area. Ellsworth also plays an important role in supporting the large population of retired military personnel in the neighboring communities.

Military Strategic Importance

Ellsworth AFB is not only important to the local community, through its economic impact and community engagement, but also nationally with the capabilities of the Ellsworth AFB 28th Bomb Wing (28th BW) mission supporting the country's interests around the world.

The 28th BW provides unparalleled expert training of bomber aircrews, which provides the country with superb power and global reach. This is possible by the virtually unencroached airspace for which the bomber crews can train and the sparsely populated geography. This installation's mission and assets, including the Powder River Training Complex, enable the US Air Force to maintain its superiority in putting bombs on target.

Public and Stakeholder Outreach

As highlighted previously, the JLUS process is designed to create a locally relevant study that builds consensus and obtains support from the stakeholders involved. The Ellsworth 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 the planning process is stakeholder identification. Informing and involving stakeholders early in the JLUS process is instrumental to identifying, understanding, and resolving important issues through the development of integrated strategies and measures. Stakeholders include individual residents, businesses, landowners, groups, organizations, and governmental entities interested in, affected by, or affecting the outcome of the JLUS document.

Executive Committee and Working Group

The development of the Ellsworth AFB JLUS was guided by two committees, the Executive Committee (EC) and the Working Group (WG). These committees included staff from SDEDA, the affected cities and counties, Ellsworth AFB, federal and state agencies, resource agencies, and local governments. A description of the two committees is provided below.

- **JLUS Executive Committee (EC).** The EC consisted of officials from participating jurisdictions and military installation leadership. The EC was responsible for the overall direction of the JLUS, including approval of the study design, strategy and tool recommendations, and draft and final JLUS documents.
- **JLUS Working Group (WG).** The WG was responsible for providing technical expertise, feedback, and suggestions to the JLUS team. The WG identified and addressed technical issues, provided feedback on report development, and assisted in the development and evaluation of implementation strategies and tools. The WG provided recommendations to the EC.

Public Participation

In addition to the EC and WG 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 issues to be addressed, and provided an opportunity for input on 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 JLUS development. The public workshops were conducted as follows.

Public Outreach Materials



JLUS Overview Fact Sheet. At the beginning of the JLUS process, a Fact Sheet was developed to describe the JLUS program, objectives, methods for public input, and proposed the Ellsworth AFB JLUS study area. This Fact Sheet was made available at the meetings and on the project website for review by interested members of the public and for download.

Strategy Tools Brochure. JLUS strategies incorporate a variety of actions that local governments, military installations, agencies, and other stakeholders can take to promote compatible land use planning. This brochure provided an overview of strategy types that can be applied to address study area compatibility issues.

Website. A project website was developed to provide stakeholders, the public, and media representatives with access to project information. The website was maintained for the entire duration of the project to make information easily accessible. Information contained on the website included program points of contact, schedules, relevant documents and maps, public meeting information, and downloadable comment forms. The project website is located at www.ellsworthjlus.com.



The JLUS Study Area does not include the Powder River Training Complex or any other Military Operations Areas or Military Training Routes outside of Meade and Pennington Counties.

JLUS Study Area

The Ellsworth AFB JLUS Study Area is designed to encompass all lands near the base that may impact current or future military operations or be impacted by operations. In total, the JLUS Study Area encompasses approximately 500 square miles that include portions of Meade County and Pennington County. The cities outside of the JLUS Study Area are characterized as rural with agricultural and ranching land uses featuring large areas designated to forests and open spaces.

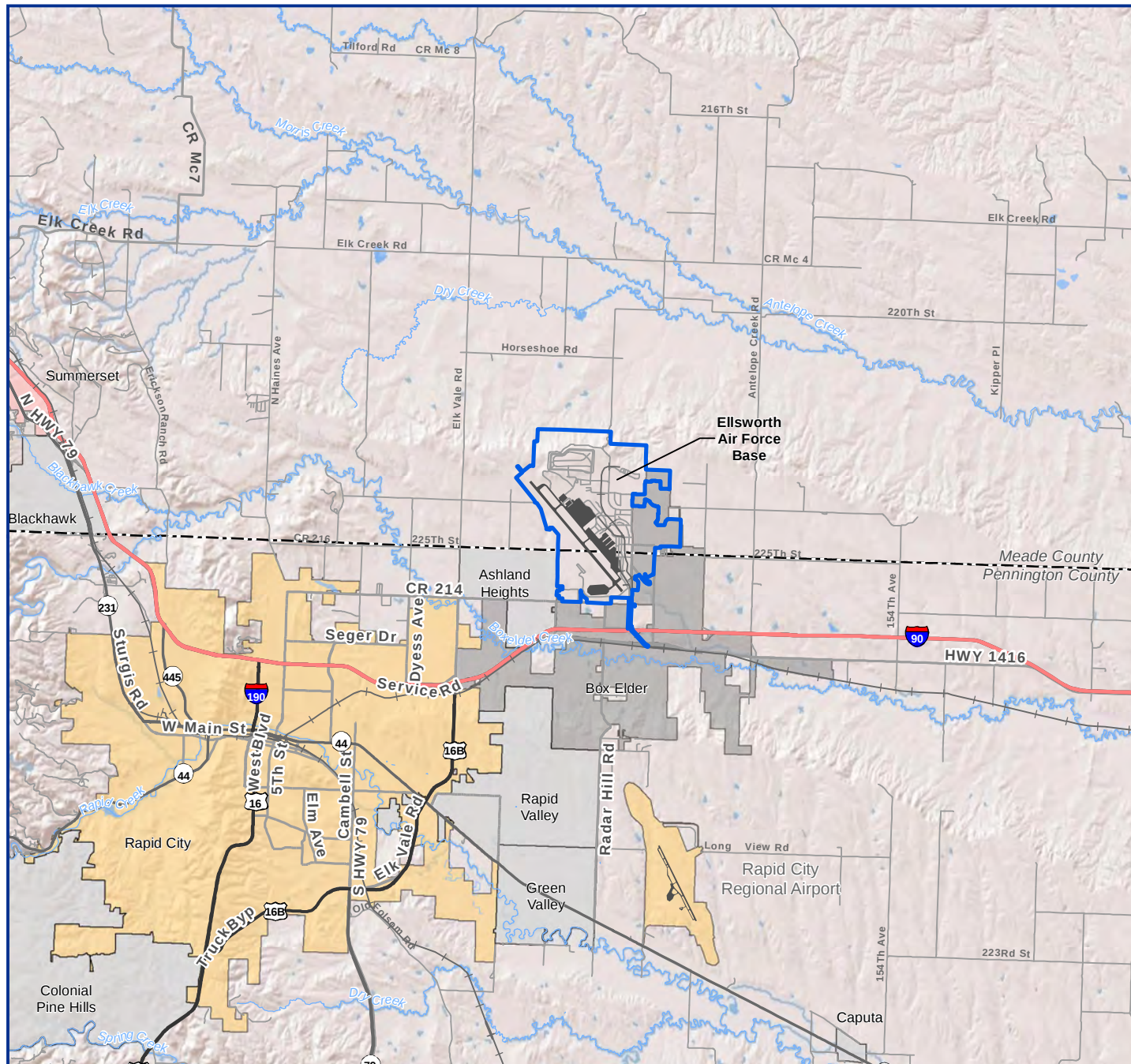
The primary characteristics evaluated in determining the JLUS Study Area was general compatibility factors associated with military mission readiness and land uses that may impact or be impacted by military operations. Figure 2 illustrates the extent of the JLUS Study Area.

Figure 2

JLUS Study Area

Legend

-  Ellsworth Air Force Base
-  County Boundary
-  Rapid City
-  Box Elder
-  Incorporated Community
-  Other Unincorporated Community
-  Water Body
-  River
-  Interstate
-  Federal Highway
-  State Highway
-  Major Roads
-  Local Traffic
-  Railroad
-  Airfield Surface / Runway



Source: TIGER, 2015,
Matrix Design Group, 2015,
Ellsworth Air Force Base, 2015.



0 1 2
Miles



Community Profiles 2

The study area for the Ellsworth AFB JLUS is centered around Ellsworth AFB and includes several communities around Ellsworth AFB, in South Dakota. These communities are: the cities of Box Elder and Rapid City, as well as Meade County and Pennington County. An overview of the JLUS study area communities is discussed to provide a look at the civilian side and the partners who participated in the JLUS.

Study Area Growth Trends

It is important to examine past, current, and future growth trends to understand the types and amount of growth and development occurring in the Study Area. Identifying growth patterns for the area surrounding Ellsworth AFB is one part in determining potential future compatibility issues or areas of concern associated with where new growth may extend that could impact or be impacted by military operations. This section assesses the recent and projected future population changes within the JLUS Study Area, as well as housing and economic trends that could be indicators of future growth.

Population Trends

Population data for South Dakota, its counties, and incorporated communities is based on a combination of information provided by the US Census Bureau and the South Dakota State University (SDSU) Rural Life and Census Data Center. The SDSU Data Center performs statewide demographic work and is informed by a state-wide advisory committee.

Table 1. Population Growth From 2000 to 2010

Location	2000	2010	Percent Change 2000 to 2010
State of South Dakota	754,844	814,180	7.9%
Meade County	24,253	25,434	4.9%
Box Elder (Part)	--	2,706	
Pennington County	88,565	100,948	14.0%
Box Elder (Part)	2,841	5,094	79.3%
Rapid City	61,167	67,956	11.10%

Source: US Census Bureau, 2000 and 2010

Table 1 shows the population change for the State of South Dakota, and the applicable county and municipal jurisdictions from 2000 to 2010. During this time, Pennington County had a population growth rate of 14 percent. Meade County experienced a growth rate of 4.9 percent during this period. Today, Meade County continues its steady growth at 4.4 percent. According to a 2014 report, this rate ranks Meade County as one of the top 10 fastest growing counties in the country. Source: *Rapid City Journal*, March 28, 2014.

In total, the majority of counties in South Dakota experienced a decline between the years 2000 and 2010. The net effect resulted in a growth rate of approximately 7.9 percent for the state.

Pennington County and Rapid City had a growth rate of over 10 percent. Meade County saw a minimal rate of change in population between 2000 and 2010. Compared to other jurisdictions in the Study Area, the rate of change for the City of Box Elder at 79.3 percent is almost seven times more than Rapid City and Pennington Counties. The increase in Box Elder's

population is primarily attributable to the annexation of Ellsworth AFB housing area and the fact that the base population was smaller before this change.

Population Projections

It is also important to assess projected population changes. The SDSU Rural Life and Census Data Center has compiled preliminary population projections for South Dakota and its counties, as shown in Table 2. The SDSU's projections are somewhat independent of the US Census data, making the numbers vary slightly.

Between the years of 2010 and 2035, the state's total population is projected to grow by 20 percent. Meade County is projected to have a slightly lower percent in population, with an increase of approximately 13 percent from 2010 to 2035. As the center of population and amenities for the MSA, Pennington County is expected to have a higher growth rate than the state at 29 percent.

Although the population for the State of South Dakota is increasing, the population will increase at a decreasing rate throughout the next 20 years (Rural Life and Census Data Center, South Dakota State University). Meade County and Pennington County are two counties that support this trend with a decrease in population growth rates from 2000 to 2010 compared to 2025 to 2035. The growth rate for Meade County was 4.9 percent from 2000 to 2010, but from 2025 to 2035, the growth rate is projected to be 3.5 percent. In Pennington County, the growth rate from 2000 to 2010 was 14 percent, but from 2025 to 2035, it is projected to be 8.7 percent.

Table 2. Meade and Pennington Counties Population Projections from 2010 to 2035 in Five-Year Intervals

Location	2010	2015	2020	2025	2030	2035
State of South Dakota	814,180	852,624	889,447	922,748	951,885	977,574
Meade County	25,434	26,407	27,195	27,805	28,317	28,776
Pennington County	100,948	107,845	114,161	119,876	125,154	130,256

Sources: Rural Life and Census Data Center, South Dakota State University
South Dakota Labor Market Information Center

Economic Development

For purposes of looking at the regional economy, data is often reported for an area called the Rapid City Metropolitan Statistical Area (MSA). An MSA is defined, in general as a "geographical region with a relatively high population density at its core and close economic ties throughout the area". The Rapid City MSA is defined to include all of Meade, Pennington and Custer Counties.

Source: U.S. Office of Management and Budget.

While there is a diverse economy in this area, much of the non-farm employment in the Rapid City MSA is in the following industries:

- Trade / Transportation / Utilities,
- Government Services,
- Educational / Health Services, and
- Leisure / Hospitality.

The Rapid City MSA serves as an employment and commercial hub for the western portion of South Dakota. While service jobs are a key contributor to the region's economy, a variety of high quality and diverse employment opportunities exist.

The majority of employment in the region is the service sector, including healthcare, education, and hospitality. This sector has continued to grow steadily and is expecting continued growth into the future, making this sector the principal sector in the Rapid City MSA. In 2014, there were approximately 58,700 service sector jobs in the MSA, which was a 5.6 percent increase from 2010. From 2000 to 2010, this sector grew by 13.7 percent, while the overall goods producing sector declined by 21.3 percent.

In the Rapid City MSA, the downward trend of the goods producing sector was evident between 2000 and 2010 when the manufacturing industries saw a significant decline of 47.5 percent. Since 2010, the manufacturing industry has slowly regained momentum increasing job numbers by 16 percent through 2014. Thus, this region is characterized by the services industries and continues to remain with those trends.

Current Development Overview within the Study Area

Land uses throughout the JLUS Study Area range from open space and agriculture to urbanized development within the cities of Box Elder and Rapid City. Development surrounding Ellsworth AFB is characterized as follows:

North

North of Ellsworth AFB is Meade County, which remains mostly undeveloped. The area is largely used for ranching on large tracts of land. Recently, there has been some very low density residential subdivision development, with lot sizes ranging from one to five acres directly north of the base and in the surrounding area. The South Dakota Ellsworth Development Authority (SDEDA) is working with ranchers to purchase development rights to prevent more development and maintain the existing ranches adjacent to the base.

A large ridge along the north boundary of Ellsworth AFB lowers development potential immediately next to the base fence line.

East

Directly east of Ellsworth AFB are lands in both Meade and Pennington Counties and the City of Box Elder. Southeast of the installation, within the City of Box Elder, are most of the public facilities serving the city, including the Box Elder City Hall and the elementary, middle, and high schools. Land outside of the City of Box Elder is generally very rural with some low density residential development. The City of Box Elder plans to annex north of the city, to incorporate the existing residential areas east of the base along with vacant land for future residential development.

South

The southern border of Ellsworth AFB is mostly in the City of Box Elder, with incorporated land in Pennington County beyond the city to the south. Existing development in the City of Box Elder includes some residential and commercial development scattered along Highway 1416. South of Ellsworth AFB, commercial development continues to expand, particularly in the area of Liberty Blvd/I-90 intersection. Recently, a Love's Travel Stop, which includes a Hardee's restaurant, will open in 2015. Additionally, several new commercial businesses have opened in Box Elder during the past year. Extensive future development is not likely in this area, due to potential incompatibility from aircraft noise and aviation safety zones associated with the installation. SDEDA has been focused on purchasing available land from willing sellers in this area to prevent future incompatibility.

West

West of Ellsworth AFB is mostly undeveloped; however, there is potential for future annexation and development from both the City of Box Elder and the City of Rapid City on the southwest. The City of Box Elder city limits extend to the west until Elk Vale Road, where it meets the city limits of Rapid City. Both cities are planning on the future gradual movement and annexation north along Elk Vale Road, west of Ellsworth AFB.

Roadway improvements are expected to increase residential and commercial development in the area. This could spur annexation.

In 2016, Meade County will be paving Elk Vale Road, north from Pennington County up to Elk Creek Road. Elk Creek Road will also be paved west of Elk Vale Road to the I-90 in 2016. The roadway improvement is expected to increase residential and commercial development in the area, which could spur annexation.



Ellsworth AFB is located in both Meade and Pennington County. The northern part of Ellsworth AFB is located in Meade County and the southern is located in Pennington County in the City of Box Elder. One mile from the southern tip of the base lies Interstate 90 (I-90). Ellsworth AFB is considered to be a part of the Rapid City Metropolitan Area.

Identifying and describing the various activities performed on the operating facilities and in the surrounding airspace provides valuable insight into the importance of Ellsworth AFB as a national strategic asset and as a part of the fabric of the surrounding communities including the Rapid City 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 Ellsworth AFB that could potentially impact the viability and future role of the base.

Installation Setting

The installation includes 6,223 acres of land and is located in a relatively sparsely populated area in western South Dakota, although the surrounding cities of Box Elder and Rapid City have been growing at a higher rate than the rest of the state. The majority of the land surrounding the installation is rural and is used for ranching, agriculture and logging in the nearby Black Hills National Forest, which is west of the base.

Ellsworth AFB participates in the Military Housing Privatization Initiative (MHPI). The MHPI was designed and developed to attract private sector financing, expertise, and innovation to provide necessary housing faster and more efficiently than traditional military construction (MILCON) processes would allow. In 2012, as part of this strategy to provide long-term housing solutions, Ellsworth AFB privatized its base housing.

This commenced with the transfer of ownership of 825 existing, USAF owned, family housing units to Hunt Military Communities. These units are referred to as Antelope Ridge and are located directly to the east of EAFB. Antelope Ridge is comprised of two, three, four and five bedroom homes that include an attached garage and fenced backyard and are available for rent to military and non-military renters.

In addition to Antelope Ridge, Ellsworth AFB transferred ownership of 283 existing family housing units to Balfour Beatty Communities in 2013. These units consist of three and four bedroom units with garages and fenced back yards. They are located in the Rushmore Heights (183 units) and Prairie View (100 units) neighborhoods within the fence. Balfour Beatty Communities is also in the process of constructing an additional 214 units, a Community Center and site amenities.

There is also Unaccompanied Housing (UH) in the form of dormitories available for single Airmen. There are a total of 742 rooms in six dormitory buildings which are all single-occupancy. These are all located east of the Airfield and all of the operations buildings.

Located just off-site, the South Dakota Air and Space Museum proudly displays the past, present, and future of aircraft technologies to the public.

Current Mission Operations

Under the 8th Air Force, the 28th BW is one of two strategic bomber wings in the United States Air Force. The 28th BW's mission is to "Guarantee our Nation's Combat Airpower – Anytime, Anywhere" meaning to deliver expert combat power for global military response. The 28th Bomb Wing is divided into the 28th Operations Group, the 28th Maintenance Group, the 28th Mission Support Group, and the 28th Medical Group.

Tenant units at Ellsworth AFB comprise of the following: Air Force Financial Services Center, Defense Logistics Agency Disposition Services, Defense Security Service, Detachment 226, Air Force Office of Special Investigations, Detachment 8, 372nd Training Squadron, Northwest Area Audit Office, and Air Force Audit Agency.

Ellsworth AFB Mission Footprint

Mission activities conducted on and around Ellsworth 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 aircraft accidents. 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 land use and informed decision making.

There are several elements that make up the mission footprint that extends outside the Ellsworth 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 are described in more detail on the following pages.

Ellsworth 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

Airfield Approach and Departure Flight Tracks

According to the Ellsworth 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 illustrates the primary flight tracks used by Ellsworth AFB aircraft. Other flight tracks may also be used depending on operational concerns, such as weather or mission.

Source: Air Installation Compatible Use Zone Report, Ellsworth Air Force Base, November 2008

Figure 3

Mission Footprint: Flight Patterns

Legend

Military Flight Tracks

Departure

Arrival

Closed Pattern

Ellsworth Air Force Base

County Boundary

Rapid City

Box Elder

Other Incorporated Community

Other Unincorporated Community

Water Body

River

Interstate

Federal Highway

State Highway

Major Roads

Local Traffic

Railroad

Airfield Surface / Runway

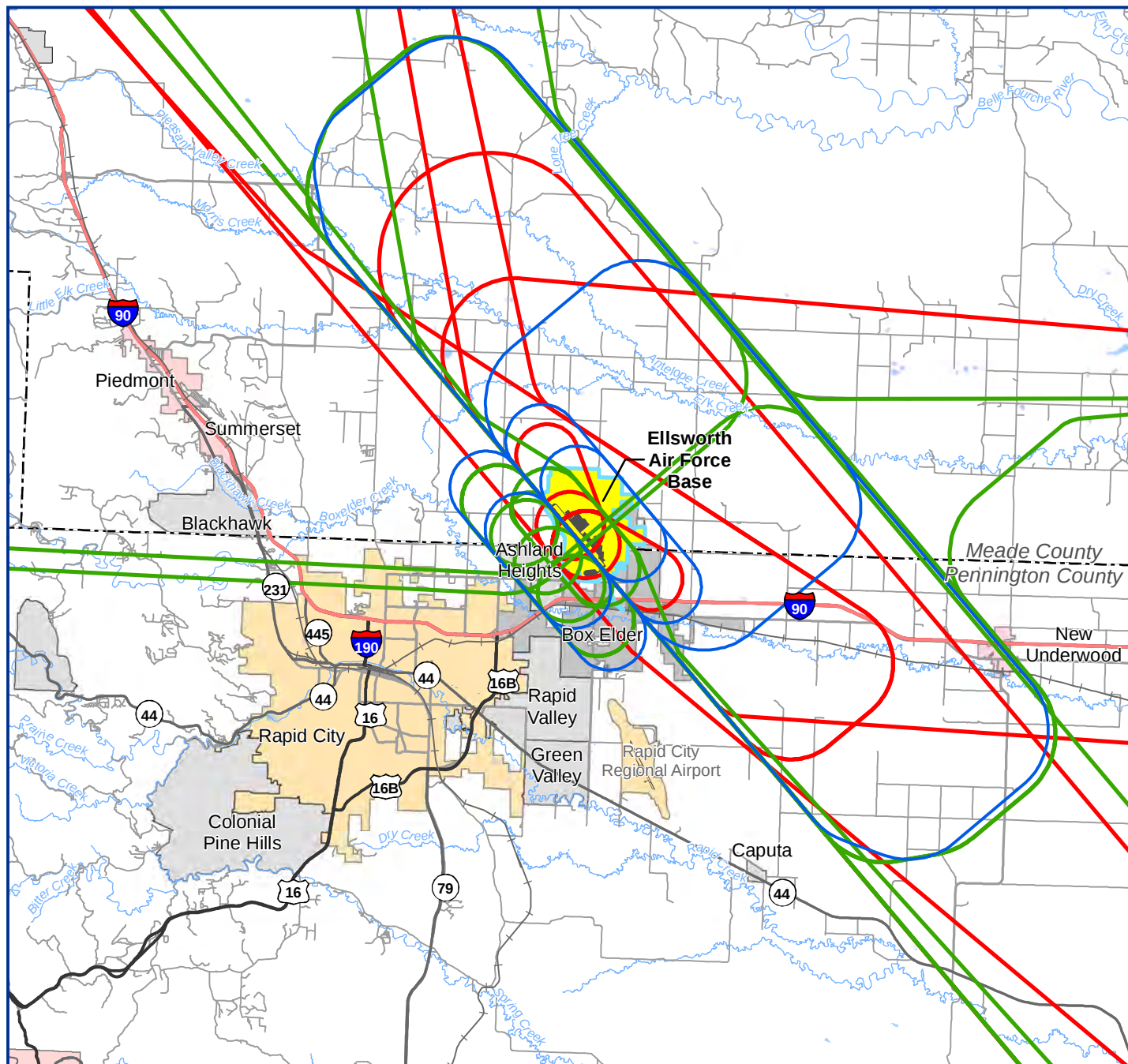
Source: TIGER, 2015,
Matrix Design Group, 2015,
Ellsworth Air Force Base, 2015.



Matrix
DESIGN GROUP



0 2 4
Miles



Imaginary Surfaces

Federal Aviation Regulations, Part 77, specifies 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. 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.

Figure 4 illustrates the imaginary surfaces at Ellsworth AFB. For a complete technical explanation of the imaginary surfaces see Chapter 3, Military Profile (Section 3.7) of the Background Report.

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). For a complete technical explanation of APZs, see Chapter 3, Military Profile (Section 3.7) of the Background Report.

There are three safety zones that extend from the ends of runways: Clear Zone (CZ), APZ I and APZ II. The CZ is the area that begins at each end of the runway. At Ellsworth AFB, the Runway 13/31 CZ measures 3,000 feet wide by 3,000 feet long. This is the area that has the highest potential of an aircraft incident. It is recommended that no development occur in the CZ unless it is a use that is needed for safe operations of aircraft.

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

The safety zones are illustrated on Figure 5.

Source: Air Installation Compatible Use Zone Report, Ellsworth Air Force Base, November 2008

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 Ellsworth 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 Ellsworth AFB.

Noise levels are depicted visually as noise contours that connect points of equal value. These noise contours are drawn in five decibel (dBA) increments from DNL of 65 dBA up to 80 dBA, and are overlaid on a map of the Ellsworth AFB vicinity. The 80 dB DNL is the “loudest” contour line computed and the 65 dB DNL is the “quietest”. The DNL measure has been determined to be a reliable measure of community sensitivity to aircraft noise and has become a standard metric used to map aircraft noise impacts. For a complete technical explanation of noise contours at Ellsworth AFB, see Chapter 3 (Section 3.7) in the Background Report.

The 2008 noise contours are illustrated on Figure 6.



Figure 4

Mission Footprint: Imaginary Surfaces

Legend

Airfield Imaginary Surface

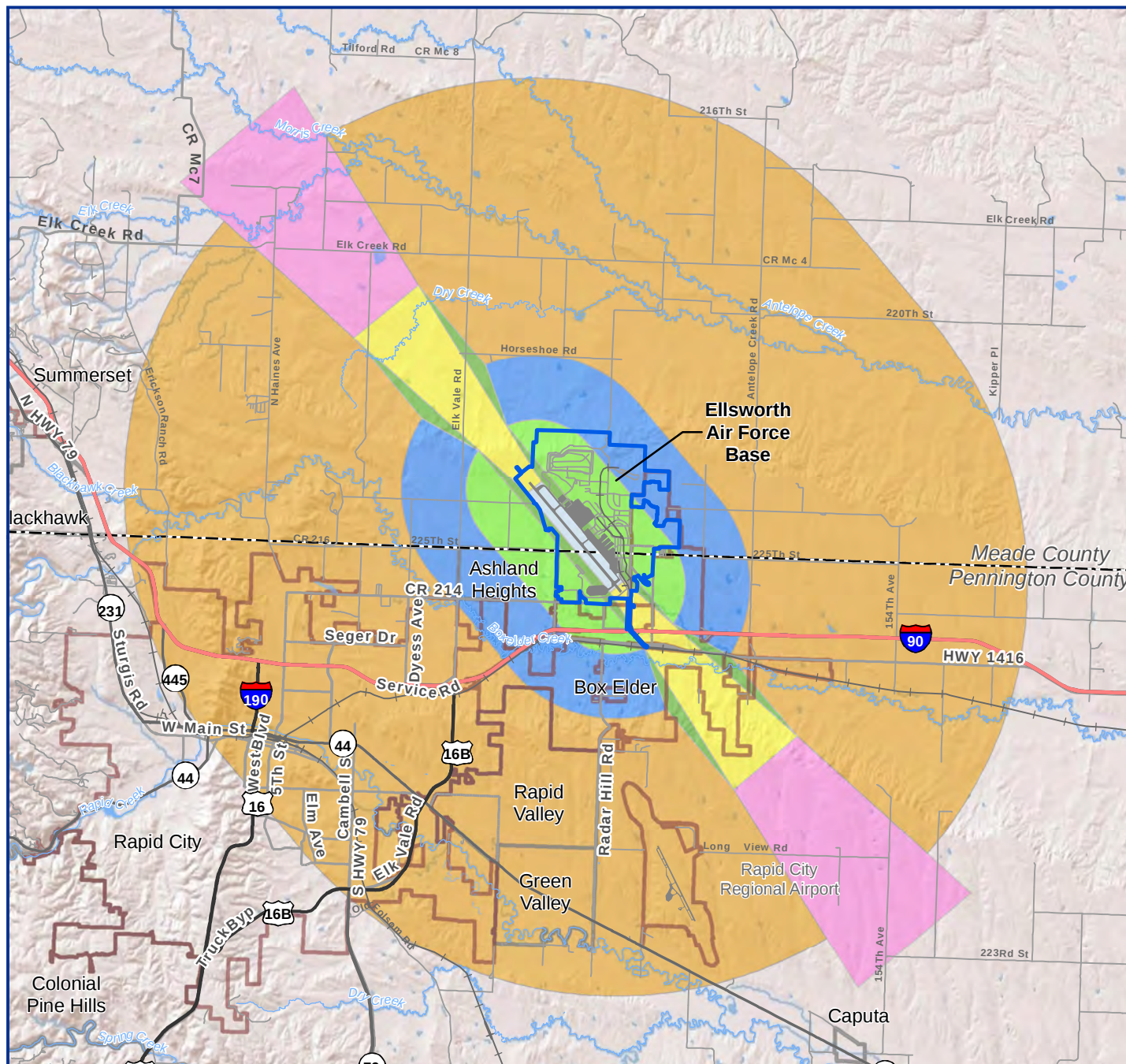
- Primary Surface
- Approach/Departure Clearance Surface (50:1)
- Approach/Departure Clearance Surface (Horizontal)
- Inner Horizontal Surface
- Conical Surface (20:1)
- Outer Horizontal Surface
- Transitional Surface (7:1)

- Ellsworth Air Force Base
- County Boundary
- Incorporated Community
- Unincorporated Community
- Water Body
- River
- Interstate
- Federal Highway
- State Highway
- Major Roads
- Local Traffic
- Railroad
- Airfield Surface / Runway

Source: TIGER, 2015,
Matrix Design Group, 2015,
Ellsworth Air Force Base, 2015.



0 1 2 3 Miles



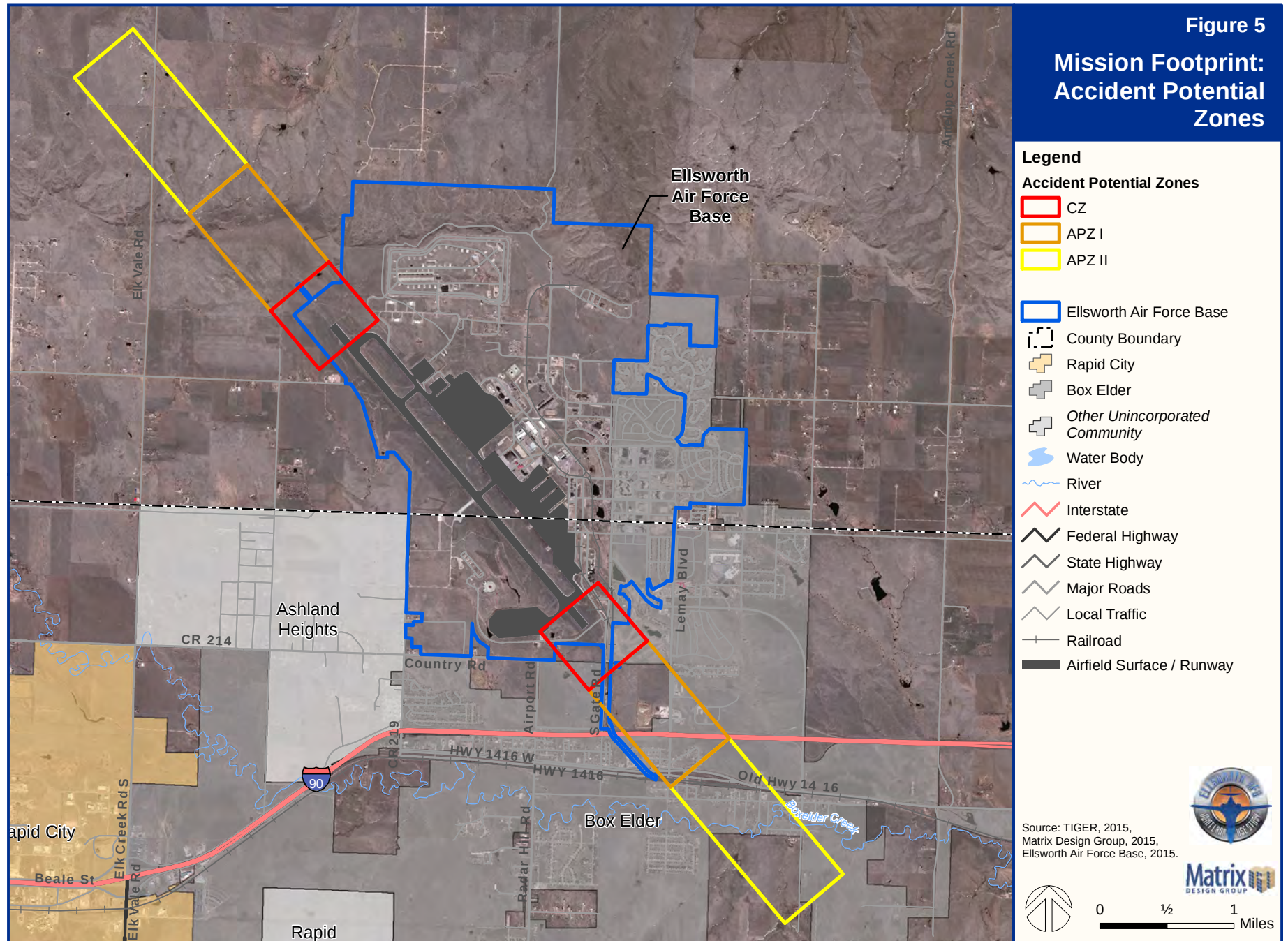


Figure 6

Mission Footprint: Noise Contours

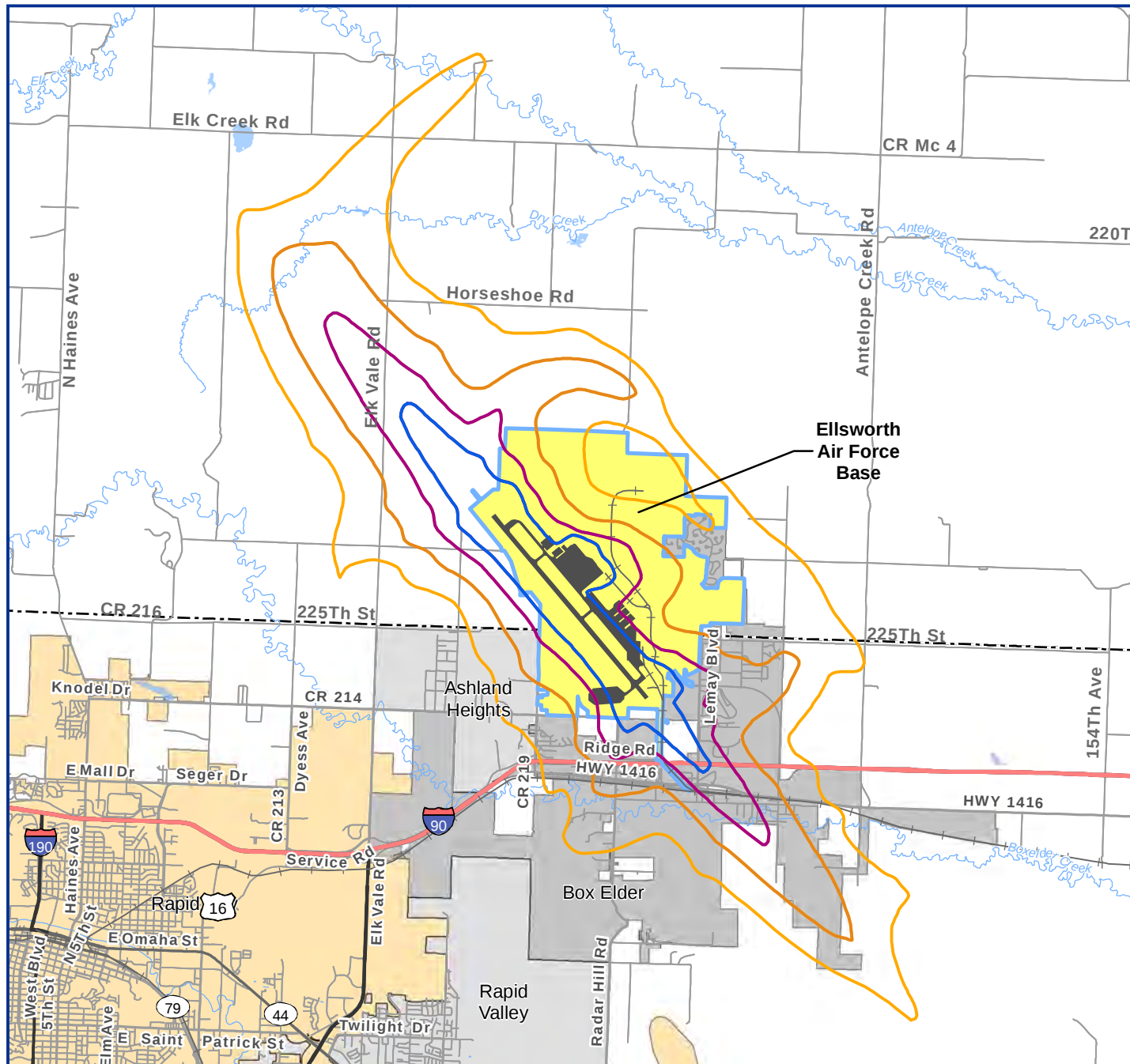
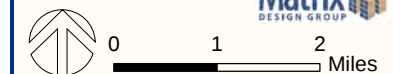
Legend

2008 DNL Noise Contour (dB)

- 65 DNL
- 70 DNL
- 75 DNL
- 80 DNL

- Ellsworth Air Force Base
- County Boundary
- Rapid City
- Box Elder
- Other Incorporated Community
- Other Unincorporated Community
- Water Body
- River
- Interstate
- Federal Highway
- State Highway
- Major Roads
- Local Traffic
- Railroad
- Airfield Surface / Runway

Source: TIGER, 2015,
Matrix Design Group, 2015,
Ellsworth Air Force Base, 2015.



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.

Ellsworth AFB is approximately six miles northwest of Rapid City Regional Airport. Although Ellsworth AFB is a private-use military airport, and Rapid City Regional Airport is a public use airport, they have a shared Class D airspace. Class D airspace can generally be described as a controlled airspace that extends from the surface or a given altitude to a specified higher altitude. At Ellsworth AFB, Class D airspace extends from the surface up to and including 5,800 feet above mean sea level (MSL) with a 5.9-nautical mile radius from the airport center. Class D airspace for Rapid City Regional Airport extends from the surface up to and including 5,700 feet above MSL with a 4.3-nautical-mile radius.

The Class D airspace area is illustrated on Figure 7.

Part 77 Vertical Obstruction Compliance

FAA Regulation Title 14 Part 77, commonly known as Part 77, 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.

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. 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 8 provides an illustration of this measure of vertical obstruction. Note that this is in addition to, not a replacement of, imaginary surface information discussed previously.

Bird / Wildlife Aircraft Strike Hazard Relevancy Area

Birds and wildlife can represent a significant hazard to military training and flight operations. Certain types of land uses attract birds and wildlife such as standing water and grasslands. While there have been an insignificant number of fatalities associated with bird air strike hazards (BASH) in the past 30 years, the concern associated with BASH is the significant amount of damage a BASH incident can cost the federal government. Since fiscal 1985, the Air Force has spent more than \$820 million repairing aircraft damaged by collisions with birds.

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

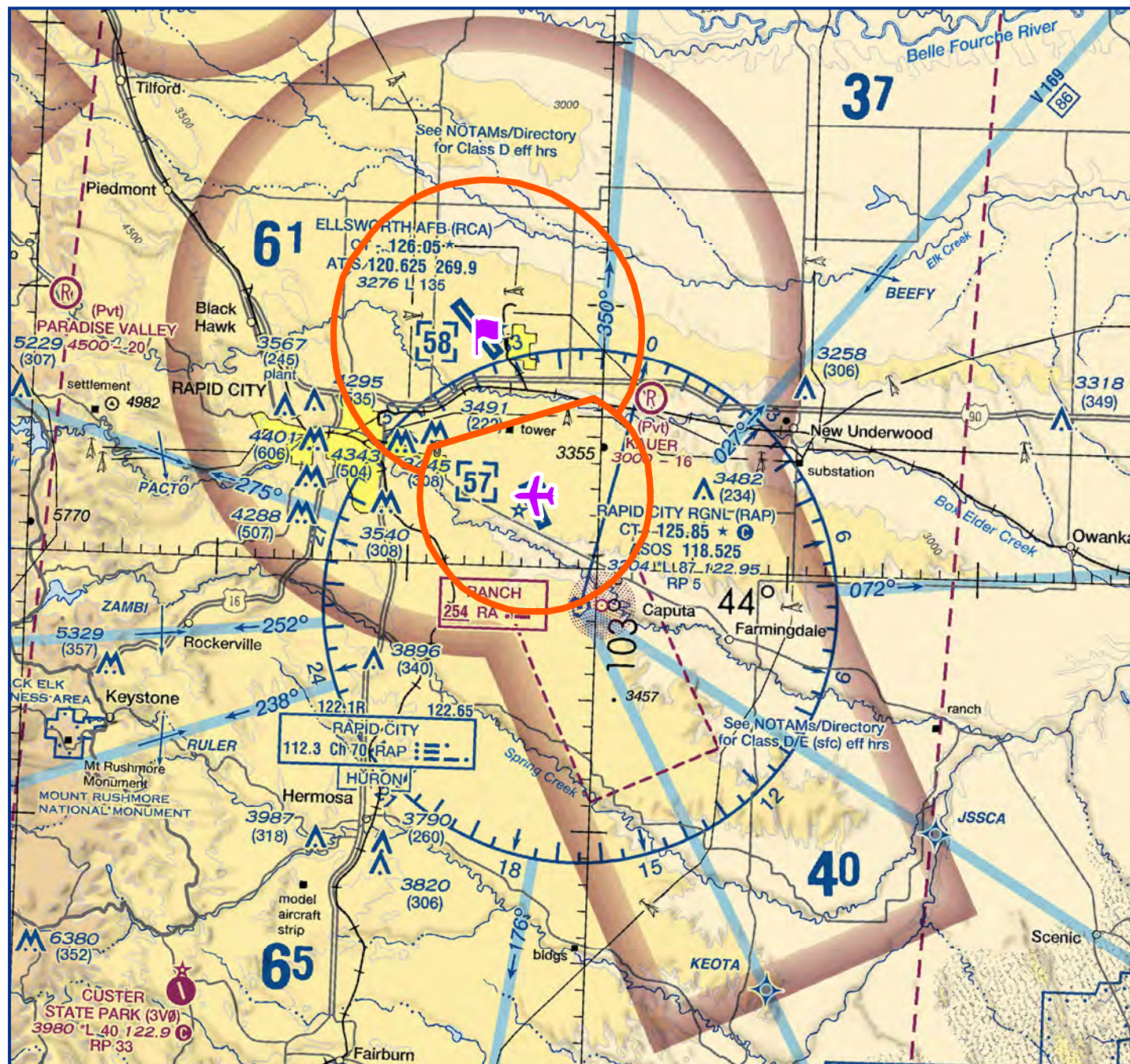
Figure 9 shows the FAA five-statute mile around the air operations area that has been studied as having a high risk profile associated with aircraft collisions with birds and wildlife due to aircraft flying at lower altitudes and slower speeds.

Figure 7

Airspace Control

Legend

-  Class D Airspace (Airspace Control Area)
-  Ellsworth Air Force Base
-  Rapid City Regional Airport



Source: USDOT FAA
Sectional Charts, 2015.



0 2 4 6 Miles



Matrix
DESIGN GROUP

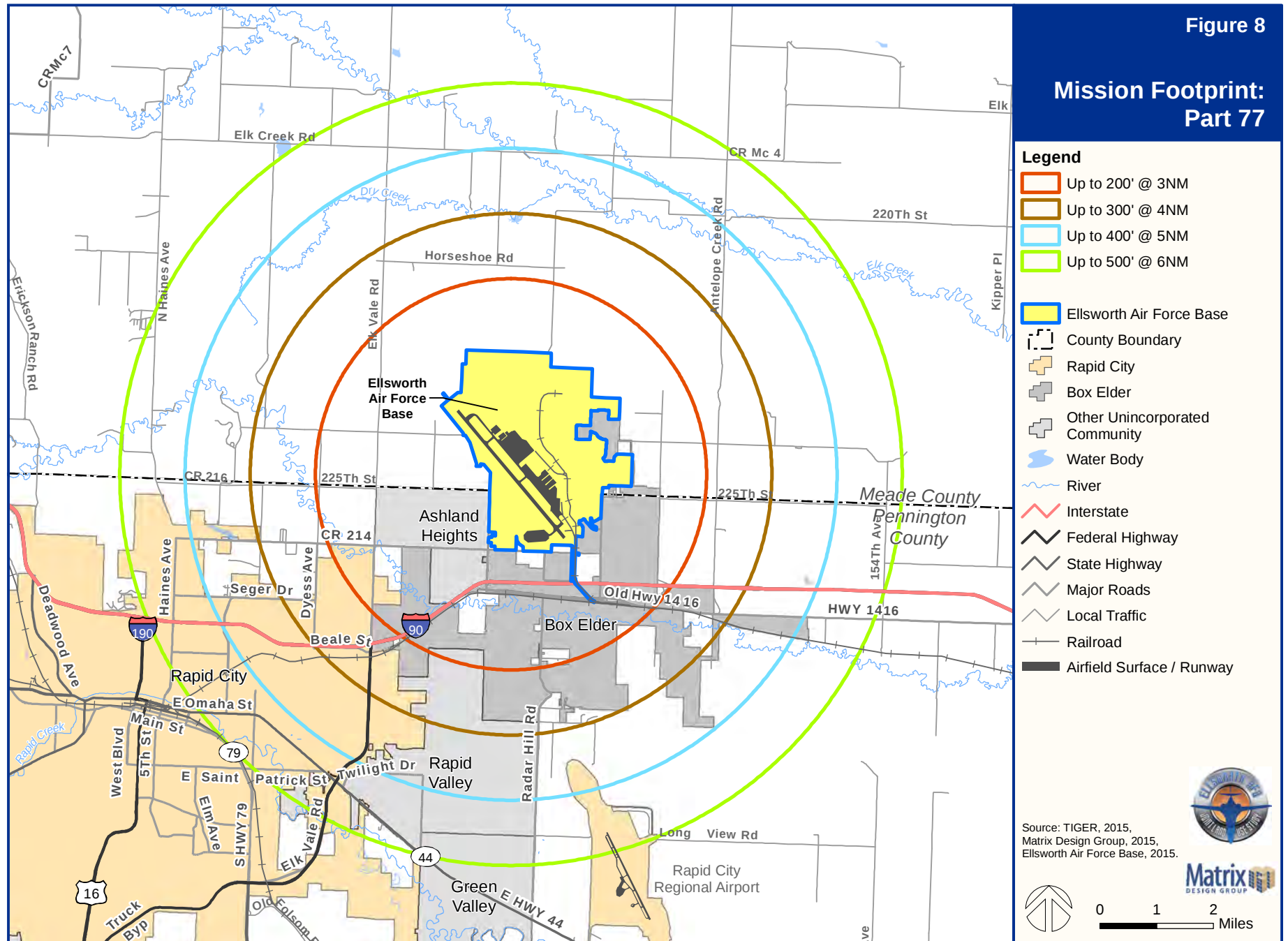


Figure 9

Mission Footprint: BASH Relevancy Area

Legend

-  5-mile BASH Relevancy Area
-  Airport Operations Area
-  Ellsworth Air Force Base
-  Airfield Surface / Runway

-  County Boundary
-  Rapid City
-  Box Elder
-  Other Unincorporated Community
-  Water Body
-  River
-  Interstate
-  Federal Highway
-  State Highway
-  Major Roads
-  Railroad

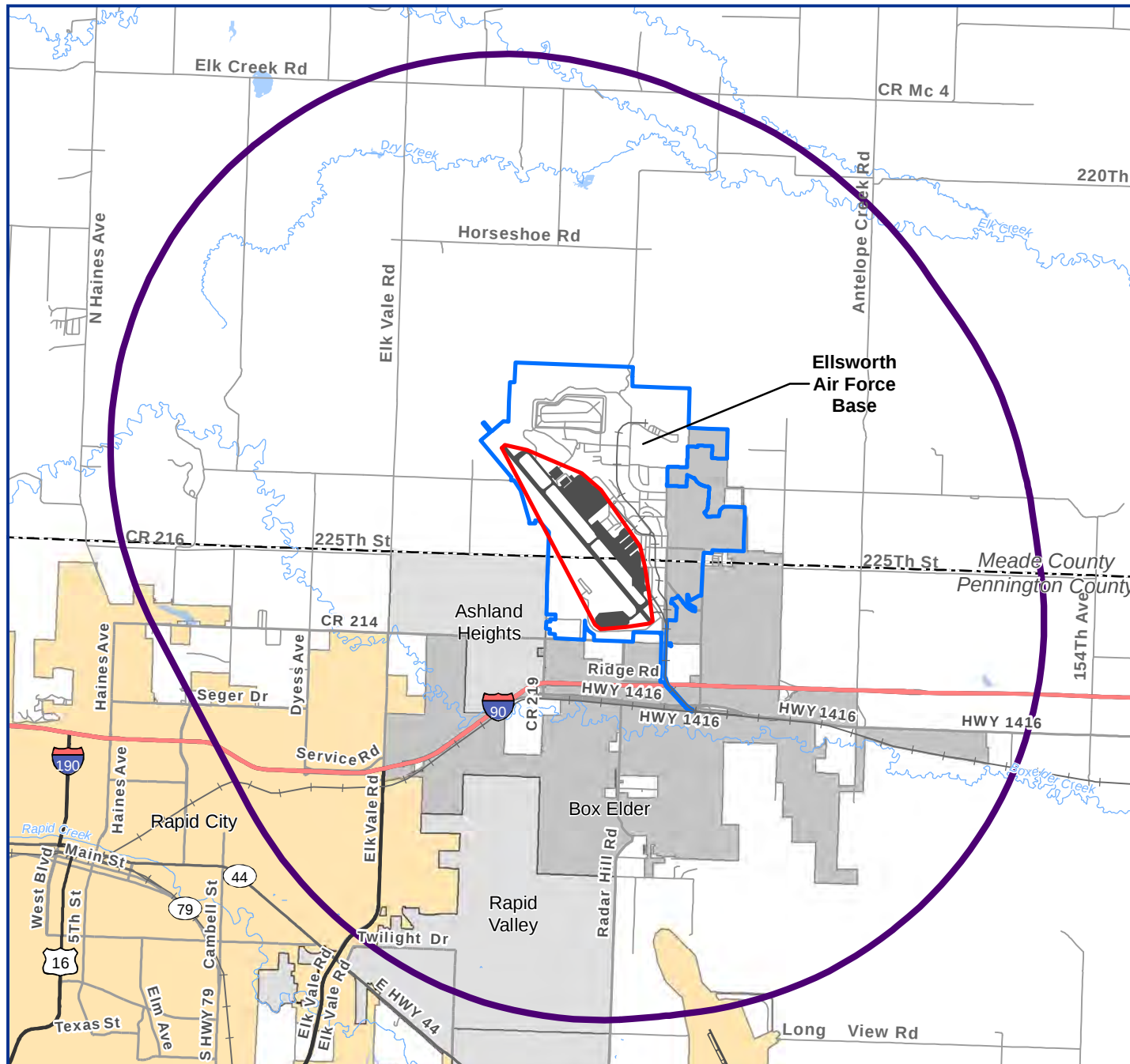
Source: TIGER, 2015,
Matrix Design Group, 2015,
Ellsworth Air Force Base, 2015.



Matrix
DESIGN GROUP



0 1 2 Miles



Please see the next page.



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 Ellsworth 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.

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

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 a variety of challenges. Organization encompasses 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). Acting involves implementation of programs. Lastly, monitoring involves maintaining awareness of mission needs and encroachment issues.

DOD Energy Siting Clearinghouse

Section 358 of the 2011 National Defense Authorization Act sanctioned 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.

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, published 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/>.

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.

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.

Partners in Flight Program

The DOD has implemented a program, called Partners in Flight, which 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.

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 on the USAHAS website at <http://www.usahas.com/>.

Federal programs provide authority for state and local governments to implement actions to protect the military and the community.

Ellsworth AFB Plans and Programs

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 AICUZ provides recommendations to local government and other entities for action that they can implement to further compatibility goals and

objectives of their comprehensive master plans, development codes (zoning ordinances), and other land use regulations.

Bird / Wildlife Aircraft Strike Hazard Plan

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.

State of South Dakota

South Dakota Ellsworth Development Authority

The State of South Dakota, through the South Dakota Ellsworth Development Authority (SDEDA), is the local sponsor of the Ellsworth AFB JLUS. In 2009, the South Dakota legislature created the South Dakota Ellsworth Development Authority (“SDEDA” as a body corporate and politic of the State of South Dakota. It is governed by SD Codified Law (SDCL) 1-16J. SDEDA’s mission is: (1) to make sure that the Great State of South Dakota is always a Great Place for the US Department of Defense to conduct its essential National defense mission at Ellsworth Air Force Base; (2) to work hand in hand with local governments, the private sector, and property owners to promote the health and safety of those living or working near the Base; (3) to protect and promote the economic impact of Ellsworth Air Force Base and

associated industry; and (4) to work with the Base and local communities to prepare for additional growth in missions at Ellsworth Air Force Base. The Base was originally listed on the 2005 BRAC list designated for closure; however, the State of South Dakota developed and authorized the SDEDA to protect and promote the economic impact of Ellsworth AFB and its associated industry. Due in part to the State's proactive action, the Base was removed from the BRAC list.

SDEDA is a public entity with the authority to exercise essential public functions. SDEDA reports to the State's Governor's Office of Economic Development. SDEDA comprises seven members appointed by the Governor with the advice and consent of the State Senate. The chair is designated by the Governor, and the members elect other officers as is necessary. SDEDA has the authority to employ agents and employees as is necessary to execute the mission and its related duties.

SDEDA is authorized to exercise various powers including, but not limited to, the following:

- Apply for and use gifts, grants, or loans of money or other property from the United States, the state, a unit of local government, or any person for any authority purposes and enter into agreements required in connection therewith;
- Employ fiscal consultants, engineers, attorneys, management service providers, and such other consultants and employees as may be required, and contract with agencies of the state to provide staff and support services;
- Borrow money and issue bonds, certificates, warrants, notes, or other evidence of indebtedness as provided by this chapter; and
- Purchase from a willing seller or by eminent domain, construct, develop, maintain, hold, lease, license, operate, dispose of, or decommission real and personal property projects, facilities, or any undertaking necessary



for establishing compatible land use, as provided for in subdivision 50-10-32(2) around Ellsworth Air Force Base, or generally suitable for protecting or promoting the economic impact on the state of Ellsworth Air Force Base and related industries.

SDEDA received a grant to conduct this JLUS from the Department of Defense Office of Economic Adjustment (OEA) and is the project manager for the JLUS effort as well as guiding the implementation of the programs recommended under the 1995 JLUS.

State of South Dakota Hazard Mitigation Plan

The State of South Dakota Hazard Mitigation Plan establishes guidelines and procedures for hazardous responses. Elements of the plan include a risk assessment, mitigation strategy and progress, and local mitigation planning coordination. The plan identifies military installations as an example of a high potential loss facility.

Local Jurisdiction Planning Tools

General Plans, Zoning, and Subdivision Regulations

The planning tools used by the study area jurisdictions were analyzed and categorized as permanent, semi-permanent, or conditional. In South Dakota, 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.

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 city council, 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. Chapter 9-4 of the South Dakota State Statutes governs the expansion of Municipal Boundaries. A municipality can annex property by a petition of voters and landowners. A municipality can extend its boundaries without a petition; however, the governing body must conduct a study to determine the need for the territory and how the area will be served. Annexations can be an important tool in addressing compatibility issues, if done in conformance with state statutes. 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.

Pennington County

Comprehensive Plan

Pennington County's Comprehensive Plan was adopted in July 2003. It is a document to guide long range development plans of the county and its future growth. The plan contains elements such as population, environmental resources, transportation, and future land use. It is important for Pennington County to recognize future development in regards to Ellsworth AFB by implementing encroachment land use policies and goals.

While Ellsworth AFB is mentioned as a role in the county's history, none of the policies or goals in the plan include the base.

Pennington County future land use goals state the need to identify and estimate future demands for the various land uses and determine policies to:

- To provide for adequate amounts of commercial and industrial land in the future and to ensure attractiveness and stability of these areas.
- To achieve attractive, stable and safe residential areas and to plan for a desirable and compatible mixture of residential densities.
- To protect prime agricultural areas from the encroachment of non-compatible land uses.
- To protect Pennington County's natural resources and areas of scenic beauty through proper land use practices.

The comprehensive plan does not state any land use regulations regarding military installations directly. This plan is outdated and it is recommended that Pennington County update their comprehensive plan to include encroachment policies to further protect Ellsworth AFB's operations.

Source: Pennington County Comprehensive Plan, 2003

Zoning Ordinance

Zoning ordinances have been amended through November 26, 2014. The zoning ordinance divides the land within the county into nine districts, and provides development regulations for these districts. Pennington County's zoning plan does include a stand-alone district for airports.

Section 315 of the Pennington County Zoning Ordinance establishes development standards for the Ellsworth AFB compatible use area. The section establishes overlay zones for the CZ, APZs, and Noise Zones. All buildings, structures, and land uses within the overlay zones must comply

with AICUZ land use compatibility chart. Variances to the development standards may be approved by the Zoning Board of Adjustment.

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

- It is good that Ellsworth AFB is recognized within the county's zoning code, yet the standards lack any provisions beyond the APZs and Noise Zones.
- The topics of noise, vibration, hazardous materials, dust/smoke/steam, and lighting associated with compatibility to the military activities are not addressed in the ordinance.
- Height regulations are outlined for property in the vicinity of Rapid City Regional Airport; however, these regulations do not apply to Ellsworth AFB.
- 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.
- The approval process also does not require any response from an Ellsworth AFB official.

Section 200 details district standards and permitted uses for the 9 districts within the county. Most districts have a maximum height of 35 feet, including districts A-2 (Limited Agriculture), LDR (Low Density Residential), SRD (Suburban Residential), GC (General Commercial), and HS (Highway Service). The LI (Light Industrial) district maintains a maximum height of 45 feet. The HI (Heavy Industrial) and A-1 (General Agriculture) districts have no height regulations. Towers are not to exceed 300 feet above ground level.

Section 317 establishes regulations for wind energy systems. A setback from Ellsworth AFB for large wind energy systems prohibits the systems within Class Delta Airspace. In addition, before construction of the system, the developer must submit written documentation from Ellsworth AFB

acknowledging the location and size of the proposed large wind energy system.

Source: Pennington County Zoning Ordinance, 2014

Meade County

Comprehensive Plan

Meade County's Comprehensive Plan was established to guide land uses with future population growth without impacting the natural environment of the county. 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. Meade County values the protection of the natural environment and cultural activities that take place among the communities.

The following policies have been recognized as a compatibility factor in relation to military installations:

- Development and construction in elevated noise areas around airports or airbases needs to follow established practices written for noise mitigation.
- Adopt noise attenuation guidelines for construction of habitable dwellings and buildings in elevated noise areas established by the Department of Air Force.
- Encourage state and federal agencies to acquire funding for the purchase of development rights for property around Ellsworth Air Force Base to limit development in areas that have noise levels above 70 dBA.

The following deficiencies concerning military compatibility are based on a review of the Comprehensive Plan:

- The goals and policies of some elements, such as land use and transportation, do not take the military installation presence or mission into consideration.

Source: Meade County Comprehensive Plan, 2010

City of Box Elder

Comprehensive Plan

The City of Box Elder Comprehensive Plan, revised in 2014, is a long range plan to guide and direct growth in the city that includes goals, policies, and objectives. The plan includes Ellsworth AFB and describes the work necessary to transform the local economy by establishing a new long-range vision. Topics covered in the plan include land use and growth, housing, economic development, transportation, community facilities, parks, and utilities, and implementation. Other plans included in the plan are Future Land Use Plan, Major Street Plan, Neighborhood Opportunities and Constraints, and Non-motorized Vehicle Plan. Five neighborhoods are designated in the plan, including the Liberty Boulevard Neighborhood, which contains the main entrance to Ellsworth AFB, along with land to the east and south of the base.

The plan includes a section dedicated to the 2008 Ellsworth AFB Air Installation Compatible Use Zone (AICUZ) Study, outlining the constraints that result from flight operations and providing land use and zoning suggestion for implementation. Suggestions include the following:

- The municipalities surrounding the installation should provide timely notification to Ellsworth AFB regarding new development plans within the noise zones or APZs.
- Unzoned areas encompassed by the noise zones and APZs for Ellsworth should be zoned to ensure compatible development.

- The zoning ordinances for the City of Box Elder should be modified to reflect the compatible land uses outlined in this AICUZ Study.
- Provide for real estate disclosures in noise zones and APZs around Ellsworth.
- Subdivision regulations should provide for rejection of new subdivisions that are not compatible with AICUZ land use guidelines and provide controls for continued development in existing subdivisions.
- Local municipalities should exercise caution when approving transportation plans, such as the scheduled 2011 bridge replacement on Spruce Street over Box Elder Creek, to ensure that such plans would not impact Ellsworth's ability to fulfill its mission requirements.

The importance and support of Ellsworth AFB is well covered in the City of Box Elder's Comprehensive Plan. The following policies have been recognized as a compatibility factor in relation to military installations:

- There is a pressing need for the City of Box Elder to address airfield operations compatibility issues by establishing guiding policies, goals, and objectives in its Comprehensive Plan.
- Drawing on Ellsworth AFB as an economic engine, the City of Box Elder aims to provide a development climate that encourages, incentivizes, and promotes business and entrepreneurs.
- The plan includes constraints that result from flight operations at Ellsworth AFB and provides land use and zoning suggestion for implementation.
- Any development proposed north of I-90 and west of North Ellsworth Road must be planned to account for the sound contours, APZ-1, and Clear Zone.

- Inform Ellsworth Air Force Base and surrounding municipal and county planning offices regarding planning and zoning actions that have the potential to affect existing ordinances and/or resolutions.
- Provide timely notification to Ellsworth Air Force Base planners regarding new development plans within noise zones, APZs, and airport influence areas.
- Encourage joint planning efforts between the Box Elder and Ellsworth planners that identify subdivision ordinances to identify compatible residential land uses and densities surrounding Ellsworth and APZ1 and APZ-2.
- The City of Box Elder shall coordinate with Ellsworth to plan efficient circulation and for goods deliveries. The City's transportation system shall work to support Ellsworth's current mission.

Zoning Ordinance

The purpose of the zoning ordinance is to serve the general welfare of the city and to recognize specific, sustainable, and compatible uses for areas within its jurisdiction. The zoning ordinance divides the land within the city into 5 base districts. Section six describes the regulations and permitted uses for each district.

Lighting is regulated to be directed away from adjoining properties, but only applies to parking areas. The maximum structure height in almost all of the zoning districts, AD (Agriculture District), CD (Commercial District), ID (Industrial District), and RD (Residential District), is 35 feet. The maximum structure height for the MD (Mobile Home) district is 24 feet.

Telecommunication facilities are permitted up to a height of 100 feet, or 150 feet with a variance. Wind energy systems are to be less than 75 feet.

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

- Ellsworth AFB is not recognized within the City's zoning code.
- Lighting height standards are permitted to 35 feet unless the City grants an exception.
- Communication towers and alternative energy production devices uses are permitted by special use permits within AG and RR districts, which could interfere with Ellsworth AFB flight operations.
- Maximum heights for wind energy conservation systems are able to exceed 50 percent of the permitted districts height limit.
- The zoning ordinance does not provide sound attenuation standards to further protect the community from military operations.

Source: City of Box Elder Zoning Ordinance, 2009



Identification of Compatibility Issues

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 can be evaluated to determine whether community and military plans, programs, and activities are compatible or in conflict. For this Joint Land Use Study (JLUS), 25 compatibility factors were used to identify, determine, and establish a set of key JLUS compatibility issues for discussion in the Ellsworth AFB JLUS.

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
HA	Housing Availability	VO	Vertical Obstructions
IE	Infrastructure Extensions	V	Vibration
		WQQ	Water Quality / Quantity

Methodology and Evaluation

The methodology for the Ellsworth AFB JLUS consisted of a comprehensive and inclusive discovery process to identify stakeholder issues associated with the compatibility factors. At the initial Executive Committee (EC) and Working Group (WG) meetings and public workshop, 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 EC, WG, and the public examined and prioritized the compatibility issues identified. Other factors and associated issues were analyzed based on available information and similarity with other community JLUS experiences around the country.

- Of the 25 compatibility factors considered, no issues were identified for the following factors:

- Climate Adaptation
- Cultural Resources
- Frequency Spectrum Capacity
- Frequency Spectrum Impedance / Interference
- Light and Glare
- Marine Environments
- Public Trespassing
- Scarce Natural Resources
- Vertical Obstructions

Organization of the Issues

The compatibility issues are organized by Major Issues and Minor Issues. The Major Issues are analyzed in depth in Chapter 5 of the Background Report and have strategies developed for them in Chapter 6 of this JLUS document. Minor issues are issues that have been raised through the public input process, but were not further pursued for various reasons, including, but not limited to: they were outside the scope of this report or did not warrant additional follow up.

Major Issues

Air Quality

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 and ozone) and potential non-attainment of air quality standards that may limit construction, maintenance, or operations at the installation or in the area. The following Air Quality issue was identified:

- **Regional air monitoring.** Rapid City was not in attainment for particulate matter about 10 years ago, but achieved attainment and needs to stay in attainment.

Anti-Terrorism / Force Protection

Anti-Terrorism / Force Protection (AT/FP) relates to the safety of personnel, facilities, and information on an installation from outside threats. 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. The following Anti-Terrorism / Force Protection issues were identified:

- **Potential observation at the Commercial Gate.** There are areas where unauthorized civilian could potentially observe operations at the Commercial Gate.

- **Potential for observation in sensitive areas north and west of Ellsworth AFB.** Sensitive areas outside of the northwest area of the base could be developed creating security concerns.
- **Wagon Wheel encroachment.** Location of homes within 10 feet of fence line in Meade County / Box Elder.
- **Certain areas of the fence line are of average quality of construction.** Mediocre fence line segments should be augmented to deter potential encroachment.

Biological Resources

Sensitive biological resources include federal and state listed species (threatened and endangered) and the habitats they live in or otherwise use. These resources may also include areas such as wetlands and migratory corridors critical to the overall ecosystems. The presence of sensitive biological resources may require special development considerations or operational procedures and their assessment should be included early in the planning process. Changes in the types or amount of habitat off-installation can also make on-installation habitats more constrained by overall reductions in the area. The following Biological Resources issue was identified:

- **Conservation sensitive species warrant special care during new construction on base to minimize habitat disturbance.** These species are the Swainson's hawk, burrowing owl and silver haired bat.

Coordination / Communication

Coordination / communication 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. The following Coordination / Communication issues were identified:

- **Regional cooperation and coordination.** Improve and formalize cooperation and relationships with the Rapid City Area Metropolitan Planning Organization (MPO) and Jurisdictions, SDEDA, and Ellsworth AFB.
- **Need for improved public communication and transparency of SDEDA operations.** The general public in Box Elder needs to properly understand the operations at SDEDA, relative to compatibility.
- **Better communication regarding special events on base.** There is a need for improved notification for base operation events that result in increased noise.

Dust / Smoke / Steam

Dust results from the suspension of particulate matter in the air. Dust (and smoke) can be created by fire (e.g., controlled or prescribed burns, agricultural burning), ground disturbance (e.g., agricultural activities, military operations, grading), industrial activities, or other similar processes. Dust, smoke and steam can be a compatibility issue if sufficient in quantity to impact flight operations (such as reduced visibility or cause equipment damage) or otherwise interfere with military operations. The following Dust / Smoke / Steam issue was identified:

- **Smoke from Ellsworth AFB operations.** Smoke from prescribed burns or fire training activities at Ellsworth AFB can impact pilot visibility and off-site activity.

Energy Development

Development of energy sources, including alternative energy sources (such as solar, wind, geothermal, or biofuels) can pose compatibility issues if not planned, sited, and developed with compatibility in mind. The following Energy Development issue was identified:

- **Wind energy development.** High wind energy potential could attract wind energy generation development in the area.

Housing Availability

Local housing availability addresses the supply and demand for housing in the region, the competition for housing that may results from changes in the number of military personnel, and the supply of military family housing provided by the installation. The following Housing Availability issues were identified:

- **Removal of Centennial Estates from Military Family Housing.** Conversion of 825 units on the base Military Housing from Civilian Housing could result in a housing shortage for military personnel.
- **Residential areas on Ellsworth AFB have been annexed into the City of Box Elder.** Public safety calls from residential units on the base that are a part of the City of Box Elder, generate a response from the Box Elder public safety units and not the EAFB Military Police.
- **Lack of affordable housing and apartments.** Median values and rents of homes are increasing, leaving base personnel with limited affordable options.

Infrastructure Extensions

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. The following Infrastructure Extensions issues were identified:

- **Power lines currently limit the expansion of county road in Meade County.** There is a desire to expand County Road 214, but the fence line, power lines, and a contamination site is currently limiting the expansion.
- **Road improvement in Meade County could lead to incompatible residential development.** The improvement of Meade County roads could lead to incompatible residential development in southern Meade County.
- **New sewer line could lead to increased development.** A new sewer main on Dyess Avenue to County Road could stimulate development in incompatible areas.

Land / Air / Sea Spaces

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 land and air operations can compete for limited air and sea space, especially when the usage areas are proximate to each other. Use of this shared resource can impact future growth in operations for all users. The following Land / Air / Sea Spaces issue was identified:

- **Non-military drones.** Due to lack of coordination with the FAA and / or Ellsworth AFB, non-military drones could interfere with military operations at Ellsworth AFB.

Land Use

The basis of land use planning relates to the government's role in protecting the public's health, safety, and welfare. County and local jurisdictions' growth policy plans, zoning ordinances, and subdivision regulations 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 impact the use of another. For instance, industrial uses

are often separated from residential uses to avoid impacts related to noise, odors, lighting, etc. The following Land Use Issues were identified:

- **Lack of zoning in Meade County.** There are no zoning controls in Meade County surrounding the base, which could result in incompatible development within the noise contours or APZs.
- **The vacant school adjacent to Ellsworth AFB must be redeveloped according to compatibility with the AICUZ.** A vacant school nearby the Patriot Gate owned by Douglas Schools may be converted into a use that is incompatible with the existing Ellsworth AFB AICUZ.
- **Incompatible Development Near Ellsworth AFB.** Development in existing unincorporated areas could have compatibility issues depending on land use type and location. Potential infrastructure improvements may be growth inducing in areas near the base if not planned with compatibility in mind.

Legislative Initiatives

Legislative initiatives include those existing and proposed federal, state, and local laws and regulations that may have a direct or indirect effect on a military installation to achieve its current or future mission. Federal, state, and local legislative initiatives are important regulatory tools to guide the actions of both local jurisdictions and the military installation. This legislation is not mutually exclusive, as such, it fosters both parties to work together in partnership to improve operational and community sustainability objectives. The following Legislative Initiatives issue was identified:

- **Multiple jurisdictional authorities.** There are multiple jurisdictional authorities on portions of Ellsworth AFB that place the area under legal jurisdiction of multiple authorities.

Noise

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. The following Noise issues were identified:

- **Noise complaints from areas surrounding Ellsworth AFB.** Flight operations, such as engine runups and combat departures, create loud disruptions and generate noise complaints when noise occurs outside of typical operation times, such as night flight or special training.
- **Rapid City is not within the boundaries of noise zones.** Proximity to noise zones and fluctuations in noise exposure levels may still cause noise issues for the northern boundary of Rapid City and boundary of Rapid Valley.
- **Incompatible land uses in 75-80+ noise zone.** Residential, commercial, and public / semi-public land uses in the City of Box Elder are located in this noise zone.
- **Need for noise attenuation improvements for low income housing.**

Roadway Capacity

Roadway capacity relates to the ability of existing freeways, highways, arterials, and other local roads to provide adequate mobility and access between military installations and their surrounding communities. 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. The following Roadway Capacity issues were identified:

- **Demand for transit service to and from Ellsworth AFB.** According to findings in the Box Elder Transportation Plan, there is an unmet demand for transit to and from Ellsworth AFB.
- **Increased traffic congestion on roads due to closure of highway access, Exit 63.** The closure of highway access at Exit 63 has created traffic congestion on other roads.

Safety

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. The following Safety issues were identified:

- **Existing and future bird attractants on and surrounding Ellsworth AFB pose strike threats.** Ponds that are located on and off of the base attract waterfowl.

- **Ellsworth AFB does not own all of the land within the Primary Surface.** Land that is part of the Primary Surface is located outside of the fence line and is not owned by Ellsworth AFB. Currently, the fence is located too close to the airfield and violates the Primary Surface requirements.
- **Existing land uses in runway safety zones.** There are some incompatible uses that currently exist within safety zones.

Vertical Obstructions

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 adversely impact military readiness. The following Vertical Obstruction issue was identified:

- **Power poles in Accident Potential Zones.** Incompatible wooden poles that are not easily breakable need to be moved underground.

Vibration

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

- **Vibration from aircraft operations.** Vibrations occur during Ellsworth AFB aircraft takeoffs.

Water Quality / Quantity

Water quality / quantity concerns include the assurance that adequate water supplies of good quality are available for use by the installation and surrounding communities as the area develops. Water supply for agriculture and industrial use is also considered. The following Water Quality / Quantity issues were identified:

- **Deicing fluid.** Although most is captured in basins, there is potential that residual deicing fluid, which is washed off into storm water, could affect water quality.
- **Fuel spill potential.** Contaminant features are typically very effective, yet when high wind and heavy rains are present; it is possible for fuel to spill off base.
- **Past fuel dumping contamination.** There is a superfund site, which was created from fuel contamination that requires monitoring.
- **Potential for fertilizer and pesticide runoff.** Fertilizers and pesticides from base and golf course can potentially runoff into water courses.

Other Issues

Land / Air / Sea Spaces (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 land and air operations can compete for limited air and sea space, especially when the usage areas are proximate to each other. Use of this shared resource can impact future growth in operations for all users. The following Land / Air / Sea Spaces issue was identified:

- **Powder River MOA.** The Powder River MOA may result in an increase in flight frequency around Ellsworth AFB.

Land Use

The basis of land use planning relates to the government's role in protecting the public's health, safety, and welfare. County and local jurisdictions' growth policy plans, zoning ordinances, and subdivision regulations 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 impact the use of another. For instance, industrial uses

are often separated from residential uses to avoid impacts related to noise, odors, lighting, etc. The following Land Use issues were identified:

- **Leasing underutilized properties at Ellsworth AFB.** Underutilized property at Ellsworth AFB creates opportunities for land to be leased out.
- **SDEDA land acquisition concerns.** There is concern about property maintenance and future uses on SDEDA owned properties.

Roadway Capacity

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

The South Dakota Department of Transportation (SD DOT), in conjunction with the City of Box Elder, the Rapid City Area MPO, and the Federal Highway Administration are conducting a comprehensive traffic study on I-90, from Exit 61 to Exit 67 Corridor. It is important to convey to the traffic study consultants / participants to carefully consider the 2008 AICUZ guidelines, especially the traffic flows that may impact current or future base operations, mission capabilities, and mission growth / expansion.

The following Roadway Capacity issue was identified:

- **Commercial traffic nearby Ellsworth AFB Commercial Gate.** Commercial traffic on Box Elder roads causes road damage.

Water Quality / Quantity

Water quality / quantity concerns include the assurance that adequate water supplies of good quality are available for use by the installation and surrounding communities as the area develops. Water supply for agriculture and industrial use is also considered. The following Water Quality / Quantity issue was identified:

- **Golf course water supply.** There is no guaranteed water supply available to irrigate Prairie Ridge Golf Course.

Please see the next page.



Implementation Plan

This chapter identifies and organizes the recommended courses of action (strategies) that have been developed through a collaborative effort between representatives of local jurisdictions, Ellsworth AFB, state and federal agencies, local organizations, the general public and other stakeholders that own or manage land or resources in the region. Because the Ellsworth AFB JLUS is the result of a collaborative planning process, the strategies represent a true consensus plan; a realistic and coordinated approach to compatibility planning developed with the support of stakeholders involved throughout the process.

The JLUS strategies incorporate a variety of actions that promote compatible land use and resource planning. Upon implementation, existing and potential compatibility issues arising from the civilian / military interface can be removed or significantly mitigated. The recommended strategies function as the heart of the JLUS document and are the culmination of the planning process.

Each of the JLUS strategies that are included in this chapter are meant to address specific compatibility issues that are described in greater detail in Chapter 5 of the Ellsworth AFB JLUS Background Report. The issues are included before each set of strategies as a point of reference to what the strategies are addressing. They correspond to the issue numbers in the Chapter 5 of the Background Report for easy reference and can be used to read additional information on the specifics of the issues themselves.

The key to the implementation of strategies is the establishment of the JLUS Coordination Committee (see Strategy COM-1A) to oversee the execution of the JLUS. Through this committee, local jurisdictions, Ellsworth AFB, and other interested parties can continue their collaboration to establish procedures, recommend or refine specific actions, and make adjustments to strategies over time to ensure the JLUS continues to resolve key compatibility issues into the future through realistic strategies and implementation.

It is important to note that the JLUS is not an adopted plan, but rather a recommended set of strategies which should be implemented by the JLUS participants in order to address current and potential future compatibility issues.

Implementation Plan Guidelines

The key to a successful plan is balancing the different needs of all involved stakeholders. To produce a balanced plan, several guidelines were used as the basis for strategy development. These guidelines included:

- Recommended strategies must not result in a taking of property as defined by state law.
- In some cases, the recommended strategies can only be implemented with new enabling legislation.
- In order to minimize regulation, many of the strategies are only recommended within the certain geographic area for which the issue they address occurs (e.g. within the noise contours), instead of recommended for the entire JLUS Study Area.
- Similar to other planning processes that include numerous stakeholders, the challenge is to create a solution or strategy that meets the needs of all parties. In lieu of eliminating strategies that do not have 100 percent buy-in from all stakeholders, it was determined that multiple strategies may be needed to address an issue to allow for a tailored to individual circumstances.
- Since this JLUS is meant to be a “living document”, and state and federal regulations are subject to change, before implementing one of the suggested strategies included in the Implementation Plan, the implementing jurisdiction or party should ensure there is no conflict between the strategy and any existing state or federal law.

Military Compatibility Areas

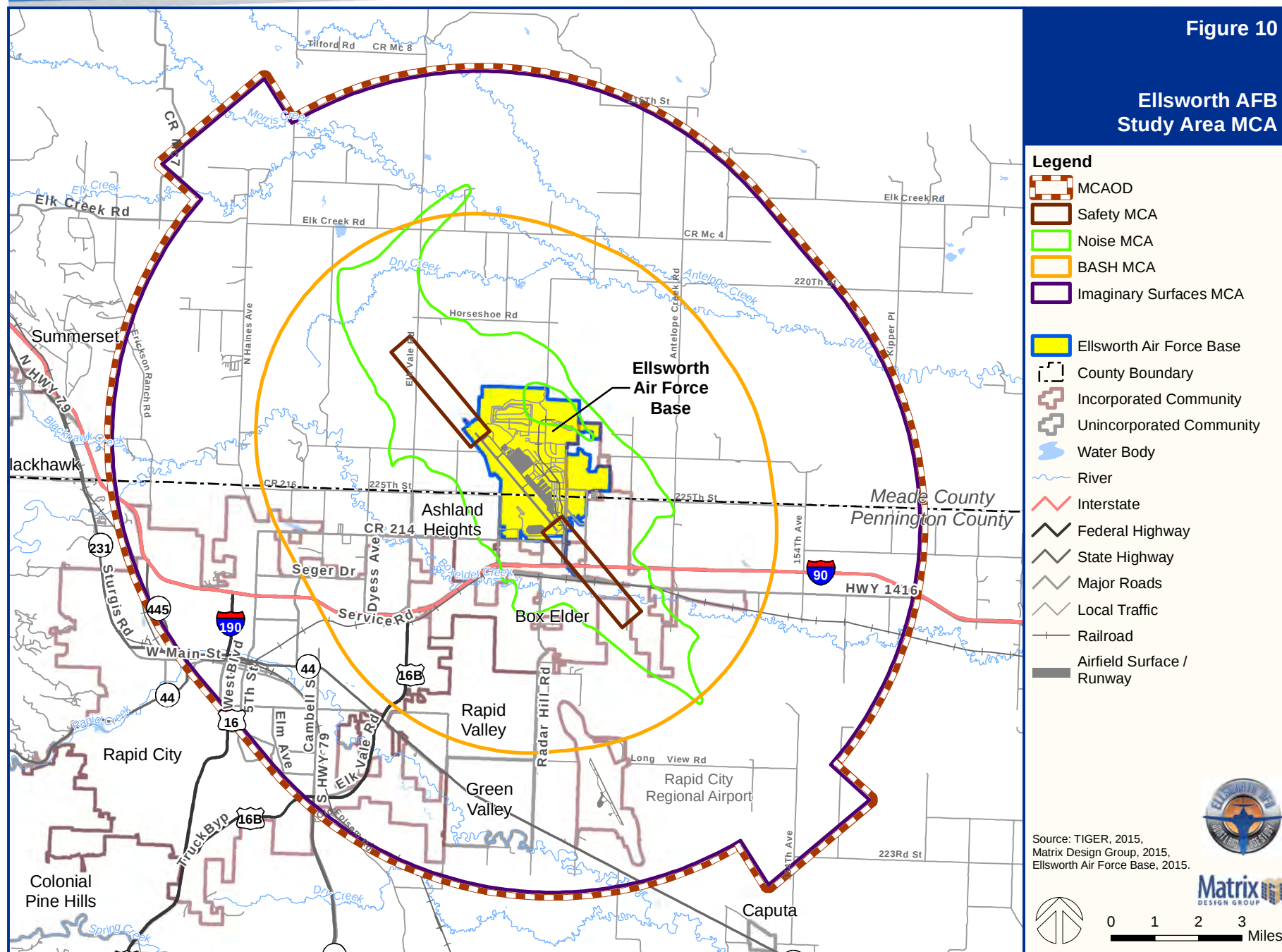
In compatibility planning, the generic term “Military Compatibility Area” (MCA) is used to formally designate a geographic area where military operations may impact local communities, and conversely, where local activities may affect the military’s ability to carry out its mission(s). An MCA is designated to accomplish the following:

- Promote an orderly transition between community and military land uses so that land uses remain compatible.
- Protect public health, safety, and welfare.
- Maintain operational capabilities of military installations and areas.
- Promote an awareness of the size and scope of military training areas to protect areas separate from the actual military installation (e.g., critical air space) used for training purposes.
- Establish compatibility requirements within the designated area, such as requirements for sound attenuation or aviation easements.

The MCAs are used to define the geographic areas where the JLUS strategies are to be applied. This technique ensures the strategies are applied to the appropriate areas, and that locations deemed not subject to a specific compatibility issue are not adversely impacted by regulations inappropriate for their location or circumstance.

These MCAs are recommended under Strategy LU-3A.

Figure 10

Ellsworth AFB
Study Area MCA

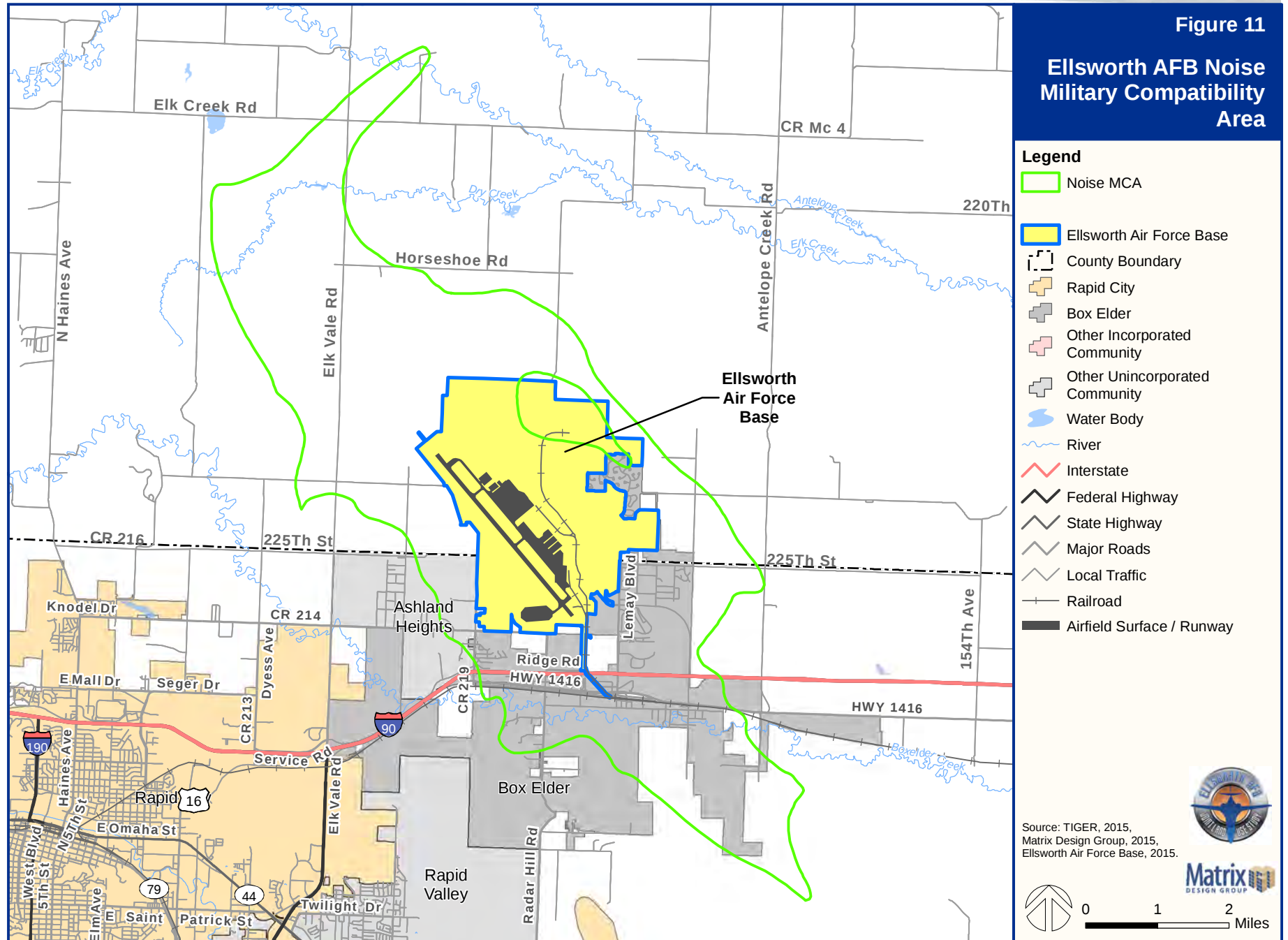
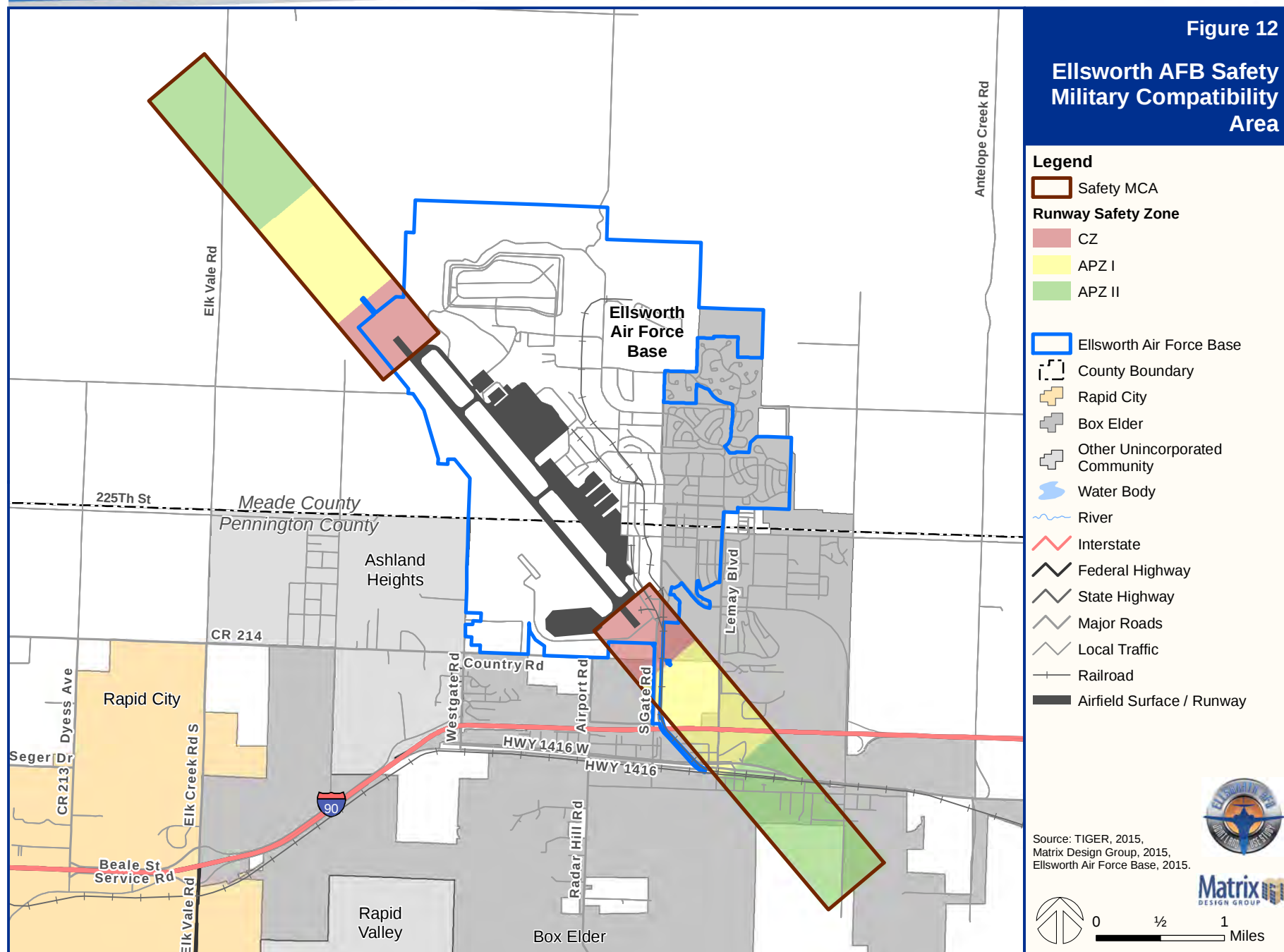


Figure 12

Ellsworth AFB Safety Military Compatibility Area



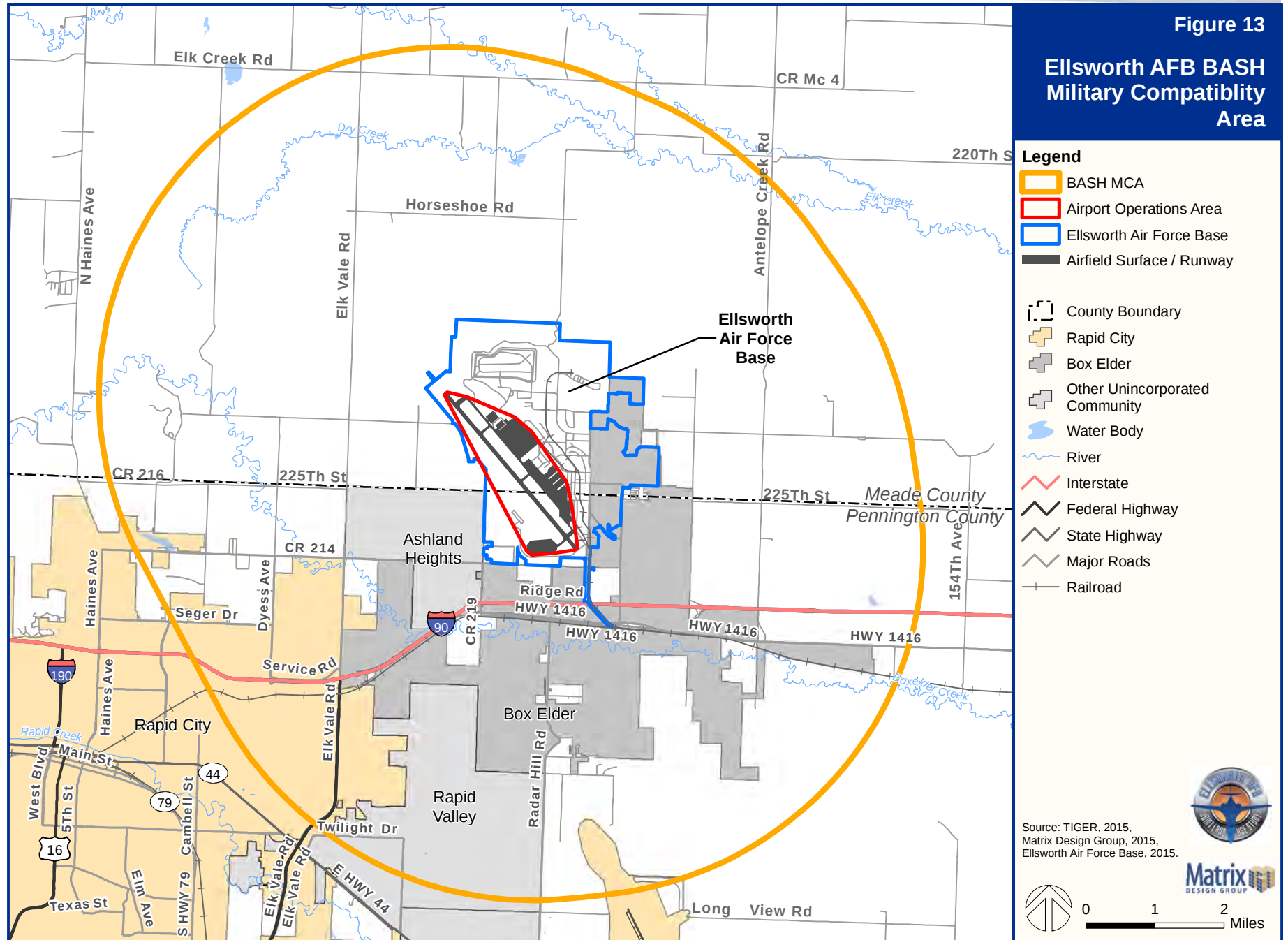
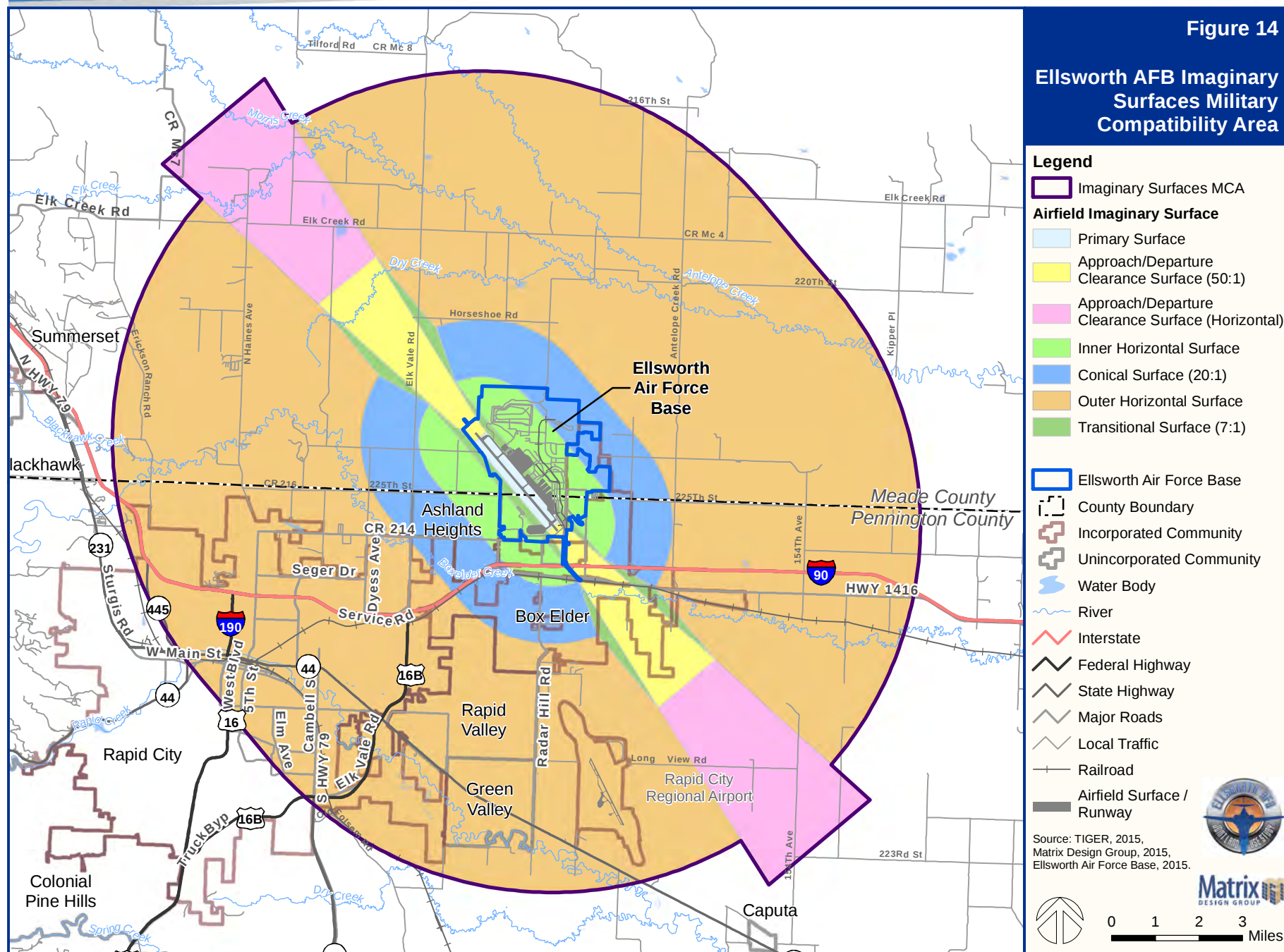


Figure 14

Ellsworth AFB Imaginary Surfaces Military Compatibility Area



Study Area MCA (Figure 10)

The Study Area MCA is an area that incorporates all other MCAs and covers the area shown on Figure 10. This is the same area used in the JLUS documents as the JLUS Study Area. The individual MCAs that helped define the overall Study Area are shown on Figures 11 through 14.

Noise MCA (Figure 11)

Noise is often a concern to the public surrounding military installations that practice flying missions. The Noise MCA includes all land located off-installation within 65 decibels (dB) day-night sound level (DNL) and up to 80 dB DNL. The 80 dB DNL is the “loudest” contour line computed and 65 dB DNL is the “quietest”. These contours are derived from the DOD NOISEMAP program.

Residential developments and other noise-sensitive land uses within this MCA may be subjected to sound attenuation measures to reduce interior noise impacts and to achieve a maximum interior noise level of 45 dB DNL.

Without a requirement for sound attenuation via building code requirements, certain uses such as residential, and those that congregate large groups, including schools, healthcare facilities, and churches, are not compatible within areas that experience noise levels of 65 dB DNL or greater. Uses that are compatible within airport noise contours are office / retail and manufacturing / industrial when interior noise levels are less than 70 dB DNL. Local building codes can be used to ensure that noise attenuation measures are incorporated in all new development within the Noise MCA

Safety MCA (Figure 12)

The proposed Safety MCA would regulate compatible land use types and densities / intensities within the Clear Zones (CZs) and Accident Potential Zones (APZs) I and II of Ellsworth AFB’s runway. Each of these would be a subzone of the Safety MCA. The location of each safety subzone is based on the airfield layout and air operations identified in Ellsworth AFB’s AICUZ Report.

A Safety MCA is needed to prevent incompatible land use developments in areas with the greatest potential for an accident. These safety zones were identified as a result of the Air Force’s guidance that defines APZs as areas where an aircraft accident is most likely to occur. The APZs follow the flight patterns of departing and arriving planes and are based upon analysis of historical data.

Accident Potential Zone Subzone

Within the CZ, most types of land use are incompatible with aircraft operations. Thus, it is recommended that no development be located within CZs. Compatibility guidelines prevent land uses that require large numbers of people (such as residences, apartments, hospitals, churches, and schools) from being constructed within the APZs. While the likelihood of an accident is minimal, the Air Force recommends low density land uses within the APZs to ensure the maximum protection of public health and property.

Low density single family residential uses (1 to 2 units per acre) can be compatible when located within APZ II. Other generally compatible uses include agriculture, limited intensity office / retail, and light industrial.

The CZ is the area that begins at each end of the runway. At Ellsworth AFB, the Runway 13/31 CZ measures 3,000 feet wide by 3,000 feet long. This is the area that has the highest potential of an aircraft incident.

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

BASH MCA (Figure 13)

The proposed Bird / Wildlife Aircraft Strike Hazard (BASH) MCA extends from the airport operational area of Ellsworth AFB for a radius of 5 miles. The BASH MCA is meant to include areas near the airfield that have the highest safety concerns if concentrations of birds or bird-attractant uses were

located there. Bird strikes with aircrafts can have serious safety concerns, including the large-scale damage to aircrafts or potentially the loss of life. Even minor bird strikes can end with costly repairs to aircrafts and interfere with training missions. The 5-mile distance associated with the BASH MCA is a Federal Aviation Administration (FAA) recommended standard for managing bird attractants around runways.

Vertical Obstructions MCA (Figure 14)

The purpose of the Imaginary Surfaces MCA is to regulate the height of all structures and buildings within the area defined by FAA guidance and Air Force AICUZ instructions known as imaginary surfaces. The imaginary surfaces are a 3-D geographic area comprising approach and departure airspace corridors and safety buffers. Vertical obstruction heights constitute a major concern for flight training and operations due to the potential for a structure to extend into navigable airspace. This could impede safe flight operations and put both pilots and citizen at risk of an aircraft accident. Vertical obstructions that can affect flight safety include cell towers, power lines, wind turbines, buildings, and trees. Imaginary surfaces are explained in more detail in Chapter 3, Ellsworth AFB Military Profile in the Background Report.

How to Read the Implementation Plan

The strategies are designed to address the issues identified during preparation of the JLUS. The purpose of each strategy is to:

- avoid future actions, operations, or approvals that would cause a compatibility issue;
- eliminate or reduce the adversity of existing compatibility issues where possible, and
- provide for enhanced and on-going communications and collaboration.

To make the strategies easier to use, they are presented in a table format that provides the strategy and information on when and how that strategy will be implemented. The strategies are arranged in a table to correspond with their compatibility factor. The issue within each factor is presented first to provide a linkage between the strategy and the condition it is intended to resolve or minimize. Figure 15, How to Read JLUS Strategies, highlights the format and content of the strategy table. The following paragraphs provide an overview of how to read the information presented for each strategy in the table.

Issue or Strategy #. The issue # and strategy # are unique alpha-numeric numbers that provide a reference for each specific issue and strategy. A strategy's reference number is composed of the Compatibility Issue number and this ID (e.g., COM-1, COM-1B, etc.).

Military Compatibility Area (MCA). This column indicates the applicable MCA in which the strategy should be applied, or if the strategy relates to the whole JLUS Study Area. The MCA geographies for the Ellsworth AFB strategies are defined in Strategy LU-3A. Some of the strategies are designated as "General", meaning that they do not have a specific geography associated with them.

Strategy. In bold type is a title that describes the strategy. This is followed by the complete strategy statement that describes the recommended action.

Timeframe. This column indicates the projected timeframe of each strategy. The timeframes describe the year in which a strategy will be initiated or if it is an on-going action.

Short-Term	Strategy proposed for initiation in 2016 / 2017 (within year of JLUS completion)
Mid-Term	Strategy proposed to be initiated in 2018 / 2019 (within 1-2 years of JLUS completion)
Long-Term	Strategy proposed to be initiated in 2020 / 2022 (3 to 5 years from JLUS completion)
On-going	An on-going implementation action

Responsible Party. At the right end of the strategy table are a series of columns, one for each jurisdiction, military entity, agency, and organization with responsibility for implementing the JLUS strategies. If an entity has responsibility relative to implementing a strategy, a mark is shown under their name. This mark is one of two symbols that represent their role. A solid square (■) designates that the entity identified is responsible for implementing the strategy. A hollow square (□) designates that the entity plays a key supporting role, but is not directly responsible for implementation. The responsible parties are identified by their name or assigned acronym in the heading at the top of each page.

Figure 15. How to Read JLUS Strategies

Issue / Strategy ID	MCA	Issue / Strategy	Timeframe	Meade County	Pennington County	City of Box Elder	City of Rapid City	SDEDA	Ellsworth AFB	Other
AIR QUALITY (AQ)										
AQ-1	Regional Air Quality Rapid City was not in attainment for particulate matter (PM1) about 10 years ago, but achieved attainment and needs to stay in attainment									
AQ-1A	Study Area MCA	Update South Dakota Ambient Air Monitoring Plan The South Dakota Department of Environment and Natural Resources (DENR) should update the South Dakota Ambient Air Monitoring Plan to incorporate performance metrics for maintaining attainment in this area. In addition, DENR should work with Ellsworth AFB to understand the potential limitations that could be imposed on the base should the area become nonattainment. These limitations should be identified as air quality issues in the Plan. Other Partner: South Dakota DENR	Mid-term						□	■
AQ-1B	Study Area MCA	Update Plans to Incorporate Military Compatibility The South Dakota DENR should update all of its plans to incorporate military compatibility guidelines and identify certain military base operations as sources of air pollution that should be accounted for in the plans. This comprehensive approach will facilitate ongoing collaboration between the state and the military in these matters and enable a comprehensive set of actions that can assist all stakeholders in this area to maintain the attainment status. The plans include the South Dakota Ambient Air Monitoring Plan, the Natural Event Action Plan, and any other relevant plans. Other Partner: South Dakota DENR	Mid-term							■

Issue or Strategy ID Number: Alpha-numeric identifier used for reference.

MCA: The MCA in which each strategy applies.

Strategy: Description of the strategy.

Timeframe:
Year in which each strategy should be initiated.

- Short (start 2016 / 2017)
- Mid (start 2018 / 2019)
- Long (start 2020 – 2022)
- On-going

Responsible Party:
The primary and partner responsible agencies. For example, the ■ denotes a primary agency who will take the lead in implementation. The □ denotes a partner agency who will assist the primary agency in implementation

Jurisdictions / Agencies

Compatibility Factor

Issue Statement

Issues / Strategies by Compatibility Factor (Alphabetized by Factor)

Issue / Strategy ID	MCA	Issue / Strategy	Timeframe	Meade County	Pennington County	City of Box Elder	City of Rapid City	SDEDA	Ellsworth AFB	Other
AIR QUALITY (AQ)										
AQ-1	Regional Air Quality Rapid City was not in attainment for particulate matter (PM1) about 10 years ago, but achieved attainment and needs to stay in attainment									
AQ-1A	Study Area MCA	Update South Dakota Ambient Air Monitoring Plan The South Dakota Department of Environment and Natural Resources (DENR) should update the South Dakota Ambient Air Monitoring Plan to incorporate performance metrics for maintaining attainment in this area. In addition, DENR should work with Ellsworth AFB to understand the potential limitations that could be imposed on the base should the area become nonattainment. These limitations should be identified as air quality issues in the Plan. Other Partner: South Dakota DENR	Mid-term						☐	☒
AQ-1B	Study Area MCA	Update Plans to Incorporate Military Compatibility The South Dakota DENR should update all of its plans to incorporate military compatibility guidelines and identify certain military base operations as sources of air pollution that should be accounted for in the plans. This comprehensive approach will facilitate ongoing collaboration between the state and the military in these matters and enable a comprehensive set of actions that can assist all stakeholders in this area to maintain the attainment status. The plans include the South Dakota Ambient Air Monitoring Plan, the Natural Event Action Plan, and any other relevant plans. Other Partner: South Dakota DENR	Mid-term							☒
AQ-1C	Study Area MCA	Update Fugitive Dust Control Plan Pennington County should update its Fugitive Dust Control Plan to reflect currently technology in dust control measures and to incorporate coordination with Ellsworth AFB.	Mid-term		☒					

Issue / Strategy ID	MCA	Issue / Strategy	Timeframe	Meade County	Pennington County	City of Box Elder	City of Rapid City	SDEDA	Ellsworth AFB	Other
AQ-1D	Study Area MCA	Air Quality Monitoring Air quality needs should be assessed on a continual basis to prevent air quality from becoming an issue in the future and to enact long term preventive measures by maintaining awareness of the different categories of pollutants.	On-going	■	■	■	■		■	
AQ-1E	Study Area MCA	Air Quality Partnerships The JLUS Study Area communities should coordinate with Ellsworth AFB to develop an air quality working group (this could be part of the JLUS Coordination Committee (see Strategy COM-1A) to enhance partnerships on air quality issues and develop programs for reducing emissions and maintaining levels of attainment.	Mid-term	■	■	■	■	■	■	
ANTI-TERRORISM / FORCE PROTECTION (AT)										
AT-1	Potential Observation at the Commercial Gate Development of private property near the Commercial Gate may require siting and screening guidance to reduce visualization of the gate area.									
AT-1A	Study Area MCA	Self-Policing Brochures Develop and distribute self-policing informational brochures to be available at government offices and on websites.	Short-term	□	□	□	□		■	
AT-1B	Study Area MCA	Eagle Eye Training Program Ellsworth AFB should volunteer or consider using P4 (Public-Public, Public-Private) initiatives to train and educate local law enforcement agencies about the US Air Force Eagle Eyes Program to increase the skills of the local law enforcement agencies in how to recognize suspicious behavior, how to act, and who to inform in the event of suspicious behavior, and thus increase skilled-vigilance around the base.	Short-term	□	□	□	□		■	
AT-1C	Study Area MCA	Develop an “Eyes on Ellsworth” Program Engage local community groups and jurisdictions to work with law enforcement agencies to create a voluntary vigilance program, whereby citizens and public safety officers that observe suspicious behavior around the commercial gate entrance or any area near the perimeter of the base, and inform a designated point of contact at Ellsworth AFB.	Short-term	□	□	□	□		■	

Issue / Strategy ID	MCA	Issue / Strategy	Timeframe	Meade County	Pennington County	City of Box Elder	City of Rapid City	SDEDA	Ellsworth AFB	Other
AT-1D	Study Area MCA	Landscaping to Provide Barrier for Base As part of future development near the Commercial Gate that may have a view of this gate, projects should be required to install and maintain landscaping suitable for visual screening.	Mid-term		■	■				
AT-2	Potential for Observation in Sensitive Areas North and West of Ellsworth AFB Sensitive areas outside of the northwest area of the base could be developed, creating security concerns.									
AT-2A	Study Area MCA	Identify Locations of Critical Parcels Ellsworth AFB should develop a list of parcels that, if developed, could allow viewing into the base. This list should be used by South Dakota Ellsworth Development Authority (SDEDA) and others to obtain development restrictions on these parcels.	Short-term		□	□		□	■	
AT-2B	Study Area MCA	Continue to Pursue Readiness Environmental Protection Integration Opportunities The SDEDA should continue to work with Ellsworth AFB and willing landowners to acquire priority parcels or development rights of parcels outside the base using the REPI tool to provide a measure of protection for the base and public. Other Partner: Willing landowners	On-going					■	■	□
AT-2C	Study Area MCA	Incorporate and Budget for AT / FP Design Standards, Stand-Off Distances, and Adequate Perimeter Fence in Installation Plans Utilize, incorporate, and budget for the AT / FP unified facilities criteria using DoD minimum standards for construction of installation perimeter fence (especially in areas where the fence is sub-standard construction or in need of repairs), with appropriate stand-off distances.	Mid-term						■	
AT-3	Wagon Wheel Encroachment Wagon Wheel homes are located within 10 feet of the Ellsworth AFB primary fence line, which could facilitate unauthorized access to the installation.									
AT-3A	Study Area MCA	Incorporation into Box Elder The City of Box Elder should continue to evaluate the ability to incorporate this area to ensure future changes at this site are subject to the City's ordinances and regulations.	On-going	□	□	■			□	

Issue / Strategy ID	MCA	Issue / Strategy	Timeframe	Meade County	Pennington County	City of Box Elder	City of Rapid City	SDEDA	Ellsworth AFB	Other
AT-3B	Study Area MCA	Install and Monitor Signage Ellsworth AFB should install, if not already done, signage along this area where the Wagon Wheel Trailer Park is located to remind the public that Ellsworth AFB is an active military installation and trespassing of any kind is a security risk. Ellsworth AFB should work with the Meade County Sheriff's Office to monitor this area to ensure the signage is not vandalized or stolen. If the signage is stolen or vandalized, then a reporting process should be developed and enabled to repair or replace signage along this area of fence line. Other Partner: Meade County Sheriff's Office	On-going						☒	☐
BIOLOGICAL RESOURCES (BIO)										
BIO-1	Sensitive Species Exist on Installation Sensitive species on the installation, and the habitats that support them, warrant special care during siting and new construction activities on base to minimize habitat disturbance.									
BIO-1A	Study Area MCA	Coordinate the Protection and Conservation of Sensitive Species The South Dakota DENR should continue to coordinate with US Fish and Wildlife Service (USFWS) and Ellsworth AFB for the management of the conservation sensitive species to enable protection of a the species and undeterred / unimpeded military training operations. Attention should be taken to habitat loss in the region to ensure that Ellsworth is not unduly burdened with habitat protection due to habitat destruction elsewhere in the region. Other Partners: South Dakota DENR, USFWS	On-going						☐	☒
BIO-1B	Study Area MCA	Develop Conservation of Sensitive Species Management Plan The South Dakota DENR, USFWS, and Ellsworth AFB should collaborate to develop and fund an appropriate management plan for the conservation of sensitive species that are found on Ellsworth AFB. Any agreed upon strategies should be incorporated into an update of the installation's Integrated Natural Resources Management Plan (INRMP). Other Partners: South Dakota DENR, USFWS	Mid-term							☒

Issue / Strategy ID	MCA	Issue / Strategy	Timeframe	Meade County	Pennington County	City of Box Elder	City of Rapid City	SDEDA	Ellsworth AFB	Other
BIO-1C	Study Area MCA	Update Integrated Natural Resources Management Plan Ellsworth AFB should consider updating the INRMP to incorporate actions and measures to protect the non-listed federal and state species, but conservation of sensitive species to ensure protection of a species and preventing delay, postponement, or cancelation of military training operations due to these species' status in the future. The update should also assess measures to protect owl populations and manage and reduce prairies dog populations that threaten the owls.	Mid-term						■	
COORDINATION / COMMUNICATION (COM)										
COM-1	Regional Cooperation and Coordination Improve and formalize cooperation and relationships with the Rapid City Area Metropolitan Planning Organization (MPO) and jurisdictions, SDEDA, and Ellsworth AFB.									
COM-1A	Study Area MCA	Establish a JLUS Coordination Committee Establish a JLUS Coordination Committee to maintain efficient and effective coordination among the JLUS partners, oversee the implementation of JLUS recommendations, and enhance long-term coordination on military compatibility issues. This function can be integrated into another advisory committee, such as the MPO, as appropriate to the area and issues addressed. This committee should build off the efforts of the Moving Forward with Ellsworth Air Force Base (MFWE). The JLUS Coordination Committee should meet on a regular basis as agreed upon by the Committee. Other Partners: other agencies, departments, or entities deemed relevant and interested in participating.	Short-term	■	■	■	■	■	■	■

Issue / Strategy ID	MCA	Issue / Strategy	Timeframe	Meade County	Pennington County	City of Box Elder	City of Rapid City	SDEDA	Ellsworth AFB	Other
COM-1B	Study Area MCA	Develop Memorandum of Understanding (MOU) The Rapid City Area Metropolitan Planning Organization (MPO) should collaborate through the JLUS Coordination Committee to facilitate the development of a formal MOU that delineates the roles and responsibilities for each agency in the JLUS Study Area. This MOU should contain information such as: ■ Point of Contact and contact information for each agency, ■ Role in addressing compatibility issues with the base, ■ Responsibility in addressing compatibility issues, ■ Community and military response times, and ■ Triggers for coordination and communication, e.g., infrastructure planning, water resources planning, economic development, etc. Other Partners: Rapid City Area MPO and COG	Short-term	■	■	■	■	■	■	■
COM-1C	Study Area MCA	Create and Maintain a GIS Data Clearinghouse The jurisdictions in the JLUS Study Area, Rapid City MPO, federal and state agencies, and Ellsworth AFB should work collaboratively to develop a GIS clearinghouse to share GIS data (e.g., military footprints, comprehensive plan information) to enable enhanced long-range compatibility planning. In addition, a protocol for accessing and updating the information should be developed to ensure accuracy and appropriate security measures are established. Other Partners: Rapid City MPO and COG	Mid-term	■	■	■	■	■	■	■
COM-1D	Study Area MCA	Ellsworth AFB Technical Support to Local Jurisdictions The Ellsworth AFB Community Planner or Civil Engineer or other appropriate representative, when appropriate and available, should be available to support local planning commissions in each jurisdiction (and other advisory boards, as appropriate) within the Study Area by attending meetings and be available to answer questions relative to applications or plans that may affect operations associated with Ellsworth AFB.	On-going	□	□	□	□		■	

Issue / Strategy ID	MCA	Issue / Strategy	Timeframe	Meade County	Pennington County	City of Box Elder	City of Rapid City	SDEDA	Ellsworth AFB	Other
COM-1E	Study Area MCA	Early Development Application Review Consider establishing an MOU between Ellsworth AFB and the jurisdictions, formalizing a process that provides copies of all conditional use, master plan, subdivision, annexation, etc. submittals located within the MCOD to be reviewed by Ellsworth AFB. Such review periods shall conform to existing community review periods for comment. This supports a proactive approach to identifying potential conflicts early in the proposed development application phase. The MOU should include: ■ Provide technical input and assistance to local jurisdictions to support discussion of projects and potential compatibility issues, ■ Definition of project types that require review, ■ Identification of the Points of Contact for all coordination, ■ Identify opportunities for appropriate Ellsworth AFB personnel to participate in pre-application meetings for significant projects, ■ Establish a formal procedure for requesting and receiving comments, ■ Establish a standard, maximum timeline for responses, keeping in mind mandated review time periods as specified by State law and local procedures, and ■ Provide notice to the Ellsworth AFB on all public hearings regarding projects identified for coordination While consultation is expected to occur primarily on projects in the defined Study Area MCA, the military / Ellsworth AFB should establish contacts and procedures for receiving notices and review opportunities on significant regional projects. Other Partners: COGs, school districts	On-going	■	■	■	■		■	□

Issue / Strategy ID	MCA	Issue / Strategy	Timeframe	Meade County	Pennington County	City of Box Elder	City of Rapid City	SDEDA	Ellsworth AFB	Other
COM-1F	Study Area MCA	Review of Military Planning Documents Ellsworth AFB should provide public versions of key planning documents for review and comment prior to finalization and ensure each member of the JLUS Coordinating Committee receives a copy for review. Key planning documents could include the following (list to be finalized by the JLUS Coordination Committee and Ellsworth AFB) (see Strategy COM-1A): ■ AICUZ and other noise studies ■ Other documents as appropriate, and when agreed to be used for official use only	On-going	☐	☐	☐	☐	☐	☒	
COM-2	Need for Improved Public Communication and Transparency of South Dakota Economic Development Authority Operations The general public in Box Elder needs to better understand the operations of South Dakota Economic Development Authority (SDEDA) relative to their compatibility actions (land purchase, maintenance and use).									
COM-2A	Study Area MCA	Informational Brochures The SDEDA should consider developing informational brochure about their roles and responsibilities and capabilities as an EDA. These brochures should be made available at all jurisdictional offices and online for download. Such information should include but not be limited to: ■ Points of contact of the SDEDA staff, ■ Current projects, ■ Types of projects ■ How the public can get involved / opportunities for public involvement, and Mission and vision of the organization	Short-term	☐	☐	☐	☐	☒		
COM-2B	Study Area MCA	Host Meet and Greet Events The SDEDA should consider hosting meet and greet events for the public to come and meet the SDEDA staff and ask questions of the staff about what the organization mission is and how the public can get involved in the mission. These meet and greets should be well advertised.	On-going					☒		

Issue / Strategy ID	MCA	Issue / Strategy	Timeframe	Meade County	Pennington County	City of Box Elder	City of Rapid City	SDEDA	Ellsworth AFB	Other
COM-3		Better Communication Regarding Special Events on Base There is a need for improved notification from the base for atypical operation events that result in increased noise or smoke.								
COM-3A	Study Area MCA	Establish Communication Procedures for Training that Occurs Outside the Routine Schedule Including Special Events Ellsworth AFB shall work with the JLUS jurisdictions and relevant agencies to establish procedures for coordination between the base and local jurisdictions / agencies relative to base operations and changes to operations and activities. This will include: ■ Define operations and changes in operations that warrant public knowledge, ■ Identify points of contact for all coordination, ■ Establish a formal procedure for providing advanced notice of special events,	Short-term	☐	☐	☐	☐	☐	☒	
COM-3B	Study Area MCA	Enhance Notifications to the Public for Where possible and able to be released to the public, Ellsworth AFB should enhance notification techniques and measures about training events that occur outside or in addition to the normal training schedule and other current events that are relevant to the citizens. Notifications should be available during all times of the day. Include a point of contact in all notifications. Notification techniques should include but not be limited to: ■ Ellsworth AFB Facebook / Twitter ■ Public Service Announcements ■ Ellsworth AFB newspaper and other local newspapers ■ Links from jurisdiction websites to the Ellsworth AFB website ■ Group Email Blast to jurisdiction's elected and appointed officials, public affairs office, and public safety officers	On-going						☒	
COM-3C	Study Area MCA	Encourage Use of Media Methods to Disseminate Information Ellsworth AFB should continue use media releases and distribute to local media outlets about activities or operations that will generate atypical noise, dust/smoke, or other planned special events. This information should be made available on the Air Force's website and through other jurisdictions' public service announcement and media outlets methods.	On-going	☐	☐	☐	☐	☐	☒	



Issue / Strategy ID	MCA	Issue / Strategy	Timeframe	Meade County	Pennington County	City of Box Elder	City of Rapid City	SDEDA	Ellsworth AFB	Other
COM-3D	Study Area MCA	Maintain and Continue to Utilize Social Media Ellsworth AFB should utilize the Ellsworth AFB Facebook and Twitter pages and other social media outlets as appropriate to disseminate information about base activities, especially those activities that generate atypical noise, dust/smoke, or other special events. Include point of contact at the base for questions or concerns.	On-going						■	
DUST / SMOKE / STEAM (DSS)										
DSS-1	Smoke from Ellsworth AFB Operations Smoke from prescribed burns or fire training activities at Ellsworth AFB can impact pilot visibility and off-site activity.									
DSS-1A	Study Area MCA	Fire Control Plan Prescribed burns or operations at the Explosive Ordnance Disposal (EOD) areas on Ellsworth should not be conducted when wind speeds exceed established Air Force standards. Appropriate fire protection systems shall be on-site during operations that could create a wildfire, and local emergency responders will be notified in advance of such planned events on base. Integrate the new wildland fire prevention team for prescribed fires.	On-going						■	
DSS-1B	Study Area MCA	Coordination Regarding Dust/Smoke Inducing Operations Notify and educate the public about the purpose of prescribed burns and EOD and when they will be occurring.	On-going						■	
ENERGY DEVELOPMENT (ED)										
ED-1	Wind Energy Development Wind energy potential in the region could attract wind energy generation development near Ellsworth AFB and flight operation areas.									
ED-1A	Study Area MCA	Update Comprehensive Plans for Military Compatibility The JLUS jurisdictions should consider updating their comprehensive plans to incorporate military compatibility policies for the renewable energy development industry to ensure the jurisdictions and other relevant agencies are included in potential development discussions. Ellsworth AFB should be included in any commercial wind development application review.	Mid-term	■	■	■	■		□	

Issue / Strategy ID	MCA	Issue / Strategy	Timeframe	Meade County	Pennington County	City of Box Elder	City of Rapid City	SDEDA	Ellsworth AFB	Other
ED-1B	Study Area MCA	Amend Zoning Ordinances for Military Compatibility The JLUS jurisdictions should consider amending their zoning ordinances to incorporate military compatibility guidelines for the renewable energy development industry to ensure the jurisdictions, other relevant agencies, and Ellsworth AFB are included in potential development discussions.	Mid-term		■	■	■		□	
ED-1C	Study Area MCA	Coordinate with DOD Siting Clearinghouse The DOD Siting Clearinghouse requirements and standards published in Title 32, Code of Federal Regulations, Part 211 shall advise and guide the process to facilitate the early submission of renewable energy project proposals to the Clearinghouse for military mission compatible review. Applicable local planning documents (general plans, regional plans, and renewable energy regulations) should be amended to incorporate policies and procedures for coordinating alternative energy development applications with the DOD Siting Clearinghouse.	On-going	■	■	■	■			
ED-1D	Study Area MCA	Coordinate with FAA Regulations Wind energy developments should be coordinated with FAA height regulations.	On-going	■	■	■	■			
HOUSING AVAILABILITY (HA)										
HA-1	Affordable Housing Median values and rents of homes are increasing in the area, while changes in military housing have altered housing availability for military personnel and local residents.									
HA-1A	Study Area MCA	Create a Community-Military Housing Subcommittee Through the JLUS Coordination Committee, a community-military housing subcommittee should be created to assess the housing needed for military personnel and families. The subcommittee should work closely with planned efforts by the City of Box Elder to develop a housing study that would identify deficient housing, inventory existing housing, and identify blighted and substandard housing. The subcommittee should also look into the housing data base that is conducted by the Air Force Market Survey. The subcommittee should also assess the availability of various types of housing including affordable, transient housing agreements with apartments, e.g. shorter lease agreements for	Short-term	□	□	□	□	□	■	■



Issue / Strategy ID	MCA	Issue / Strategy	Timeframe	Meade County	Pennington County	City of Box Elder	City of Rapid City	SDEDA	Ellsworth AFB	Other
		military personnel. This subcommittee membership should include representatives for local real estate commissions and organizations. Other Partner: JLUS Coordination Committee								
HA-1B	Study Area MCA	Develop Housing Needs Information Ellsworth AFB should develop and maintain general information on housing needs for base personnel (military and civilian) that can be used to identify housing needs. Ellsworth AFB should support this effort by creating and maintaining a general database that identifies the number of personnel (military and civilian) within a community or community area (but not by address so that no personal information or specific locations are identified).	Short-term						■	
HA-1C	Study Area MCA	Update Housing Plans. The jurisdictions in the JLUS Study Area should update the housing elements within their comprehensive plans to account for the demand from Ellsworth AFB personnel and military families who live in the local communities and respond to any specialized needs of this group.	Long-term	■	■	■	■		□	
INFRASTRUCTURE EXTENSIONS (IE)										
IE-1	Power Lines Currently Limit the Expansion of Country Road in Pennington County There is a desire to expand Country Road 214, but the base fence line, power lines, and a contamination site is currently limiting the expansion.									
IE-1A	Study Area MCA	Remediation of Contaminated Site Ellsworth AFB should continue to evaluate the ability to remediate the area in question to the point that moving or infrastructure budget for and program the remediation of the contaminated site within the installation to allow for compatible growth on the outside of the installation. Ellsworth AFB should assess if public-public, public-private initiatives can be used as a funding mechanism to assist in funding the remediation of the contaminated site.	Long-term						■	

Issue / Strategy ID	MCA	Issue / Strategy	Timeframe	Meade County	Pennington County	City of Box Elder	City of Rapid City	SDEDA	Ellsworth AFB	Other
IE-2	Road Improvements in Meade County could Lead to Increased Residential Development The improvement of Meade County roads could lead to increased, and potentially incompatible, residential development in southern parts of Meade County.									
IE-2A	Study Area MCA	Coordination on Infrastructure Planning Notify and coordinate infrastructure expansion plans and building code requirements with the Public Works Department and Community Planner at Ellsworth AFB. When communities or other service providers move forward with any plans of extending infrastructure in the vicinity of Ellsworth AFB, such as a sewer extension or water redundancy, the Base should be notified. The coordination should be done early in the planning process to optimize compatibility and reduce costs associated with plan changes.	On-going	■	■	■	■		■	
IE-3	New Sewer Line could Lead to Increased Development A new sewer main on Dyess Avenue to Country Road could stimulate development of residential uses in areas with compatibility concerns.									
IE-3A	Study Area MCA	Communities should coordinate studies, design and construction of infrastructure improvements in order leverage resources, reduce duplication and promote development that is compatible with the mission of Ellsworth AFB.	On-going	■	■	■	■		■	
LAND / AIR / SEA SPACES (LAS)										
LAS-1	Non-military drones Non-military drones could interfere with military operations at Ellsworth AFB.									
LAS-1A	Study Area MCA	Enhance Awareness of Federal Unmanned Aerial System Regulation The jurisdictions should work with Ellsworth AFB and the FAA to enhance awareness of federal regulation regarding the use and operation of unmanned aerial systems (UASs). Awareness enhancements should include, but not be limited to: ■ Access to information available from the FAA at public locations ■ Links added to jurisdictional websites to FAA and National Conference of State Legislatures UAS websites including the proposed regulation site (http://www.ncsl.org/research/transportation/current-unmanned-aircraft-state-law-landscape.aspx) ■ Host public meetings about drones and their impacts on military training and	Short-term	□	□	□	□		■	□

Issue / Strategy ID	MCA	Issue / Strategy	Timeframe	Meade County	Pennington County	City of Box Elder	City of Rapid City	SDEDA	Ellsworth AFB	Other
		civilian / commercial aviation operations (invite a representative from one of the FAA test sites to speak on the issue). Tie with another event already planned. Other Partner: FAA								
LAS-1B	Study Area MCA	Develop Information on Usage Ellsworth AFB should work with the FAA to develop information on proper usage of drones near the base. Other Partners: FAA, Rapid City Propbuster	Short-term						■	□
LEGISLATIVE INITIATIVES (LEG)										
LEG-1	Multiple Jurisdictional Authority There are multiple jurisdictional authorities on Ellsworth AFB that place the area under legal jurisdiction of multiple authorities.									
LEG-1A	Study Area MCA	Develop Memorandum of Understanding (MOU) Ellsworth AFB should collaborate through the JLUS Coordination Committee to facilitate the development of a formal MOU that delineates the roles and responsibilities for each agency that manages land, resources or provides services on the installation. This MOU should be checked on every 3-5 years and should contain information such as: ■ Point of Contact and contact information for each agency, ■ Role in addressing compatibility issues with the base, ■ Responsibility in addressing compatibility issues, ■ Community and military response times, and ■ Triggers for coordination and communication, e.g., policing and security issues, infrastructure planning, water resources planning, economic development, etc. Other Partners: local law enforcement agencies, JLUS Coordination Committee	Short-term						■	■

Issue / Strategy ID	MCA	Issue / Strategy	Timeframe	Meade County	Pennington County	City of Box Elder	City of Rapid City	SDEDA	Ellsworth AFB	Other
LEG-1B	Study Area MCA	Develop a Resource Management Reference Guide Rapid City Area MPO, in cooperation with the JLUS partners, should develop a brief reference guide providing information about the various agencies in the JLUS Study Area with their respective responsibilities. This guide should be developed in a format that is easily posted to appropriate entity websites. It should be tailored to existing Air Force issues and contain a map(s) identifying the important resources in the area, and contact information for the agency representative that would help in cases of community-military compatibility. Other Partner: Rapid City Area MPO	Short-term	☐	☐	☐	☐	☐	☐	☒
LEG-1C	Study Area MCA	Enhance Awareness of the Jurisdiction Boundaries The City of Box Elder, Meade County, Pennington County, and Ellsworth AFB should work together to enhance awareness of the area that has been annexed by the City of Box Elder and that the need for public safety and emergencies should be managed by the City instead of by Ellsworth AFB. This enhancement should include, but not be limited to the following measures: ■ Delineation of points of contact for both the City of Box Elder and Ellsworth AFB ■ A map indicating where the boundary line is for the city's and base's jurisdictions ■ Notifications on jurisdictional websites and social media websites	Short-term	☒	☒	☒			☒	
LAND USE (LU)										
LU-1	Lack of Zoning in Meade County There are no zoning controls in Meade County surrounding the base, which could result in incompatible development within the noise contours or APZs.									
LU-1A Previous JLUS	Study Area MCA	Update Comprehensive Land Use Plan Meade County should update its comprehensive plan based on the land use recommendations contained in the Ellsworth AFB JLUS Report and consistent with AICUZ guidelines. The land use maps found within these documents should also reflect the noise contours.	Long-term	☒						



Issue / Strategy ID	MCA	Issue / Strategy	Timeframe	Meade County	Pennington County	City of Box Elder	City of Rapid City	SDEDA	Ellsworth AFB	Other
LU-1B	Study Area MCA	Amend Ordinance 34 Building Code and Construction Enforcement Meade County should amend Ordinance 34 Building Code and Construction Enforcement to include other measures for military compatibility, especially in noise zones. Such measures should include certain sound-proofing construction materials and various residential designs that locate noise sensitive rooms away from noise-prone areas.	Mid-term	■						
LU-2	Vacant School adjacent to Ellsworth AFB must be Redeveloped According to Compatibility with the AICUZ A vacant school nearby the Patriot Gate owned by Douglas Schools may be converted into a use that is incompatible with the existing Ellsworth AFB AICUZ.									
LU-2A	Study Area MCA	Early Coordination on Reuse Given the close proximity of this facility to the Ellsworth AFB gate, early coordination with the base should be conducted on any redevelopment or reuse concepts or applications for this site.	On-going			■		■	□	
		See Strategy COM-1E								
LU-3	Incompatible Development Near Ellsworth AFB Development in existing unincorporated areas could have compatibility issues depending on land use type and location. Potential infrastructure improvements may be growth inducing in areas near the base if not planned with compatibility in mind.									
LU-3A	Study Area MCA	Military Compatibility Areas (MCA)s with Subzones Jurisdictions should consider establishing MCAs with Subzones shown on Figures 10 through 14. The MCAs should be used by stakeholders to identify where, geographically, each recommended JLUS strategy should be applied. ■ Study Area MCA. This MCA covers regional strategies that apply to the JLUS Study Area as a whole. ■ Noise MCA. The area covers the areas under the noise contours of airfield that are subject to noise and will require varying noise attenuation standards in building construction of new structures or renovations of 51% or more. ■ Safety MCA. This MCA contains the area composed of the CZ and the APZs and the air operations area for bird strikes, and land uses will be restricted to lower densities and heights in this MCA.	Mid-term	■	■	■	■	■	■	

Issue / Strategy ID	MCA	Issue / Strategy	Timeframe	Meade County	Pennington County	City of Box Elder	City of Rapid City	SDEDA	Ellsworth AFB	Other
		■ APZ Subzone. The area covers the CZ, APZ I, and APZ II. These areas have varying levels of potential for aircraft incidents. ■ BASH MCA. This is a five-mile statutory area that is prone to bird air strikes, and as such lands in this area should include additional land use regulations, as appropriate, to reduce land uses that attract birds and wildlife. High-priority biological resource areas may be exempt from this. ■ Imaginary Surfaces MCA. An area that is defined by the Airfield Imaginary Surfaces. Restrictions to vertical heights and renewable energy development areas will apply in this MCA. This MCA is composed of six different subzones all with varying slopes and heights from which to restrict outside land uses to these heights.								
LU-3B	Study Area MCA	Maintenance and Update of MCAs Ellsworth AFB shall provide updated information to the JLUS Coordination Committee when changes in operations or circumstances result in the need to update or modify one of the MCA boundaries. The JLUS Coordination Committee will be responsible for making a recommendation to members to incorporate these changes into appropriate plans, regulations, and policies. Other Partner: JLUS Coordination Committee	On-going	☐	☐	☐	☐	☐	☒	☐
		See Strategy AT-3A								

Issue / Strategy ID	MCA	Issue / Strategy	Timeframe	Meade County	Pennington County	City of Box Elder	City of Rapid City	SDEDA	Ellsworth AFB	Other
LU-4	Increase in Development West of Ellsworth AFB may Require Protections from the Base's CZ and APZ Potential annexation and road improvements may spur growth in areas nearby CZ and APZs.									
LU-4A	Study Area MCA	Incorporate Ellsworth AFB as one of the agencies that review pre-development applications / proposals Jurisdictions should consider enhancing existing or establish an MOU between local jurisdictions and Ellsworth AFB to formalize a process that provides copies of certain types of development proposals, rezoning (excluding Meade County), and other land use or regulation changes for lands located within the MCAs to Ellsworth AFB for review and comment. Such review periods shall conform to existing community review periods for providing comment. This supports a proactive approach for identifying potential conflicts early in the development process. The process of formalizing Ellsworth AFB review and comment should include: ■ Definition of project types that require review ■ Definition of project types that require military attendance at pre-application meetings ■ Identification of the points of contact for all coordination ■ Establishing a formal procedure for requesting and receiving comments ■ Establishing a standard timeline for responses, keeping in mind mandated review time periods as specified by state law and local procedures ■ Providing notice to the military on all public hearings regarding projects identified for coordination ■ Procedures should be reviewed annually and updated as appropriate by the JLUS Coordination Committee (see Strategy COM-1A).	Short-term	■	■	■	■		□	
LU-4B	Study Area MCA	Update Plans and Amend Ordinances Meade and Pennington counties should regularly update their comprehensive plans and Pennington County should amend its zoning ordinances to incorporate land use policies, development guidelines and regulations for the potential development of the county islands. These new policies, guidelines, and regulations should include military compatibility guidelines.	Long-term	■	■					

Issue / Strategy ID	MCA	Issue / Strategy	Timeframe	Meade County	Pennington County	City of Box Elder	City of Rapid City	SDEDA	Ellsworth AFB	Other
		See Strategy LU-2A								
NOISE (NOI)										
NOI-1	Noise Exposure to Areas Surrounding Ellsworth AFB Flight operations, including typical flight operations, nighttime operations, engine testing and combat departures, generate noise exposures to surrounding areas.									
NOI-1A	Noise MCA	Develop and Provide Sound Attenuation Technical Support JLUS jurisdictions should develop and provide educational materials, either through inclusion in the adopted building codes or as a supplemental educational document, describing building techniques which can be used to achieve the required 45 dB interior noise maximum threshold. Jurisdictions could pursue funding from DOD to produce technical support materials, with other stakeholders distributing and using these materials.	Short-term	■	■	■				
NOI-1B	Noise MCA	Amend Building Codes Jurisdictions in the Noise MCA should consider amending building codes to regulate exterior to interior noise at no greater than a 45 dB.	Mid-term	■	■	■				
NOI-1C	Noise MCA	Update Comprehensive Plans to Establish Provisions for Discouraging Mobile / Manufactured Homes in Noise MCA The JLUS jurisdictions should update their comprehensive plans to establish standards for new mobile homes or manufactured homes. Such homes should be discouraged to locate in the Noise Subzone areas of the Ellsworth AFB MCA. Mobile / manufactured homes are not built with construction materials that can adequately mitigate for sound attenuation. In addition, mobile / manufactured home courts should not be grandfathered into jurisdictional land use plans.	Long-term	■	■	■				



Issue / Strategy ID	MCA	Issue / Strategy	Timeframe	Meade County	Pennington County	City of Box Elder	City of Rapid City	SDEDA	Ellsworth AFB	Other
NOI-1D	Noise MCA	Amend Zoning Ordinances to Establish Regulations for Discouraging Mobile / Manufactured Homes in Noise Subzone The JLUS jurisdictions should amend their zoning ordinances discouraging any new mobile homes or manufactured homes to locate in the Noise Subzone areas of the Ellsworth AFB MCA. Mobile / manufactured homes are not built with construction materials that can adequately mitigate for sound attenuation.	Long-term		■	■				
NOI-2	Incompatible Land Uses in 75-80+ Noise Zone Residential, commercial, and public / semi-public land uses are located within this noise zone in the City of Box Elder.									
NOI-2A	Noise MCA	Update Comprehensive Plans and Amend Zoning Ordinances and Municipal Codes for Noise Attenuation Standards The City of Box Elder should update its comprehensive plan and amend its zoning ordinance and municipal code to comply with the recommended guidelines from the most current AICUZ report of Ellsworth AFB.	Long-term			■			□	
NOI-2B	Noise MCA	Consider Developing a Voluntary Sound Attenuation Retrofit Program for Residential Uses Consider developing a program that provides guidance on sound attenuation standards for retrofitting existing residential and commercial facilities. The program can include grant opportunities available to assist property owners in retrofitting structures in noise-sensitive areas. Other funding sources for retrofitting homes should be identified and provided within the program materials as well.	Short-term	■	■	■				
NOI-2C	Noise MCA	Housing Relocation The JLUS Coordination Committee should look for ways to relocate the residents of the Box Elder Trailer park outside Ellsworth AFB in order to reduce noise impacts on residents. Other Partners: JLUS Coordination Committee, housing advocates	Short-term							■

Issue / Strategy ID	MCA	Issue / Strategy	Timeframe	Meade County	Pennington County	City of Box Elder	City of Rapid City	SDEDA	Ellsworth AFB	Other
ROADWAY CAPACITY (RC)										
RC-1	Demand for Transit Service To and From Ellsworth AFB According to findings in the Box Elder Transportation Plan, there is an unmet demand for transit to and from Ellsworth AFB.									
RC-1A	Study Area MCA	Develop Feasibility Study The Rapid City Area MPO should continue to work with Ellsworth AFB to develop a study that assesses the feasibility for various transit connections and locations. The study should also identify solutions to connecting external transit buses with internal installation buses. This study would include an analysis of cost versus benefit of the transit connections and locations. Other Partners: Rapid City Downtown Association, Rapid City Area MPO	Mid-term						☐	☒
RC-1B	Study Area MCA	Consider Transit Center Outside Ellsworth AFB Main Gate Consider redeveloping the area outside Ellsworth AFB's Main Gate to host a multi-modal transit center that facilitates access to the community and shopping areas from personnel on the base. Associated with this transit center would be the development of internal transit within Ellsworth AFB.	Long-term			☒			☐	
RC-1C	Study Area MCA	Compatibility Considerations in Transportation Planning The South Dakota Department of Transportation (SD DOT), in conjunction with the City of Box Elder, the Rapid City Area MPO, and the Federal Highway Administration, should include JLUS findings and recommendations as it conducts its comprehensive traffic study on I-90, from Exit 61 to Exit 67 Corridor, in particular, as it pertains to the 2008 AICUZ guidelines; especially roadway traffic flows that may impact current or future base operations, mission capabilities, and mission growth / expansion. Other Partners: SD DOT, Rapid City Area MPO, Federal Highway Administration	On-going			☒				☒

Issue / Strategy ID	MCA	Issue / Strategy	Timeframe	Meade County	Pennington County	City of Box Elder	City of Rapid City	SDEDA	Ellsworth AFB	Other
RC-2	Increased Traffic Congestion on Roads Due to Closure of Highway Access, Exit 66 The closure of highway access at Exit 66 has created traffic congestion on other roads.									
RC-2A	Study Area MCA	Develop Divert Routes Plan The City of Box Elder should continue to work closely with South Dakota Department of Transportation (SD DOT) to assess local road conditions and develop plans for infrastructure enhancements that will assist in meeting peak hour demands. Box Elder should refer to the Exit 61 to 67 Corridor Study from SD DOT. The JLUS Coordinating Committee should support the City of Box Elder in making this a priority for SD DOT. Other Partners: South Dakota Department of Transportation (SD DOT), JLUS Coordination Committee	On-going			■				□
RC-2B	Study Area MCA	Notification of Divert Routes Plan Ellsworth AFB should work with the City of Box Elder and SD DOT to inform personnel of alternative routes that would help reduce congestion. These organizations should also work together to inform Ellsworth AFB personnel of any changes to the local circulation system. For short-term closures or diversions, notify personnel about the divert routes available to alleviate congestion. As part of this notification, delineation of effective dates and times of this divert route should be announced and made available on websites and through social media outlets. Other Partner: SD DOT	On-going			□			■	■
SAFETY ZONES (SA)										
SA-1	Existing and Future Bird Attractants Surrounding Ellsworth AFB Pose Strike Threats Ponds that are located both on-base and off-base attract waterfowl.									
SA-1A	BASH MCA	Control bird and wildlife attractants near base Work directly with local jurisdictions and other appropriate agencies on control of bird and wildlife attractants in the vicinity of the base and within flight paths.	On-going	□	□	□	□		■	

Issue / Strategy ID	MCA	Issue / Strategy	Timeframe	Meade County	Pennington County	City of Box Elder	City of Rapid City	SDEDA	Ellsworth AFB	Other
SA-1B	BASH MCA	BASH consideration in jurisdiction or agency projects All projects sponsored by a local jurisdiction or agency should consider bird attractants and require consultation with Ellsworth AFB representatives on the review and mitigation of significant direct and indirect bird attractant features that may be generated through the approval of development proposals.	On-going	■	■	■	■	■	□	
SA-1C	BASH MCA	Increase surrounding landowner awareness Develop a detailed outreach and educational program to inform surrounding landowners on the impacts, size and effect, of BASH and outline compatible solutions and techniques to minimize conflicts.	Short-term						■	
SA-2	Ellsworth AFB Does Not Own All of the Land within the Primary Surface Land that is part of the Primary Surface is located outside of the fence line and is not owned by Ellsworth AFB.									
SA-2A	Safety MCA	Consider Acquisition of Remaining Primary Surface Land Ellsworth AFB, the JLUS jurisdictions, SDEDA and land conservancies should consider collaborating to acquire or place into easement the land that is designated as Primary Surface Land of the airfield to ensure protection and management of the area is compatible with airfield operations. Other Partners: land conservancies	Mid-term	■	■	■		■	■	■
SA-3	Existing Land Uses in Runway Safety Zones There are some incompatible uses that currently exist within safety zones.									
		See Strategies for Issue LU-4								



Issue / Strategy ID	MCA	Issue / Strategy	Timeframe	Meade County	Pennington County	City of Box Elder	City of Rapid City	SDEDA	Ellsworth AFB	Other
VERTICAL OBSTRUCTIONS (VO)										
VO-1	Power Poles in Accident Potential Zone Incompatible wooden poles that are not easily broken need to be moved underground.									
VO-1A	Vertical Obstruction MCA	Develop Feasibility Study for Underground Conversion or Relocation The City of Box Elder and Pennington County should work with the utility provider to develop a feasibility study to determine the potential to relocate or underground the facilities in the base APZs. Public-public, public-private partnerships may be able to be utilized to fund this endeavor, if determined necessary. Other Partner: Utility providers	Mid-term	■	■	■	■		□	
VO-1B	Vertical Obstruction MCA	Ensure Imaginary Surface / FAA Part 77 compliance For all new, redeveloped or rehabilitated structures (including electrical transmission towers/lines, cellular and radio transmission towers, etc.), ensure compliance with Ellsworth AFB Imaginary Surfaces / FAA Part 77 height limit requirements to minimize vertical obstructions (e.g., buildings, telecommunications facilities, recreational facilities, energy transmission/generation towers, etc.). In addition, ensure the developments and structures are compatible with, and do not pose a safety hazard to, air operations in the region.	On-going	■	■	■	■		□	
VIBRATION (V)										
V-1	Vibration from Aircraft Operations Vibrations occur during Ellsworth AFB aircraft takeoffs.									
V1-1A	Study Area MCA	Educate the Public on Cause of Vibrations Ellsworth AFB should work to inform the public on why vibrations occur during aircraft maneuvers.	Short-term						■	

Issue / Strategy ID	MCA	Issue / Strategy	Timeframe	Meade County	Pennington County	City of Box Elder	City of Rapid City	SDEDA	Ellsworth AFB	Other
WATER QUALITY / QUANTITY (WQQ)										
WQQ-1	Deicing Fluid Although most is captured in basins, there is potential that residual deicing fluid could affect water quality.									
WQQ-1A	Study Area MCA	Conduct Deicing Fluid Runoff Study Ellsworth AFB should continue to monitor water quality for runoff leaving the installation to ensure water quality requirements are being met. If issue with runoff is determined, the base should work with state regulators to develop additional controls to capture and treat contaminated runoff.	Mid-term						■	
WQQ-2	Fuel Spill Potential Containment features are typically very effective, yet when high winds and heavy rains are present; it is possible for fuel spills to move off-base.									
WQQ-2A	Study Area MCA	Update Storm Water Pollution Prevention Plan Ellsworth AFB should update its storm water pollution and prevention plan to account for weather events that can disperse fuel spills and other pollutants off-base. The update should include mitigation measures in times of high winds and heavy rains, which could mean the need for additional barriers during these weather events. In addition Ellsworth AFB should coordinate storm water plans with all jurisdictions.	Long-term	□	□	□	□		■	
WQQ-3	Past Fuel Operations Groundwater Contamination Fuel contamination on Ellsworth AFB from past operations has contributed to some groundwater contamination in the local area.									
WQQ-3A	Study Area MCA	Continue Remediation and Monitoring of Contaminated Site Ellsworth AFB should continue to monitor the contaminated site and affected off-base locations until cleared and complete remediation is achieved. As appropriate, Ellsworth AFB should notify media outlets of status of remediation and monitoring to ensure correct information is circulating about the contaminated site.	On-going						■	



Issue / Strategy ID	MCA	Issue / Strategy	Timeframe	Meade County	Pennington County	City of Box Elder	City of Rapid City	SDEDA	Ellsworth AFB	Other
WQQ-4		Potential for Fertilizer and Pesticide Runoff Fertilizers and pesticides from the base and golf course can potentially runoff into water courses.								
WQQ-4A	Study Area MCA	Update Ellsworth AFB Stormwater Pollution Prevention Plan Ellsworth AFB should update its stormwater pollution prevention plan to incorporate measures of removing noxious weeds through other means, perhaps small prescribed fires or other non-invasive treatments for noxious weed control.	Mid-term						■	
WQQ-4B	Study Area MCA	Use Natural Methods for Noxious Weed Control Ellsworth should look into natural ways of mitigating noxious weeds, such as the use of goats.	Mid-term							

Please see the next page.



