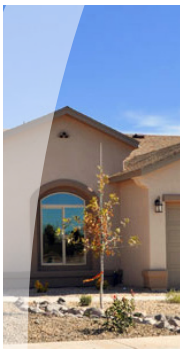

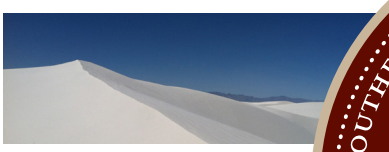

SOUTHERN NEW MEXICO • EL PASO, TEXAS

JOINT LAND USE STUDY

★ ★ ★

WHITE SANDS MISSILE RANGE | FORT BLISS | HOLLOMAN AFB

EXISTING CONDITIONS
INITIAL COMPATIBILITY ASSESSMENT REPORT | 2015

AECOM

This study was prepared under contract with Doña Ana County, New Mexico, with financial support from the Office of Economic Adjustment, Department of Defense. The content reflects the views of study partners and does not necessarily reflect the views of the Office of Economic Adjustment.

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LIST of ACRONYMS

1AD – 1st Armored Division
AAF – Army Airfield
AAMDC – Army Air & Missile Defense Command
ABQ – Albuquerque International Sunport
ACUB – Army Compatible Use Buffer
ACEC – Area of Critical Environmental Concern
AETC – Air Education Training Command
AFRL – Air Force Resource Laboratory
ARFORGEN – Army Force Generation
AGL – Above Ground Level
AICUZ – Air Installation Compatible Use Zone
APOE – Aerial Port of Embarkation
APZ –Accident Potential Zone
AR – Aerial Refueling
ARC – Acoustic Research Complex
ARL – Army Research Laboratory
ARMS – Alliance for Regional Military Support
ARTCC - Air Route Traffic Control Center
ATC – Air Traffic Control
ATEC – Army Test and Evaluation Center
BASH – Bird Aircraft Strike Hazards
BEAR – Basic Expeditionary Airfield Resources
BLM – Bureau of Land Management
BMC – Brigade Modernization Command
BRAC – Base Realignment and Closure
CAB – Combat Aviation Brigade
CACTF – Combined Arms Collective Training Facility
CCM – Center for Countermeasures
CCS – Counter Communication System
CDN – C-weighted Noise
CDNL – Day-Night Average Sound Level for C-weighted noise
CIGTF – Central Inertial and GPS Test Facility
CLI – Cultural Landscapes Inventory
CoA – Certificate of Authorization
CRC – CONUS Replacement Center
CRRUA – Camino Real Regional Utility Authority
CSP – Concentrated Solar Power
DAGIR – Digital Air-to-Ground Integration Range
dB - Decibels
DMPTC – Digital Multi-Purpose Training Complex
DNL – Day-Night Average Sound Level
DoD – Department of Defense
DOI – Department of the Interior
DTRA – Defense Threat Reduction Agency
EBID – Elephant Butte Irrigation District
EIS – Environmental Impact Statement
EMRE – Electromagnetic Radiation Effects
EMR – Energy Electromagnetic Radiation
EPIA – El Paso International Airport
ETZ – Extra-Territorial Zoning
FAA – Federal Aviation Administration
FBTC – Fort Bliss Training Complex
FCC – Federal Communications Commission
FLPMA – Federal Land Policy and Management Act
FORSCOM – Forces Command
FTU – 2 – Second Formal Training Unit
FTX – Discrete field training site
GAF – German Air Force
GAF TTC – German Air Force Tactical Training Center
GEODSS – Ground-based Electro-Optical Deep Space Surveillance
GLO – Texas General Land Office
HAFB – Holloman Air Force Base
HAMET – High Altitude Mountain Environment Training
HBCT – Heavy Brigade
HE – High Explosive
HELSTF – High Energy Laser Systems Test Facility
HPM – High Powered Microwave
HSTT – High Speed Test Track
IBCT – Infantry Brigade
ICRMP - Integrated Cultural Resources Management Plan
ICEMAP – Installation Complex Encroachment Management Action Plan
IFDS – Integrated Frequency Deconfliction System
INRMP – Integrated Natural Resources Management Plan
IONMP – Installation Operational Noise Management Plan
JEF – Jornada Experimental Range
JLENS – Joint Land Attack Cruise Missile Defense Elevated Netted Sensor System
JLUS – Joint Land Use Study
JPA – Joint Planning Agreement
JTX – Joint Training Exercise
LUASP – Land Use and Airspace Strategy Plan
LUPZ – Land Use Planning Zone
MOA – Memorandum of Agreement
MPO – Metropolitan Planning Organization
MRTFB – Major Range and Test Facility Base
MRU – Military Radar Unit
MTRs – Military Training Routes
NAS – National Airspace System
NASA – National Aeronautics and Space Administration
NEPA – National Environmental Policy Act
NGA – National Geospatial Intelligence Agency
NHPA – National Historic Preservation Act
NIA – Network Integration Exercise
NIE – Network Integration Evaluation
NMSA – New Mexico Spaceport Authority
NMSLO – New Mexico State Land Office
NOTAMs - Notices to Airmen
NPS – National Park Service

LIST *of* ACRONYMS

NRAO – National Radio Astronomy Observatory
NRO – National Reconnaissance Office
NRTF – National Radar Cross Section Test Facility
NTIA – National Telecommunications and Information Administration
NVD – Night Vision Training Devices
OEA – Office of Economic Adjustment
OE/AAA – Obstruction Evaluation/Airport Airspace Analysis
PA – Programmatic Agreement
PC – Policy Committee
PV – Photovoltaic
RAMS – RATSCAT Advanced Measurements
RANM – Realtors Association of New Mexico
RATSCAT – Radar Target Scatter
REPI – Readiness and Environmental Protection Initiative
RMP – Resource Management Plan
RMPA – Resource Management Plan Amendment
RPA – Remotely Piloted Aircraft
RPO – Regional Planning Organization
R&PP – Recreation and Public Purposes Act
SBCT – Stryker Brigade
SLVs – Suborbital Launch Vehicles
SNM-EP – Southern New Mexico/El Paso Texas
SOSI – System of System Integration
SPOE – Sea Port of Embarkation
STA – South Training Areas
SVAD – Survivability, Vulnerability, and Assessment Directorate
TAR – Texas Association of Realtors
TC – Technical Committee
TDRSS – Tracking and Data Relay Satellite System
TDS – Total Dissolved Solids
TG – Test Group
TRADOC – Training and Doctrine Command
TREC – Texas Real Estate Commission
TRIAD - Partnership between HAFB, WSMR, and Fort Bliss
UAS – Unmanned Aircraft System
UAS FTC – Unmanned Aircraft System Flight Test Center
UAV – Unmanned Air Vehicle
USAADASCH – United States Army Air Defense Artillery School and Center
USDA – U.S. Department of Agriculture
USFS – United States Forest Service
USFWS – United States Fish and Wildlife Service
VHF – Very High Frequency
WRP – Western Regional Partnership
WSA – Wilderness Study Area
WSEP – Weapons System Evaluation Program
WHSA – White Sands National Monument
WSMR – White Sands Missile Range
WSPG – White Sands Proving Ground
WSSH – White Sands Space Harbor
WSTC – White Sands Test Center
WSTF – White Sands Test Facility

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01 STUDY BACKGROUND AND PURPOSE

1.1 Purpose of Document

The purpose of the Existing Conditions/Initial Compatibility Assessment Report is to provide the foundation for the following:

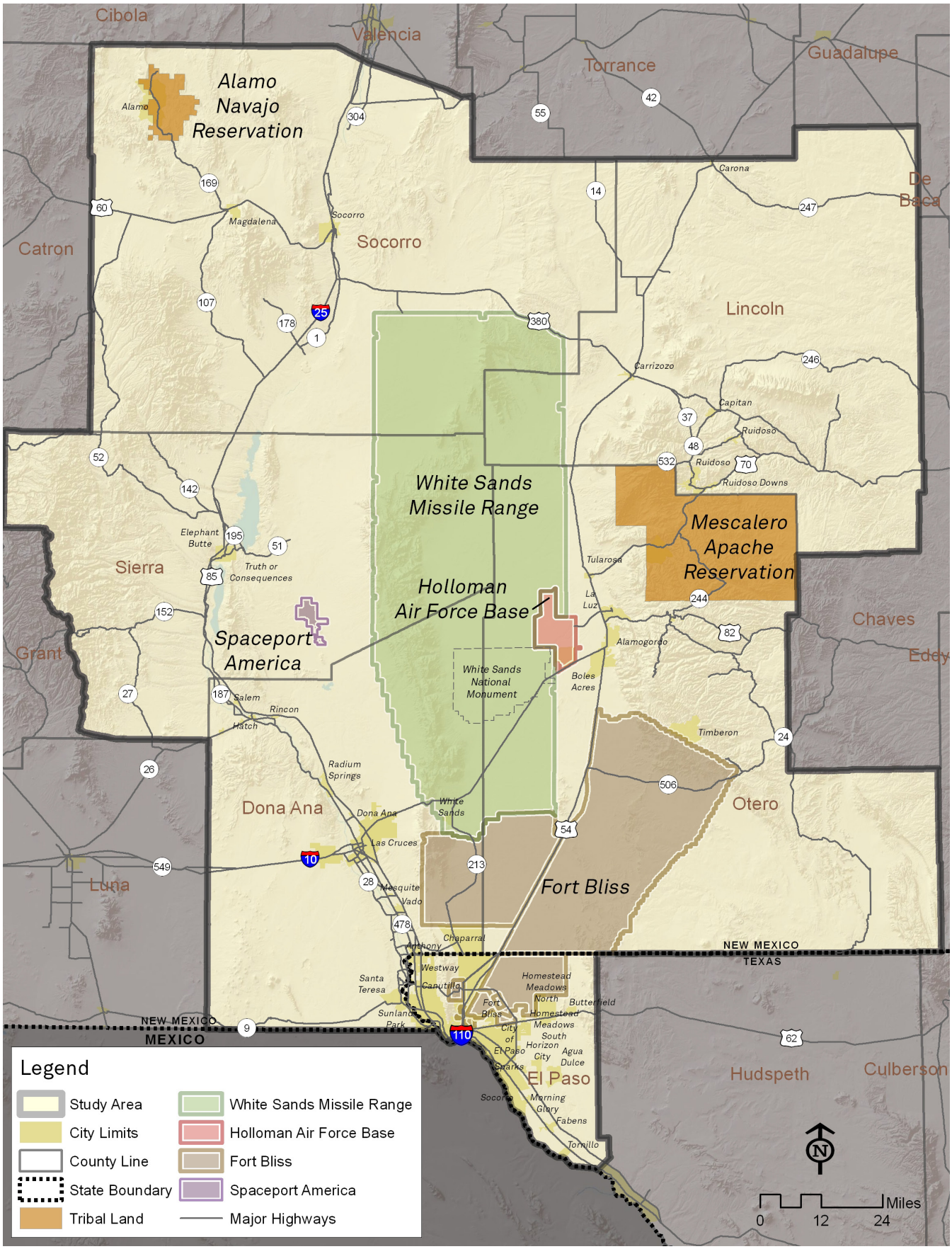
- An understanding of existing issues and emerging trends in the study area, including community growth and land use patterns; the background, mandates, and responsibilities of agencies that influence the use of resources within the region; current and foreseeable military missions; and current communication and coordination mechanisms;
- Elements such as the planning process, study purpose, goals, schedule, public input and partner descriptions that will be used in the final JLUS document;
- Initial set of compatibility factors and geographic areas of concern; and
- Identify any gaps in available regulatory or coordination tools that could then form the basis for later recommendations.

1.2 Study Area

The Southern New Mexico-El Paso Texas Joint Land Use Study (JLUS) area encompasses six counties, two states, and the three military installations of Fort Bliss, White Sands Missile Range (WSMR), and Holloman Air Force Base (HAFB). As illustrated in **Figure 1.1**, Doña Ana, Sierra, Lincoln, Otero, and Socorro Counties in New Mexico and El Paso County, Texas surround the installations. The land area of interest is approximately 7,600 square miles–one of the largest JLUS areas ever studied. Within its geographic span, the region's natural, cultural and recreational resources, weather, terrain, growth opportunities, and diversity of military training and testing missions converge to create one of the most unique defense communities in the United States.

More than one million residents currently live in the Southern New Mexico-El Paso Texas (SNM-EP) region, with communities ranging in size from the sixth largest city in Texas and New Mexico's second largest city to small resort towns and sparsely populated ranch lands. On the military side, the controlled airspace and land assets of the three installations support one of the premier testing and training environments in the U.S. with capabilities that include the research, development, and testing of military systems, fighter pilot and Remotely Piloted Aircraft (RPA) training, and wheeled and mechanized maneuver training. The complexity and fluidity of landownership patterns, diversity of economic and resource interests and the presence of multiple operational and mission needs reinforce the value of a coordinated planning process that highlights the common interests of the region.

FIGURE 1.1 | SOUTHERN NEW MEXICO – EL PASO JLUS STUDY AREA



1.3 Study Background

Military installations and their surrounding communities share a close relationship. Missions bring new people to an area, increase economic activity, and create new jobs to support military personnel, civilian workers, and their families. This growth in turn increases the demand for housing, schools, and infrastructure. However, if corresponding development is not coordinated with military operations, two undesirable outcomes can emerge—first, residents begin to live and work in proximity to noise, safety risks or other impacts associated with military activities; and second, increased community exposure to impacts can place pressure on installations to modify the scope of operations, possibly compromising overall mission viability.

Several physical characteristics of the SNM-EP region are critical to the effective performance of missions at Fort Bliss, WSMR, and HAFB, including expansive, contiguous areas of controlled airspace to support aviation activity; rugged, uninterrupted land areas to accommodate maneuver training and hazardous test events; a clear electronic spectrum; and a wide range of geologic features, including the Tularosa Basin. The basin covers about 6,500 square miles between the Sacramento Mountains to the east and the San Andres, Organ, and Franklin Mountains to the west. It stretches approximately 150 miles north-south and 60 miles east-west. The ability to deploy and support operational forces, perform realistic aviation and live-fire training, and conduct weapons system testing in this environment is vital to maintaining the mission effectiveness of the three installations and the overall readiness of military forces.

Although Fort Bliss, WSMR, and HAFB are located in the SNM-EP region because of its relatively undeveloped surroundings, adjacent cities and communities within the study area have experienced steady population increases in recent years, particularly in and around the urban centers of El Paso, Texas and Las Cruces, New Mexico. Population increases and related development can alter the physical setting of the region and thus could jeopardize the availability of airspace and land for military, as well as other state and federal agency purposes. Conversely, military-related impacts can affect safety and quality of life in surrounding communities. The JLUS uses the concept of compatibility to describe and analyze this overlapping set of issues.

As part of the planning process to initiate the JLUS (see **Section 2** for a more detailed description of the study initiation effort), regional partners identified a preliminary list of potential compatibility factors, including:

- Urban growth and development in the areas around the communities of Las Cruces, Alamogordo, Orogrande, Chaparral, and El Paso, with limited community planning and development controls outside of municipal boundaries;
- Availability of and access to water;
- Frequency and electromagnetic spectrum issues;
- Blasting and other activities associated with mining;
- Internal and external competition for and access to airspace, including a commercial spaceport located within the WSMR Western call-up area and regional airports;
- Concerns over military use of federal non-Department of Defense (DoD) lands for training activities;
- Operational constraints related to natural resources requirements, including threatened and endangered species, air quality, and regulatory changes;
- Potential sale or disposal of adjacent State Trust Lands and Bureau of Land Management (BLM) lands resulting in incompatible uses; and
- Generational shifts among ranching families that own and/or lease land in the region, possibly creating pressure for incompatible development.

The purpose of the JLUS compatibility assessment is to confirm, refine, and build on these initial factors through stakeholder feedback, the review of existing studies, and technical analysis.

1.4 Study Purpose and Goals

The JLUS is a collaborative process among city and county governments; the public; state and federal agencies; tribal governments; and military installations within the SNM-EP region. The study is designed to create dialogue around complex issues such as land use, economic development, infrastructure, environmental sustainability, and the operational demands and mission change of both military and civilian entities. The intent of the study is to highlight common interests, such as stable economic growth, more efficient infrastructure, healthier environments, improved quality of life, and the protection of DoD and civilian investments and missions.

The JLUS Final Report will provide a series of recommendations to guide future decisions and policy actions by public agencies, military installations and other partners. Recommendations are not binding, but study participants are asked to make a good faith effort to implement proposed action steps. The JLUS emphasizes coordination and communication as a way to strengthen the relationship among the study area partners and to build a framework for successful implementation and monitoring of recommendations around shared goals.

The overall goals of the JLUS are to:

- Provide opportunities for input by stakeholders, including landowners, federal, state, county and municipal government agencies, educational institutions, tribal governments, and other interested parties in all stages of the planning process;
- Protect the public health and safety of both the civilian and military communities;
- Jointly analyze the factors that can restrict range and training missions as a result of incompatible land use development adjacent to Fort Bliss, WSMR, and HAFB;
- Cooperatively develop a set of recommendations for use by local governments, community associations, developers and the military to preserve, protect and enhance these missions so as not to adversely affect the missions of Southern New Mexico and El Paso's military installations;
- Identify uses that are compatible and feasible for land in the vicinity of military installations, airports, and ranges, including the noise and accident potential zones;
- Develop a strong implementation plan to address compatibility challenges by development and its resulting impact on military missions and sustainability by establishing solid compatibility criteria and strong policies that can be implemented by federal, state, and local governments;
- Develop and/or identify land use planning and policy tools, strategies, and techniques that fairly allocate impacts of the program with respect to federal, state, and local governments, private landowners, and the military community;
- Support local communities in sustaining safe, compatible growth;
- Improve regional cooperation as it relates to military community compatibility and encourage cooperative land use planning between military installations and the surrounding communities; and
- Have an enduring forum for cooperation, communication, and implementation.

Socorro County JLUS Public Meeting

02 SUMMARY OF STUDY PARTNER PARTICIPATION

2.1 Study Initiation

The JLUS is funded by a grant from the DoD's Office of Economic Adjustment (OEA) and local match contributions from participating jurisdictions. To initiate the application process, military installations request a JLUS through their respective chain of command and are then formally nominated by their respective Secretariats. As part of the SNM-EP JLUS process, the study partners entered into a Memorandum of Agreement (MOA) establishing a Regional Planning Organization (RPO) to direct the effort (see **Technical Appendix** for the full MOA). The MOA establishes the organizational structure of the RPO, identifies a fiscal agent to administer the JLUS, and sets a budget of local contributions to fund the effort. Consistent with the grant agreement, the formal study partners will assume 13 percent of total project costs, which can include in-kind contributions.

2.2 Formal Study Partners

To reflect the complexity of the study area, a diverse range of partners from throughout the region has formally joined in the study process, including:

- Doña Ana County
- Otero County
- Lincoln County
- Socorro County
- Sierra County
- El Paso County
- The City of Alamogordo
- The City of Las Cruces
- The City of El Paso
- Fort Bliss
- White Sands Missile Range
- Holloman Air Force Base
- New Mexico State Land Office
- Bureau of Land Management
- New Mexico Office of Military Base Planning and Support
- Military Base Planning Commission
- New Mexico Spaceport Authority

These entities provide representation to the committees described in **Section 2.3**.

2.3 JLUS Committees

As part of the MOA, the study partners formed a Policy Committee and Technical Committee to guide the planning effort, assist in developing technical content, and build support for the implementation of recommendations.

Policy Committee
The Policy Committee (PC) consists of local elected officials from cities and counties participating in the MOA, as well as senior Air Force and Army leadership and representatives from federal and state entities. This committee oversees the JLUS process, reviews draft and final written reports, and evaluates policy recommendations. Policy Committee sessions are open to the public.

Technical Committee
This working group consists of area planners, city and county officials, technical and professional staff, and military planners. Members are responsible for assisting in data collection, identifying and studying technical issues, and developing recommendations for evaluation by the PC. Technical Committee (TC) meetings coincide with key milestones in the study process, including existing conditions findings, compatibility assessment results, draft strategy assessment, and implementation plan development (see **Table 2.1**).

Project Management Team
The Project Management Team (PMT) is a subset of the TC that directly supervises JLUS planning activities and provides support and guidance for ongoing meeting and public outreach events, data collection and review, and the delivery of study products.

2.4 Stakeholder Interview Input

In addition to committee meetings and document review, the planning team has conducted face-to-face or telephone interviews with key stakeholders in the public, private, and community sectors to establish priorities for the study, gather data, and identify challenges to be examined more fully (see the **Technical Appendix** for the full list of stakeholders interviewed). Stakeholders have cited a wide variety of themes and issues, including:

- The recognition that there is a positive existing relationship between the military installations and surrounding communities and other federal or state agencies;
- Specific examples of effective communication with individuals at installations or agencies and existing memoranda of understanding/mutual aid agreements;

Committee	Study Milestone	Date
Policy and Technical Committee 1	Kick-Off	December 17, 2012
Technical Committee 2	Review of Preliminary Compatibility Challenges, Stakeholder Themes, and Public Involvement Plan	March 20, 2013
Policy Committee 2	Review of Key Compatibility Findings and Input on Public Involvement Plan	May 1, 2013
Technical Committee 3	Review of Existing Conditions and Initial Compatibility Assessment Report	August 5, 2013
Technical Committee 4	Draft Strategy Workshop	October 23, 2013
Policy Committee 3	Review of Existing Conditions Findings	December 2013
Technical Committee 5	Implementation Workshop	TBD
Technical Committee 6	Initial Draft Plan Review	TBD
Policy Committee 4	Final Draft Plan Review	TBD

Table 2.1 | Policy and Technical Committee Meetings

- A desire for increased interaction, outreach, and coordination of missions, and land use and development actions;
- A desire to enhance quality of life for military personnel and to coordinate the delivery of services across jurisdictions;
- Understanding that there is a complex mix of land tenure with federal, state, and private interests and the potential for evolving land use status throughout the region;
- Specific operational impacts experienced in surrounding communities, particularly noise and sonic booms associated with aviation activity and periodic noise and vibration caused by range firing; other factors include wildfires, water resource management, periodic road closures, and GPS jamming;
- Awareness that anticipated growth in some communities, particularly east of the City of Las Cruces and in Chaparral could be subject to exposure from operational impacts;
- Concern that existing or proposed uses or activities such as renewable energy infrastructure or towers can trigger compatibility concerns with military testing, training, and aircraft operations;
- Identified challenges related to airspace, training, and testing scheduling, and radio frequency spectrum interference;
- Expressed concern regarding access and notification related to managing safety and the interface between authorized military and public uses in co-use areas;
- The presence of multiple, overlapping agency interests that will require ongoing coordination and long-term planning, including:
    - The need for flexibility to accommodate changing military operations and unforeseen mission needs; and
    - Other non-military related mission or operational needs such as resource management, the development of leases for state revenue generation and emerging alternative energy opportunities.
- The potential for experiencing or causing operational impacts, far from the installation boundaries where awareness about military operations may be less.

2.5 Community Participation

The JLUS is designed to be an inclusive, community-driven process that seeks to engage residents, local businesses, landowners, local and state governments, tribal governments, and others beyond the list of formal participants in the MOA. Obtaining input from a broad cross-section of stakeholders requires a multi-pronged outreach program that allows people to participate in a variety of ways.

The Public Relations and Public Participation Plan is the overarching framework that establishes goals for the engagement process and outlines public input activities. Major outreach mechanisms include large format meetings, targeted listening sessions that are focused on specific geographic areas or stakeholder interests, and the development of a project website: www.SNMEPJointLandUse.com.

Public Meeting participants

Round #1 Public and Community Meetings

The planning team held six public meetings for the JLUS from June 3 through June 13, 2013 (see **Table 2.2**). The meetings were part of the initial phase of community outreach conducted for the study and assisted in describing existing conditions in the region (see **Technical Appendix** for full summary of meeting input). A total of 130 people attended the June sessions, including members of the Policy and Technical Committees and representatives of study partner entities.

The general purpose of the meetings was to introduce the JLUS process; give an overview of study partners, including the local governments and Fort Bliss, HAFB, and WSMR; present preliminary compatibility themes; and invite feedback to confirm and refine the initial list of potential study issues. The planning team also conducted three community events in September 2013 at Weed and Chaparral, New Mexico and at Ranchers Day on WSMR. Community events are designed to be more targeted outreach activities that focus on specific geographic areas or stakeholder groups with distinct interests. Approximately 100 people participated in the September events. Attendees at the Weed and Chaparral meetings offered input to prioritize compatibility issues as described below, while residents attending Ranchers Day were asked to complete the JLUS survey.

Participants were asked to prioritize the following list of 17 initial compatibility themes, highlighting those items that they thought were most critical to address in the study:

- Aviation Noise
- Range Noise
- Energy/Renewable Energy
- Towers
- Road Closures
- Trespass/Access
- Airspace
- Multiple Use Areas
- Call-up Areas
- Cultural/Natural/Recreation Resources
- GPS Jamming and Frequency Spectrum Interference
- Quality of Life/Accommodating Military-Related Growth
- Coordination/Communication
- Water
- Light Pollution
- Mining
- Wildfires (related to military exercises)

The 17 initial themes were displayed on a board. Participants were then given four "dot" stickers and asked to place them next to a factor that they had either experienced and/or thought was important for the JLUS to address. Respondents were instructed to spread the dots in accordance with the intensity of their priorities so that all four stickers could be placed next to one factor to emphasize their most critical issue or allocated among four separate items.

Overall, water received the highest number of priority stickers followed by energy/renewable energy development, aviation noise, and quality of life/accommodating military-related growth. Input also varied geographically, with respondents in Otero County/City of Alamogordo emphasizing the accommodation of military-related growth; and energy/renewable energy emerging as the most prominent factor in Socorro County. Participants in Weed expressed concern about sonic booms from aircraft activity, while Chaparral residents cited issues related to the use of local roadways by wheeled military vehicles.

Meeting	Participants
Lincoln County | Monday, June 3, 2013 | Ruidoso Convention Center, Ruidoso, NM	14
El Paso County | Wednesday, June 5, 2013 | El Paso Community College-Transmountain Campus	11
Doña Ana County | Thursday, June 6, 2013 | Butterfield Community Center	21
Socorro County | Tuesday, June 11, 2013 | San Antonio Elementary School, San Antonio, NM	33
Otero County | Wednesday, June 12, 2013 | Sgt. Willie Estrada Memorial Civic Center, Alamogordo, NM	33
Sierra County | Thursday, June 13, 2013 | Sierra County Events Center, Truth or Consequences, NM	18
Weed, NM | Monday, September 23, 2013 | Weed Community Center	60
Chaparral, NM | Tuesday, September 24, 2013 | Betty McKnight Community Center	15
Ranchers Day | Friday, September 27, 2013 | WSMR	25

Table 2.2 I Round #1 Public Meetings

Participants also proposed additional compatibility themes including:

- Physical security for public near military installations
- Access to on-installation amenities for general public
- Contamination of groundwater by military activities/ environmental contamination
- Possible impact on public health from military activities
- Harm to local wildlife
- Military participation in community events
- Disconnect between cultural values of military and community
- Security of weaponry testing and protection against espionage
- Air quality/dust from ground operations/artillery
- Reduction in Trinity site opening events and local economic effects
- Reduction in Payment in Lieu of Taxes and local economic effects
- Dirt road use and dust and maintenance
- Wilderness study areas
- Economic issues related to local contractors/suppliers
- Concern over military vehicle convoys on local roads

To identify common elements among the feedback received, the planning team analyzed and grouped related individual comments under the series of broader themes:

- Recognition of the strong economic linkages between the military installations and the surrounding communities;
- Recognition of the complexity of the SunZia transmission corridor planning process and the potential impacts for the study area;
- Concern for private property rights;
- Concern for the environmental and physical resources of the study area, particularly related to water resources, and a desire for a regional, integrated carrying capacity analysis; and
- Opportunities for increased coordination around specific facilities, particularly airports and roadways.

The planning team and committees have drawn from comments received to refine the Existing Conditions and Compatibility Analysis.

2.6 JLUS Schedule

The JLUS is expected to take a total of 19 months, with completion anticipated in mid 2014. Key milestones and outreach events are identified in **Table 2.3**.

Joint Policy Committee and Technical Committee Kick-off Meeting	December 2012
Technical Committee 2	March 20, 2013
Conclude Phase 1 stakeholder interviews	mid-April 2013
Launch web site	mid to late April 2013
Policy Committee 2	May 1, 2013
Public meetings – Round 1	June 2013
Small community meetings (10)	July 2013 through April 2014
Existing Conditions/Compatibility Assessment Report	July 2013
Technical Committee 3	August 5, 2013
Draft Strategy Workshop/Technical Committee 4	October 23, 2013
Military Economic Impact Assessment Report	November 2013
Policy Committee 3	December 2013
Prioritized Recommendations Draft Report	TBD
Implementation Workshop/Technical Committee 5	TBD
Initial Draft Plan/Technical Committee 6	TBD
Public meetings – Round 2	TBD
Final Draft Plan/Policy Committee 4	TBD

Table 2.3 | JLUS Schedule and Milestones

03 OVERVIEW OF COMMUNITY PLANS AND REGULATORY POLICY

Land use tools, particularly zoning, subdivision regulations, and growth management policies are among the most effective compatibility measures available to local governments. Such tools may take the form of general policy language that emphasizes collaboration and compatibility between a community and military installation or specific regulatory codes that govern the density or type of development permitted in designated areas exposed to the impacts of military operations.

The following analysis reviews major existing policy documents and zoning and subdivision regulations for JLUS study area jurisdictions to identify compatibility elements, including:

- Policy language to promote collaboration and/or compatible development between the local community and nearby installations;
- Specific zoning overlays to require compatible development (i.e. infrastructure of a density, scale, or type) with nearby military operations;
- Specific performance-based codes that regulate the structural or site characteristics of development such as outdoor lighting or indoor sound attenuation;
- Flexible subdivision or planned development design that can assist in creating open space and thus natural mitigation buffers on specific project sites; and
- Broader land use strategies that can direct infill development to established neighborhoods and thus reduce new growth in previously undeveloped areas of the community that often experience higher exposure to military operational impacts due to installation proximity.

The **Appendix** contains the full summary table of documents reviewed, including the year prepared, geographic area covered, military/community compatibility references, general land use and growth vision, protected/conservation areas near installations, and military-related economic and population impacts.

In general, the results indicate a lack of specific compatibility provisions, particularly in older comprehensive plans and land use ordinances. However, as noted below several communities within the region are in the process of updating community plans. The JLUS offers an opportunity to develop guidance in conjunction with these ongoing and planned compatibility efforts. The findings can also assist in highlighting current gaps in the local land use regulatory environment and identifying potential tools for further evaluation during the recommendation phase of the JLUS.

The summaries contained in the section below capture the development, investment, and quality of life priorities of the local communities and reinforce the critical link among the region's cities, counties and military installations.

3.1 Otero County, NM

City of Alamogordo Background

Alamogordo, New Mexico is historically, and in the future, the place to "Discover, Launch, and Explore". Alamogordo sits within the Tularosa Basin that embraces the desert landscape along with the view of the Sacramento Mountains, and the white sands in White Sands National Monument.

Here you will find a small city of approximately 35,000 with the amenities of a much larger city. Those amenities include, but are not limited to: Desert Lakes Golf Course, Alamogordo-White Sands Regional Airport, Alameda Park Zoo, Alamogordo Senior Center, Alamogordo Public Library, Alamogordo Family Recreation Center, Sgt. Willie Estrada Memorial Civic Event Center, more than 20 parks and recreational activity units, Gerald Champion Regional Medical Center, Z-Trans Public Transportation, 7 RV Parks, Alamogordo Public Schools, NM School for the Blind and Visually Impaired, New Mexico State University – Adult Basic Education, and a terrific Department of Public Safety. Alamogordo is also known for the having the second lowest violent crime rate in the state of New Mexico. Projected future population by 2035 is 49,355 based on a 1.2% average annual growth rate

Alamogordo is also proud to be home to Holloman Air Force Base and NM Guard Infantry Unit. We love and embrace the men and women in uniform and their families. Holloman AFB supports about 21,000 Active Duty, Guard, Reserve, retirees, DoD civilians and their family members.

Area attractions and recreation opportunities are vast. It would take several days to see and do it all. The Alameda Park Zoo is the oldest zoo in the State and Southwest, and home to 40 spacious exhibits. Founders Park memorializes many pioneers that settled the Tularosa Basin in 1862. The Garden Center of Alamogordo may be reserved for special functions. Kids Kingdom is a large wooden park constructed by combined community effort, and a place for all age groups to enjoy. New Mexico Museum of Space History offers interactive exhibits from over 25 countries that enhanced space exploration and rocket technology. The Toy Train Depot and Museum, once a full size train depot, now over 100 years old and entertains all ages with the ride-on miniature train. The Tularosa Basin Historical Society Museum is a must see for historical buffs and those interested in the old west. The summer baseball season at Griggs Field hosts The White Sands Pupfish - a professional baseball club in the Pecos League of Professional Baseball Clubs. White Sands National Monument is just 14 miles outside of Alamogordo, where wavy dunes of gypsum cover over 270 square miles of the Chihuahuan Desert.

Alamogordo offers visitors and residence the option of more than 70 restaurants, 15 hotels, and over 30 retail options. Specialty stores and downtown shopping are located on New York Avenue. There is also much to do in neighboring cities of Cloudcroft, Tularosa, Ruidoso, Las Cruces, and El Paso.

Beginning in 2002, water supplies available to the City, and particularly surface water supplies, decreased dramatically.

In response, the City passed ordinances that provided for strict water restrictions and surcharges.

The restrictions were necessary to ensure the City had adequate water supply to meet essential services at the time.

The historical average diversions of surface water flows measured at the La Luz-Fresnal Flume, Alamo Canyon, and Bonito Lake Receival are: 3,318 AF La Luz-Fresnal, 1,257 Alamo Canyon, 1,539 Bonito Lake.
Bonito Lake is of particular interest to Holloman Air Force Bases regarding the partnership shared with the City of Alamogordo.

Bonito Lake is located approximately 15 miles northwest of the Village of Ruidoso, within the Lower Pecos River Drainage Basin. The Lake is owned and operated by the City of Alamogordo as a municipal water supply for Alamogordo, Holloman AFB, Carrizozo, Nogal, and Ft. Stanton. Although the Lake is not physically within the Tularosa Basin, a 90-mile long pipeline carries Bonito Lake water to Alamogordo and Holloman AFB. The City of Alamogordo and Holloman each own 1,448 AFY of water rights (2,898 AFY combined). Annual amounts of water diverted from Bonito Lake, which have been less than the combined right, are divided evenly between Alamogordo and Holloman AFB. Other entities owning Bonito Lake water rights, which total approximately 190 AFY, are Carrizozo, Nogal, and Ft. Stanton.

Bonito Lake was constructed in 1931 and drains a watershed of more than 21,000 acres (33sq mi). It was devastated by the 2012 Little Bear fire, which severely burned the majority of the Bonito Lake watershed, and rain storms following the fire, silted-in the reservoir to where it was inoperable. Efforts to reclaim Bonito Lake are in progress, but it may be five years to a decade before Bonito Lake will be able to fully supply water to Alamogordo and Holloman AFB.

The total firm yield of surface water sources indicates a potential minimum available supply of 2,525 AFY. During extreme drought conditions, the City of Alamogordo is prepared to not rely on any surface water supply.
The City of Alamogordo's ground water supply of five well fields consists of a reliable source firm ground water supply of 7,269 AFY, and will be considered the sole water supply for severe drought condition planning. Total use planned by 2055 is 11,584 AFY.

Average metered water deliveries totaled 3,982 AFY between 2006 and 2010. Of these metered water deliveries totaled 3,982 AFY between 2006 and 2010. Of these metered deliveries, residential use is approximately 80%, and commercial use is around 20%.

In February 2006, Alamogordo was awarded the U.S. Conference of Mayors Municipal Water Conservation Achievement Award after reducing per capital demand from about 261 gpcd in 1992 to meeting or exceeding the current goal of 165 gpcd.

Currently, Alamogordo is the only municipality in the State that has covered and lined our reservoirs and have instituted 100% use of reclaimed water during the bulk of the year. Citizens have already invested more the $65M in assets toward the treatment of reclaimed water for irrigation.

To reduce our vulnerability to prolonged drought conditions, contamination by accidental (fire, flood), emergency (chemical spill) or deliberate (terrorist) causes, the City of Alamogordo has invested in Desalination technology and infrastructure. This level of water planning is necessary to provide a safe and reliable water supply and protect public health and welfare. Implementation of Alamogordo's brackish water desalination will begin with one million gallons per day in 2017, and will expand to treat up to five million gallons per day by 2035. Of the $27M dollar project, $18M has been invested to-date.

City of Alamogordo Dark Skies Ordinance
Alamogordo's dark sky ordinance limits the emission of light pollution to protect aviation and astronomical observation. The ordinance sets forth restrictions and guidelines on the timing, orientation, and shielding of outdoor lights on public and private property.

As described in **Section 8**, dark sky ordinances can be a valuable tool in reducing compatibility issues associated with light pollution.

City of Alamogordo Comprehensive Plan
Created in 2012, the City of Alamogordo's Comprehensive Plan sets forth goals and policies to direct future growth and development. The majority of new development is on the city's periphery, which poses a greater compatibility challenge than growth within the core. The comprehensive plan, however, also emphasizes a strategy of infill development in built portions of the city, which would minimize the risk of future compatibility issues with nearby HAFB. The plan stresses the importance of monitoring and coordinating future development with WSMR and HAFB, particularly in areas west of the city adjacent to HAFB. Compatibility factors cited include the threat of incompatible land uses, as well as height and radio frequency issues for telecommunications projects in proximity to the military installations.

The plan also notes the critical roles of HAFB and WSMR in Alamogordo's economy. With HAFB as the city's largest employer, the local economy relies heavily on the military's presence and the comprehensive plan recommends more efforts to diversify the city's economic base for long-term growth and stability.

City of Alamogordo Zoning Ordinance
The City of Alamogordo's current zoning regulations outline ten zoning designations, including residential, commercial, manufacturing/industrial, and manufactured housing categories. The current zoning regulations do not reference military installations and have no special height, density, or use provisions pertaining to WSMR or HAFB.

Otero County Comprehensive Plan
Adopted in October of 2005, Otero County's Comprehensive Plan outlines the county's vision for future growth and development and is intended to guide decision-making related to cultural resources, natural resources, land use, housing, transportation, public services, facilities, and economic development. Population projections anticipate modest growth for the county in the coming years, with an additional 11,050 residents by the year 2030.

Federal entities strongly influence Otero County's land use patterns and economy. The federal government manages about 67 percent of the county's land area and the military provided 16 percent of jobs county-wide and constituted 30 percent of total earnings in 2002

Given the county's proximity and strong federal and military presence, Otero's Comprehensive Plan emphasizes the importance of coordination with state and federal entities and guiding future development in a manner compatible with the mission of adjacent military installations, particularly HAFB. The land use compatibility policies and goals identified in the plan build upon the recommendations from HAFB's AICUZ, completed in 2004. The plan sets the following specific land use goal:

- LU Goal 5. Ensure Holloman Air Force Base Mission is not jeopardized by incompatible growth. Holloman AFB is a significant contributor to the County's economy.
  - *Strategy a. Work with HAFB to promote further consideration of the Air Force Air Installation Compatible Use Zone (AICUZ) land use recommendations.*
  - *Strategy b. Adopt the Holloman Air Installation Compatible Use Zone as County policy and attach the report as a technical appendix to the County Comprehensive Plan.*
  - *Strategy c. Implement the Holloman Air Installation Compatible Use Zone through cooperation between adjacent landowners and the base.*

Otero County Subdivision Regulations
Otero County's subdivision regulations outline plat and review procedures for the subdivision of land within unincorporated Otero County. The regulations also set forth requirements for water quality and waste disposal, water use and conservation, terrain management, and streets, roads, alleys, and easements. Otero County's current subdivision regulations do not reference specific guidelines pertaining to proximity to military installations.

Chaparral Master Plan
The Chaparral Master Planning Process began in May 2012. This planning effort is a joint project between Doña Ana County and Otero County and the study will describe both portions of the Chaparral community.

3.2 Socorro County, NM

Northern Socorro County Comprehensive Plan
Northern Socorro County's Comprehensive Plan, adopted in 2006, guides physical development for the northern portion of the county. The plan focused only on this portion of the county due to dramatic population change. Although sparsely populated, with only 2,622 residents in 2000, Northern Socorro County experienced an increase of 55 percent in its population between 1990 and 2000. In contrast, the average growth rate for all of Socorro County was just over two percent for this time period.

In light of the higher relative growth rate, the Comprehensive Plan seeks to address economic development, transportation, community services and facilities, and land use issues. In particular, the plan seeks to protect farmland and open space, ensure orderly growth and development to maintain the county's rural character, and preserve the dark skies and quiet atmosphere, all of which could be compatible with nearby WSMR.

Socorro County Land Subdivision Regulations
Socorro County's subdivision regulations outline plat and review procedures for the subdivision of land within unincorporated Socorro County, including specific requirements for five subdivision types. The regulations also set forth requirements and standards for water quantity and availability, water quality, waste disposal and management, and terrain management. Socorro County's current subdivision regulations do not reference specific guidelines pertaining to proximity to military installations.

3.3 Doña Ana County, NM

Las Cruces Extra-Territorial Zone Comprehensive Plan 2000 - 2020
The Extra-Territorial Zone (ETZ) Comprehensive Plan is intended to guide development and land use decision-making in a joint planning area, which comprises a five-mile zone around the City of Las Cruces. The primary goal of the ETZ Comprehensive Plan is to provide for effective inter-governmental planning, coordination, and implementation of land use planning and development policies and investments. In addition to city and county coordination, the plan also emphasizes opportunities to align local planning efforts with state and federal entities.

City of Las Cruces Comprehensive Plan
Adopted in 1999, Las Cruces' Comprehensive Plan outlines the city's vision for future development and identifies core goals for each element of the plan, including land use, community facilities, urban design, utilities, economic development, housing, transportation, and the environment. The City of Las Cruces is currently updating their Comprehensive Plan.

City of Las Cruces, New Mexico Zoning and Subdivision Codes
The City of Las Cruces Zoning Code outlines regulations for 20 general zoning districts and 13 special zoning districts. The current zoning and subdivision regulations do not reference military compatibility and have no special height, density, or use provisions pertaining to proximity to military installations.

City of Las Cruces Extra-Territorial Zoning and Subdivision Codes (ETZ)
The Las Cruces Extra-Territorial Zoning Code and Extra-Territorial Subdivision Code set forth use and development requirements for all properties falling within the city's ETZ jurisdiction. The current zoning and subdivision regulations do not reference specific use or development requirements for properties in proximity to military installations.

The ETZ zoning code outlines the purpose and uses for general zoning districts and special districts. Zoning districts include designations for residential, commercial, industrial, conservation, village, and airport operations.

Doña Ana County Comprehensive Plan
Doña Ana County's Comprehensive Plan, adopted in 1994, is intended to guide land use and development decisions through the year 2015. The plan emphasizes opportunities

for inter-governmental cooperation, as well as coordination with state and federal entities, on land use, infrastructure, and development decisions. The Viva Doña Ana project will develop a new Comprehensive Plan for the county (see below).

One Valley One Vision 2040
Population forecasts estimate an increase of approximately 115,000 residents in Doña Ana County, yielding a total population of 325,000 by the year 2040. To accommodate this growing population, the One Valley One Vision plan, adopted in 2012, outlines planning goals and strategies for the communities within Doña Ana County.

The plan notes that population densities in communities adjacent to military installations are increasing and that planning decisions must consider land use compatibility in these areas. The plan also emphasizes the need for coordination with military installations, as well as other state and federal entities.

Chaparral Master Plan
The Chaparral Master Planning Process began in May 2012. This planning effort is a joint project between Doña Ana County and Otero County and the study will describe both portions of the Chaparral community.

Viva Doña Ana
Viva Doña Ana is a county-wide plan that seeks to build a more sustainable community through the livability principles of expanding transportation and housing choices, enhancing economic competitiveness, strengthening existing communities, coordinating policies and leveraging investments, and valuing communities and neighborhoods. The project will produce seven specialized plans, including a:

- Engagement and Education Program
- Comprehensive Plan
- Colonia Community Master Plan
- Border Economic Development Plan
- Corridor Management Plan
- Unified Development Code
- Regional Capital Needs Plan

The project began in February of 2012 and is scheduled to conclude by February of 2015.

Doña Ana County Zoning Ordinance
Unincorporated lands within Doña Ana County are divided into three zoning districts: Community Districts, Village Districts, and Performance Districts. Each of these districts contains specific zoning designations. A Community District is typically a large area that has experienced rapid growth. Developers can request the establishment of a Community District to create planned developments. Performance Districts require that development and land uses meet specific development standards, including buffer requirements. The zoning ordinance also sets forth guidelines for Planned Unit Developments. The county's zoning is being updated as part of the Unified Development Code component of the ongoing Viva Doña Ana effort.

Doña Ana County Subdivision Ordinance
Adopted in 1996 and amended in 2007, the Doña Ana County Subdivision Ordinance governs all subdivision of land outside of municipal boundaries. The ordinance sets forth plat and review procedures, establishes design and construction standards and mandatory improvements, including road development, and requires protection of cultural properties and archeological sites. The current subdivision regulations do not reference specific guidelines pertaining to proximity to military installations. As with county zoning, subdivisions regulations will be updated within the new Unified Development Code.

3.4 Lincoln County, NM

Lincoln County Comprehensive Plan
The comprehensive plan projected population growth to almost 30,000 residents by 2030, an increase of approximately 50 percent above its current population. The county anticipates that the majority of growth will occur in and around the cities of Ruidoso, Ruidoso Downs, and Capitan. The land use goals established in the Comprehensive Plan seek to maintain the county's small town and rural character, manage growth, and conserve natural resources.

Lincoln County Subdivision Ordinance
Adopted in 2006, Lincoln County's Subdivision Ordinance outlines plat and review procedures for the subdivision of land within unincorporated Lincoln County. The ordinance also sets forth requirements and standards for required improvements, flood control and drainage, water availability, water conservation and fire protection, waste management,

and terrain management. Lincoln County's current subdivision regulations do not reference specific guidelines pertaining to proximity to military installations.

3.5 Sierra County, NM

Sierra County Comprehensive Plan
Adopted in 2006, the Sierra County Comprehensive Plan outlines the county's existing conditions and sets forth strategies to guide future growth and development, while preserving the area's quality of life. The plan addresses the following elements: land use and code enforcement, economic development, water, infrastructure, transportation, and housing.

The majority (67.7 percent) of Sierra County's land area is federally owned, while 18.9 percent is privately owned, and 13.4 percent is held in state trust. Spaceport America and WSMR combine to form a major physical presence in the county. Agriculture and recreational tourism are the county's key economic engines.

With only a flood control ordinance and a subdivision ordinance, Sierra County intentionally has few land development restrictions or ordinances. The Comprehensive Plan outlines objectives and strategies for strengthening the subdivision ordinance and establishing other incentives to maintain the appearance and environmental integrity of the county, while maintaining flexibility for development and land use. The plan also emphasizes the need for multi-jurisdictional infrastructure and transportation planning efforts coordinated at the local, state, and federal levels.

Water planning issues are central to the long-range comprehensive planning process. Citing the Sierra-Socorro Regional Water Plan, the Comprehensive Plan projects a growth rate of approximately 70 percent by the year 2040 for Sierra and Socorro Counties. The plan outlines strategies to conserve water supplies to meet future demands associated with such significant population growth, including consumer conservation education and incentives, preservation of county water rights, the acquisition of additional water rights, and agricultural water conservation policies.

Transportation and connectivity was also central to the county's comprehensive planning process. Sierra County is bisected by Interstate 25, which runs north-south through the center of the county. No other public roads provide internal north-south access. No roads directly connect Sierra County to adjacent counties to the east and NM 152 is the only paved connection to the west. Studies conducted by the South Central Regional Planning Organization (RPO) note that population growth in Sierra County has been concentrated in the unincorporated areas west and south of the City of Truth or Consequences. Areas of growth have been identified in the Arrey/Derry areas, as well as the dispersed valley communities. As these areas continue to grow, demands on the county's limited transportation system will increase. Additionally, annual tourists and recreation visitors, especially in the Elephant Butte area significantly affect the county's transportation facilities.

Sierra County Subdivision Ordinance
Adopted in 1996 and amended in 1999, Sierra County's Subdivision Ordinance outlines plat and review procedures for the subdivision of land within unincorporated Sierra County and establishes five subdivision types based on the number of units and lots per acre. The general requirements set forth under the ordinance include sufficient water quantity, a liquid and solid waste management plan, entry and exit to each parcel, provisions for appropriate utility easements, a terrain management plan, and the protection of cultural properties.

3.6 El Paso County, TX

Plan El Paso
The City of El Paso's Comprehensive Plan, adopted in 2012, outlines existing conditions, emerging community concerns, strategies for addressing community concerns, and goals and policies to implement the city's planning strategies. The plan is guided by the goals related to sustainability, attractive urban design, walkability and physical connectivity, complete neighborhoods, quality infrastructure and housing, economic prosperity, health and historic preservation. The plan also contains goals that are specific to the city's close relationship with Fort Bliss:

- *Regional Land Use Patterns: Encourage infill develop¬ment within the existing City over peripheral expansion to conserve environmental resources, spur economic in¬vestment, repair social fabric, reduce the cost of providing infrastructure and services, and reclaim abandoned areas.*

- *Fort Bliss: The City and Fort Bliss shall continue to grow together in a way that is mutually beneficial.*

El Paso's plan includes a section dedicated to coordinated planning strategies with Fort Bliss. The installation plays a critical role in the local economy and a significant portion of the city's population consists of military staff, personnel, and families. The presence of Fort Bliss affects El Paso's housing, education, and health care services, in addition to the city's land use planning efforts. The plan emphasizes strategies to provide quality services and to ensure land use compatibility in the communities adjacent to the installation.

El Paso Regional Growth Management Plan

The El Paso Regional Growth Management Plan outlines the physical, economic, and social systems within the El Paso region and their ability to support expanded missions for WSMR and Fort Bliss and the large growth resulting from the 2005 Base Realignment and Closure (BRAC). The plan builds on past studies, local economic forecasts and models, experiences of other regions affected by the BRAC process, and feedback received through community engagement.

The document outlines challenges, growth impacts, and recommendations for ten elements: economic development, land use, transportation, public utilities and infrastructure, housing and market conditions, education, health and social services, public safety and emergency services, quality of life, and fiscal impact. The plan specifies housing, education, and health care as major emerging issues to be monitored and addressed as the region prepares for development and growth.

The plan anticipated a net increase in troops of approximately 25,000 along with the addition of more than 34,000 family dependents. As a result of the 2005 BRAC, the number of military personnel rose steadily from 11,400 in 2005 to 35,411 in 2013 (see **Table 7.3**). Such significant growth at Fort Bliss has had implications on regional demand for housing, transportation, and infrastructure. The plan also highlights land use challenges resulting from the region's projected population growth and emphasizes the need for coordination with Fort Bliss to ensure new development occurs in a manner that complements the installation's mission.

Areas of Growth

Population projections estimate that by the year 2025 the county population would exceed one million, with the City of El Paso accommodating over 919,000 residents. The region is already experiencing significant growth—citywide, there were 8,333 lots under development at the time of the plan. According to the study, much of this new growth is occurring in the northwest along the I-10 corridor and close to the Franklin Mountains. Additionally, permitting records indicate that there are 43 newly constructed subdivisions in the west/central portion of the El Paso region, with 1,938 lots under development. The plan also notes an increase in development activity in the northeast, where 24 new subdivisions were under construction at the time of the plan. In the east, the plan reports the platting of 30 new subdivisions with 3,603 lots. Since 2000, El Paso issued an average of 3,115 single family building permits per year.

Phase 2 of the growth plan illustrates areas of anticipated growth. These growth areas are concentrated along the eastern edge of the region, south of Fort Bliss and east of Highway 375; along the northwestern boundary, east of Franklin Mountains State Park and south of Highway 375; and along the north-central edge of the region, immediately east of the Franklin Mountains State Park and north of Castner Range.

As communities in the El Paso region continue to grow and expand, coordination with Fort Bliss becomes more critical. The plan sets forth the following land use recommendations to guide coordinated development:

- Identify the Army Compatible Use Buffer (ACUB) Plan provisions and land use strategies to protect critical interface areas with Fort Bliss;
- Take into account the impacts from residential development on training operations at the installation;
- Develop regulations to mitigate any detrimental impacts through design criteria and planning features; and
- Continue to implement the ACUB program as a high priority in order to restrict allowable land uses in areas at risk of encroachment, which will require local and regional support.

Growth and Infrastructure

The plan's transportation and infrastructure analysis details strategies to enhance the region's multi-modal transportation system, targeting commuting options to and from significant residential and employment centers, trip reduction, intermodal facilities, and enhanced pedestrian and bicycle access. The plan emphasizes the need to plan and direct future growth toward areas with existing transportation and infrastructure systems to minimize the need for new facilities

and to coordinate future transportation investments with the anticipated needs resulting from the expansion of Fort Bliss. The proposed projects highlighted below were specifically designed to improve access to Fort Bliss and to alleviate traffic congestion and enhance traffic flow and safety in one of the most rapidly growing areas of El Paso.

- Construction of Inner Loop/Spur 601, a 9.5 mile long route beginning at the junction of U.S. 54 at Fred Wilson and extending Fred Wilson east to terminate at Loop 375 (Construction Start-Fiscal Year 2006).

- Construction of full service interchanges along Inner Loop/Spur 601 at Global Reach Drive and Loop 375 (Construction Start-Fiscal Year 2006).

- Construction of a full intersection at Inner Loop and Airport Road/Sergeant Major Boulevard (Construction Start-Fiscal Year 2006).

- Construction of three new Access Control Points: one at Global Reach, one gate (Harmon Gate) west of Loop 375 and another east of Loop 375 (Construction Start-Fiscal Year 2005).

- Construction of two temporary gates east and west of Loop 375 for construction purposes.

The plan includes the following recommendations pertaining to infrastructure planning:

- Infrastructure improvements should be prioritized by growth area with improvements focused in those areas where off-post military housing is most likely to be concentrated; the Eastside and Northeast planning areas.
- The City and County of El Paso should explore entering into a cooperative agreement similar to Doña Ana County and Las Cruces to address solid waste management issues regionally.

Water

The total non-agricultural demand for water in El Paso County is projected to reach 193,820 acre feet per year (AF/yr) by the year 2020. El Paso County's current water sources include the Rio Grande River, local groundwater, and water reclamation or reuse. These sources combined currently produce 150,000 AF/yr for non-agricultural use. El Paso County's strategy to meet the future water demands through the year 2020 includes efforts to increase conservation and use of reclaimed water, surface water from the Rio Grande River, and local groundwater.

City of El Paso Zoning Ordinance & City of El Paso Subdivision Ordinance

The City of El Paso Zoning Ordinance and Subdivision Ordinance outline the development and use requirements for all properties falling within the City of El Paso. The current zoning and subdivision regulations do not reference height, density, or use guidelines for properties in proximity to military installations.

The zoning ordinance outlines the purposes and uses of 25 zoning districts, as well as the associated administrative and special permitting procedures. El Paso's zoning ordinance includes three residential districts, three commercial districts, and two industrial and manufacturing districts, all with sub district designations. The ordinance also outlines provisions for 11 special purpose districts.

El Paso County Subdivision Regulations

El Paso County's Subdivision Regulations outline the development and administrative provisions for land subdivision in El Paso County. The regulations apply to the subdivision of property that 1) creates two or more lots of five acres or less and 2) is intended for residential purposes. El Paso County's regulations set forth provisions for water facilities and waste disposal, setbacks, road and lot arrangement, and the plat approval process. The regulations do not outline specific standards or requirements pertaining to properties adjacent to military installations.

3.7 Colonias and Unincorporated Areas of Counties

While cities typically possess the legal authority and resources to actively promote compatibility through land use actions, colonias and other unincorporated county areas often lack such regulatory and resource access and thus can pose a special challenge in developing land use and planning strategies around military installations.

Colonias

The U.S. Department of Housing and Urban Development defines colonias as rural communities and neighborhoods within 150 miles of the U.S.-Mexican border that frequently do not have adequate infrastructure and basic services. Other federal and state agencies, including the U.S. Department of Agriculture Rural Development, the U.S. Environmental Protection Agency, and the New Mexico Colonias Infrastructure Board offer varying definitions of these communities.

Though rich in culture and history and often very dynamic in terms of economic and population growth, these communities typically lack adequate roads, sanitary-water and sewer

systems, minimum property standards, street lighting and similar public infrastructure. Colonias may also struggle to obtain the resources to engage in proactive planning to address compatibility issues related to installation proximity. The lack of land use regulatory authority in colonias further highlights the importance of county-wide planning as a vehicle to govern development patterns.

The community of Chaparral is a colonia that straddles Doña Ana and Otero Counties just south of the Doña Ana Range on Fort Bliss. This rapidly growing community experiences noise exposure from nearby Fort Bliss range operations. Various local, state, federal and community-based entities fund efforts to improve conditions in the region's colonias and strengthen their planning and coordination capabilities.

Extra-Territorial Zone or Jurisdiction

The cities and counties of the region conduct joint planning in specifically designated areas. As noted earlier, New Mexico State Statute allows for joint planning in areas outside of incorporated cities, villages, and towns to address growth beyond municipal limits.

The Las Cruces ETZ, created in 1989, is a five-mile planning and platting boundary with its own subdivision, zoning, and Comprehensive Plan. County staff primarily reviews development within this area, except for new subdivisions, which fall under the city's purview. The ETZ has its own Commission and Extra-Territorial Zoning Authority to facilitate coordination and administration of growth management, zoning, land use, and subdivisions. The City of Las Cruces and Doña Ana County are currently in the process of reviewing the ETZ structure and exploring the possible transfer of subdivision authority. Under this arrangement, the area would fall fully under the administration of the county. The City of Alamogordo administers subdivisions regulations within a five mile ETZ around its municipal boundaries. The City of Sunland Park, just west of El Paso, has planning jurisdiction for up to two miles beyond its corporate limits. Both Doña Ana County and the City of Sunland Park participated in the creation of the Camino Real Regional Utility Authority (CRRUA), an independent utility responsible for the provision of water and wastewater services in the rapidly growing southern area of the county.

Unincorporated Areas

Doña Ana County is the only county government in the JLUS study area that zones land in areas outside of incorporated cities in the county. All county governments, however, administer basic subdivision regulations. This lack of zoning reflects a strong private property rights outlook in rural portions of the region and is not the result of state-imposed constraints within the State of New Mexico.

In Texas, however, only cities have the authority to adopt zoning ordinances. Counties, in contrast, must receive express legislative approval to regulate land uses. Counties can exercise narrowly granted zoning authority around specific features such as reservoirs, military installations, historic sites, airports, and communication facility structures. Current law thus suggests opportunities for state-level legislative initiatives to increase access to regulatory tools in El Paso County.

Mesilla Valley

04 OVERVIEW OF STAKEHOLDER ENTITIES AND SIGNIFICANT REGIONAL PROJECTS

Along with city and county governments and the three military installations, state, federal and tribal entities play a role in managing airspace and land resources in the JLUS study area. This section summarizes their mandates and strategic goals along with major regional projects that could affect compatibility within the study area.

4.1 Spaceport America

Background

Spaceport America is the first purpose-built facility in the world designed to accommodate commercial space flight. The site is located in Sierra County, New Mexico, about 55 miles north of Las Cruces and 30 miles southeast of Truth or Consequences. The New Mexico Spaceport Authority (NMSA) operates the facility, which is designed to accommodate horizontal and vertical launches of suborbital launch vehicles (SLVs). The vehicles may carry space flight participants, scientific experiments, or other payloads. Spaceport America is fully owned by the State of New Mexico and its citizens. The cost of the project is approximately $209 million with funding from both the state and Sierra and Doña Ana Counties.

The NMSA envisioned Spaceport America as a long-term economic development driver of high technology, tourism, and educational opportunities for Southern New Mexico. The site was chosen due to such inherent advantages as a dry and sunny climate, 4,500-foot launch pad elevation, low population density in surrounding areas, contiguous sections of available land, and access to the restricted airspace over nearby WSMR.

The final footprint of facilities is approximately 145 acres and the overall boundary encompasses approximately 26 square miles. All of the facilities are set on state-owned land and the adjacent area features hundreds of square miles of open land with a variety of vegetation and habitat types. White Sands Missile Range lies 11 miles to the east, creating a long-term buffer. The surrounding area includes mostly BLM-administered land, along with a mix of additional State Trust and private lands. The NMSA secured long-term access for Spaceport America through agreements with the New Mexico State Land Office, the BLM, Sierra County, and two private ranch operations.

Spaceport America's primary compatibility concerns with its surroundings revolve around launch safety, airspace, and radio frequency spectrum uses. During launches, specific areas must be clear of non-participating persons and vehicles, both in the air and on the ground. As a result Spaceport strongly values undeveloped adjoining land, making it a highly compatible overall use with nearby military testing and training activities.

Environmental Impact Statement

The Federal Aviation Administration (FAA) along with other cooperating agencies completed an Environmental Impact Statement (EIS) in November of 2008. The EIS addresses the environmental impacts of constructing and operating a launch facility and all reasonably foreseeable related activities and uses.

According to the EIS, the only resource area for which the impact from the Proposed Action (the operation of both horizontal and vertical suborbital LV launches) would exceed the applicable threshold of significance is historical, architectural, archaeological, and cultural resources. A Programmatic Agreement is in place to address these impacts. Since the actual land area disturbed for launch operations is limited to those lands converted from rangeland to vertical and horizontal launch and support facilities and areas on WSMR, the direct land use impact is considered minimal.

The analysis identifies some indirect and cumulative impacts of operations, including water, noise, air emissions and visual effects generated by vertical or horizontal launch activities and non-launch activities. Effects would be minor and intermittent and would not result in a substantial impairment of current land uses. Recreational uses of the State Trust and BLM lands would continue, through there may be some restriction in access to protect facilities and maintain safety. Water usage and drawdown calculations of Spaceport development and operations, when combined with past, current, and future projects indicate that cumulative impacts on groundwater quantity are not likely be significant.

Current and Foreseeable Operations

Development of Spaceport America infrastructure is scheduled in two phases with Phase 1 now complete. This initial phase developed such basic operational infrastructure as an airfield, launch pads, terminal/hangar facility, emergency response capabilities, utilities and roadways. Phase 2, part of which is complete, includes runway extension, visitor accommodations, and road improvements to the south.

Spaceport America is a revenue-producing State of New Mexico asset in which tenants pay for expenses and fees to the state. The local governments in turn receive gross receipts taxes, 75 percent of which must be dedicated to the financing, planning, designing, engineering and construction of a regional spaceport district. No more than 25 percent of the revenue may be allocated to other spaceport-related projects as approved by resolution. The facility will have an on-site center with visitors arriving by shuttle to limit potentially incompatible spin-off development, such as lodging, within safety zones and to minimize direct effects on archeological and historical resources.

Earlier analyses including the EIS anticipated that visitors and tourists would generate significant revenue for the state and local businesses. Since the commercial space industry has been subject to considerable fluctuation, the full economic benefits have materialized more slowly than forecasted. Nonetheless, during peak construction, contracts supported about 1,100 jobs and about 2,000 jobs are expected over the next 3 years. The site itself will sustain about 100 full-time positions when fully operational.

The main anchor tenant, Virgin Galactic, remains focused on space tourism with anticipated commercial flights beginning in 2014. Spaceport America has had about 20 launches to date with an operational tempo of about four flights per year. The frequency of launches is expected to increase with continued development. A higher launch frequency will intensify some of the compatibility factors that have been identified, particularly airspace coordination.

4.2 Bureau of Land Management (BLM)

Background

The BLM is an agency within the United States Department of the Interior that administers public lands and resources based on the principle of multiple use and sustaining the health, diversity, and productivity for present and future generations.

The BLM Las Cruces District Office manages 5.4 million acres of public land in Sierra, Otero, Doña Ana, Hidalgo, Luna, and Grant Counties in southern New Mexico. Resources in the district include:

- 25 Wilderness Study Areas (480,095 acres)
- 28 Areas of Critical Environmental Concern (205,496 acres)
- Prehistoric Trackways National Monument (5,280 acres)
- Robledo Mountain Paleozoic site
- 3 developed recreation sites that host more than 200,000 visitors annually (Three Rivers Petroglyph Site, Dripping Springs Natural Area and Aguirre Spring Recreation Area)
- Over 30 miles of riparian habitat
- Over 500 species of wildlife, including 147 special status and 22 Threatened/Endangered species

The BLM Socorro Field Office manages public land in Socorro and Catron Counties, including the Fort Craig Historic Site, Gordy's Hill Area, Quebradas Backcountry Byway, San Lorenzo Canyon, Socorro Nature Area and the Box Recreation Area. The Roswell Resource Area Office of the BLM encompasses all of Lincoln County, along with Chaves, DeBaca, Roosevelt, Curry, Quay, and Guadalupe Counties in southeastern and east-central New Mexico.

The BLM manages special recreation permits; grazing allotments; major power, pipeline and communications rights-of-way; land sales, exchanges, and Recreation and Public Purposes (R&PP) Act leases and transfers; geothermal, oil and gas, copper, mineral materials, and mining claims; operational maintenance of facilities, structures, roads and trails; wildfire suppression; and cultural and natural resource protection.

The Federal Land Policy and Management Act (FLPMA) states that *"Provided, That unless otherwise provided for by law, the Secretary may permit Federal departments and agencies to use, occupy, and develop public lands only through rights-of-way under section 507 of this Act, withdrawals under section 204 of this Act, and, where the proposed use and development are similar or closely related to the programs of the Secretary for the public lands involved, cooperative agreements under section (b) of section 307 of this Act".*

McGregor Range which is a 606,157-acre range located in Otero County consists of public land managed by the BLM. This land has been withdrawn by legislation from the public domain for military use and is subject to special restrictions. However, the BLM continues to manage 14 existing grazing units on McGregor Range consistent with military training priorities.

TriCounty Draft Resource Management Plan/Environmental Impact Statement

The planning area for the TriCounty Draft Resource Management Plan/Environmental Impact Statement (RMP/EIS) consists of about 9.3 million acres of federal, state trust, private and tribal lands in Sierra, Otero, and Doña Ana Counties. The RMP/EIS revises the White Sands RMP completed in 1986 and amends the 1993 Mimbres RMP. The new document is intended to provide a more comprehensive framework for management guidance and reflect changes in demographic characteristics and the increased use of public land.

The previous Mimbres RMP identified a large area of the public land between Las Cruces and the Organ Mountains as suitable for disposal. The Draft RMP/EIS cites an increased interest in retaining public land in federal ownership in this area and specifically notes that the existing RMPs did not adequately address the impacts of potential land disposals on adjacent military operations, grazing leases, and local communities.

The RMP will establish consolidated guidance and updated objectives and management actions for the public land within the TriCounty area over the next 15 to 20 years. The draft document was available for public comment through November 4, 2013. The entities formally cooperating in the planning process include the City of Las Cruces; Sierra, Otero, and Doña Ana Counties; Fort Bliss; and WSMR.

BLM and other state and federal agencies and stakeholders identified a series of preliminary issues for the plan. Several of the issues, especially the disposal of lands near military operations and renewable energy development are pertinent in the JLUS context.

Based on BLM priorities and issues, the draft RMP set the following goals:

- Manage for long-term sustainability and to meet the Standards for Public Land Health for Upland Sites, Biotic Communities, and Riparian Sites;
- Within the capability of the Planning Area's natural and cultural resources, provide tourism, recreational, educational, and research opportunities;
- Provide for production of goods and services from the public land, while protecting the natural and cultural resources of that land for future generations;
- Within the capability of the Planning Area resources, provide a predictable, sustained flow of economic benefits to individuals and local communities; and
- Work with local American Indian Tribes and local communities to meet their needs within the mission of the BLM.

The BLM also establishes planning criteria to direct the RMP process and guide plan development, including selection of the preferred alternative. Consideration of the importance of military missions is one of 24 such overarching criteria. The number and complexity of the planning criteria point to the array of interests and needs to be balanced within the RMP process.

The RMP/EIS analyzes the impacts of four management alternatives:

- Alternative A (No Action Alternative): Continues management direction according to decisions in the existing White Sands RMP and Mimbres RMP.

- Alternative B: Emphasizes conservation and preservation of resources and places the most restrictions on resource use. With this alternative, the BLM would manage and conserve resources for long-term use.

- Alternative C (Preferred Alternative): Aims for a balance between long-term conservation and the mandate to provide for multiple use. Measures to protect sensitive resources would be implemented, but they would be less restrictive than under Alternative B.

- Alternative D: Stresses more aggressive resource use, access, and production with resource protection only to the point necessary to meet regulatory or legislative requirements.

The RMP/EIS analyzes impacts across a wide range of areas and uses, including air, soil and water, vegetation, habitat, special status species, cultural and visual resources, grazing, recreation, minerals, lands and realty and renewable energy. Given their particular relevance, this summary of the RMP/EIS focuses on impacts related to lands and realty and energy issues.

Land Disposal

In managing the approximately 2.82 million acres of public land (surface estate) within the planning area, the BLM provides for land uses through purchase, exchange, lease, donation, sale, and withdrawal. Land tenure adjustments are often associated with accommodating public and private needs, community expansion, consolidating public land, acquiring and protecting important resources, obtaining access to public land, or serving a national priority.

Although the RMP/EIS identifies public land as suitable for disposal or withdrawal such land may not actually be transferred. Land disposal by the BLM is a discretionary action and subject to additional analysis under the National Environmental Policy Act (NEPA) process. However, only land in identified areas would be available for potential disposal.

Public land with high resource values including Wilderness Study Areas (WSA), Areas of Critical Environmental Concern (ACEC) and lands with wilderness characteristics outside of WSAs would generally be retained in public ownership and managed for multiple use.

Under Alternative A, approximately 213,000 acres would be allocated for disposal from BLM administration, equaling 7.5 percent of the public land included in the RMP. Land identified includes areas east of I-25 and I-10, around the Chaparral and Anthony communities and areas along U.S. 54 near Tularosa. Alternative B includes approximately 38,273 acres for disposal, representing an 80 percent decrease from Alternative A. Lands identified include small, scattered pockets near Las Cruces and Doña Ana, east of Timberon and south of Tularosa. Under Alternative C, 108,450 acres could be transferred from BLM administration with designated areas around I-10, Chaparral, Timberon and Tularosa. Alternative D identifies a total of 186,523 acres (41,557 acres in Sierra County; 39,860 acres in Otero County; and 105,106 acres in Doña Ana County) of public land as available for disposal. Alternative D includes the greatest amount of land that could potentially be transferred from federal ownership.

Renewable Energy

Rights-of-way for renewable energy, such as wind, solar, biomass, and other alternative energy sources are authorized under the Lands and Realty Program within the BLM. The Energy Policy Act of 2005 establishes a goal for the Secretary of the Interior to approve 10,000 megawatts of electricity from non-hydropower renewable energy projects on public land. The goal of the BLM is to provide direction for the development of renewable energy projects, including potential locations and management parameters. As part of this effort, the BLM has completed three previous programmatic EIS documents: Wind Energy Development Programmatic EIS (BLM 2005b); Solar Energy Development Final Programmatic EIS (BLM 2012c); and the Final Programmatic Energy Corridor EIS (BLM 2008c).

The draft RMP would restrict the placement of renewable energy projects by delineating avoidance and exclusion areas. Project siting is deemed undesirable in avoidance areas because of environmental impacts but could proceed with certain stipulations. Exclusion areas are those areas where projects would not be allowed unless required by law. Areas not identified as avoidance or exclusion would be open for energy development on a case-by-case basis. The amount of area closed or restricted varies across the alternatives.

Under Alternative A for the BLM RMP, 532,000 acres would be avoidance or exclusion areas for both solar and wind energy projects. Applications for utility scale solar or wind energy projects would be accepted, processed, and analyzed on a case-by-case basis as a FLPMA right-of-way.

Alternative B would prohibit rights-of-way authorizations in exclusion areas on approximately 920,000 acres. Alternative C reduces exclusion areas compared to Alternative B from 920,000 acres to 343,000 acres and thus would give greater flexibility in the placement of transmission lines, communication sites, renewable energy facilities and other rights-of-way authorizations. Under Alternative D, only special designations, WSAs, ACECs, El Camino Real Historic Trail and Visual Resource Management Class I areas, would be excluded from wind energy development. This would be more area than under Alternatives B and C but less than that available under Alternative A.

4.3 New Mexico State Land Office

Background

The New Mexico State Land Office (NMSLO) manages approximately 9 million acres of surface and 13 million acres of mineral estate for 21 trust beneficiaries. The NMSLO operates under a constitutional mandate to optimize revenue for these trust beneficiaries through the highest and best use of State Trust Land. In Fiscal Year 2013, trust lands produced about $577 million in income. Beneficiaries of the trust include public schools, universities such as New Mexico State University, hospitals, and other public institutions. About 94 percent of the revenue generated by the Land Office goes to support education, which covers about 22 percent of the operating budget of public schools throughout New Mexico, including more than $55 million to the school districts of Doña Ana, Otero, Lincoln, Socorro, and Sierra counties and the municipalities within those counties. More than $11 million is contributed annually for the support of the School for the Blind and Visually Impaired, Alamogordo–94 percent of the school's operating budget.

The NMSLO has land holdings and leases throughout the JLUS study area, including approximately 1.6 million surface acres and 2.46 million subsurface acres within Doña Ana, Otero, Lincoln, Socorro, and Sierra Counties. Spaceport America and portions of the proposed SunZia transmission corridor routes are on State Trust Land.

Commercial Resources

State Trust Land may be exchanged, sold or leased for activities such as commercial development, renewable energy or oil, natural gas, and minerals production as part of transactions with other governmental entities or the private sector. Consistent with the agency mandate, these transactions must result in a higher and better use of holdings for the trust and its beneficiaries. More than 50,000 acres of trust land state-wide is currently in the path of urban development. Planning and Development leases enable the NMSLO to partner with the private sector to develop residential, commercial or industrial projects or mixed use communities on acreage adjacent to growing urban areas.

The School for the Blind and Visually Impaired, Alamogordo

As part of the Community Partnership Program, the NMSLO collaborates with local governments to make trust lands available for business and industrial parks, recreational facilities, open space, and housing. Trust lands are not subject to local land use regulations, but joint planning agreements (JPA) provide a strategic framework to promote coordinated, long-term planning between the NMSLO and local entities. The NMSLO entered into a JPA with the City of Las Cruces and Doña Ana County. The March 2013 JPA with the county establishes a cooperative working relationship for marketing state trust lands for economic development purposes and pledges collaboration between the NMSLO and county before any long-term lease, sale or exchange of state trust land occurs.

Renewable Energy

The NMSLO has targeted renewable energy as a major growth industry within the state. Long-term leases for the development of solar and wind projects represent an opportunity to generate significant income for trust beneficiaries. The agency is currently creating a list of trust lands suitable for various renewable energy projects. Significant solar and wind resources for renewable energy development on trust lands exist within Doña Ana, Lincoln, Otero, Sierra and Socorro Counties and adjacent counties.

4.4 U.S. Forest Service

Background

The United States Forest Service (USFS) is an agency of the United States Department of Agriculture that administers the nation's 155 national forests and 20 national grasslands.

The mission of the USFS is to sustain the health, diversity, and productivity of the Nation's forests and grasslands to meet the needs of present and future generations. The USFS manages lands and resources to restore and maintain species diversity and ecological productivity in support of recreation, water, timber, minerals, fish, wildlife, wilderness, and aesthetic values.

The USFS has a major presence in the JLUS study area with the Lincoln National Forest, Cibola National Forest, and Gila National Forest. The Lincoln National Forest is in the eastern portion of the region and is in closer proximity to military operations than the Gila. The Lincoln National Forest consists of three ranger districts, encompassing three mountain ranges and over one million acres in parts of four counties. The forest features many high quality recreational areas, including the Capitan Mountains Wilderness Area, the White Mountain Wilderness Area, the Sitting Bull Falls Recreation Area and the Trestle Recreation Area.

A portion of McGregor Range overlaps with USFS land and is used for training and joint exercises and the Forest recently cooperated with WSMR on the Network Integration Exercise on base.

In 1986, the USFS adopted the Lincoln National Forest Land Resource Management Plan. The management plan outlines guidance for managing the Lincoln National Forest and seeks to balance forest and environmental integrity with resource management and productivity. The plan includes goals and guidance for the management of timber, wilderness access and quality, wildlife and fish, range and grazing, recreation, mineral exploration, water and soils, public lands, facilities, resource protection, and human and community development.

Along with its wildlife management responsibilities, the USFS accommodates an increasing level of recreational activity in the forest. High elevations make Lincoln Forest sites popular outdoor destinations, drawing about one million visitors yearly. In 2014, the USFS will conduct a survey of users to better inventory recreational functions in the forest and estimate visitor expenditures for the peak season.

Lincoln National Forest, White Sands

4.5 National Park Service

Background
The National Park Service (NPS) is an agency of the United States Department of the Interior that manages all national parks, many national monuments, and other conservation and historical properties. The NPS mission is to preserve the natural and cultural resources and values of the national park system for the unimpaired enjoyment, education, and inspiration of this and future generations.

The NPS owns and operates the lands comprising White Sands National Monument (WHSA), located adjacent to HAFB and surrounded by WSMR. White Sands National Monument spans 144,000 acres in parts of Doña Ana and Otero Counties and is bordered on the west by the San Andreas Mountains and by the Sacramento Mountains to the east. The purpose of the WHSA is to protect the geologically unique gypsum dune fields, and the flora and fauna living within them, while providing compatible educational, research, and recreational opportunities. The monument is the most visited National Park site in New Mexico and the largest NPS area in the state.

The NPS has multiple reports to direct the management of the monument's natural resources and guide operations, including accommodating its annual visitors and coordinating with adjacent entities, such as WSMR, HAFB, and local jurisdictions.

Physical Resources Foundation Report
Created in 2009, WHSA's physical resources report outlines the monument's purpose, critical physical resources, and the laws and policies that support resource management.

White Sands National Monument, New Mexico

The report identifies the pure white gypsum dune fields and water as its most fundamental resources, requiring the highest level of preservation. The monument site preserves 115 square miles of the world's largest gypsum dune field, which is home to many significant and rare biological and geological resources. Groundwater is critical to the stability of the monument's dunes and hydrologic processes. An extremely high aquifer provides moisture for the dunes and prevents them from drying and blowing away.

White Sands National Monument Cultural Landscapes Inventory (CLI)
Completed in 1995, the WHSA CLI presents an overview of historically significant landscapes within the site's boundaries. The CLI aids the NPS in managing the parks system's lands and resources. The goals of the CLI are to identify and increase the number of certified culturally significant landscapes and maintain and/or improve the condition of certified cultural landscapes.

White Sands National Monument currently has one certified cultural landscape–the White Sands National Monument Historic District. The Historic District was listed on the National Register in 1988 and the designation primarily emphasized the district's historic buildings. The 1995 CLI expands the nomination to consider the site's views and vistas, vegetation, and spatial organization.

White Sands National Monument Management Strategy
Completed in 2009, the WHSA Management Strategy outlines the monument's fundamental resources and values, including its geologic, historic, cultural, and educational resources, primary interpretive themes, and recommendations on how to highlight each of these elements. The strategy includes six areas of focus: gypsum dune fields and adjacent desert communities; rich flora and fauna; archeological history and prehistory sites; research and education; the visitor experience; and cooperation and partnering opportunities. The cooperation and partnership element emphasizes communication and collaborative opportunities with HAFB and WSMR, as well as surrounding communities, tribal nations, and other state and federal government entities.

4.6 Tribal Governments

Mescalero Apache Tribe
The Mescalero Apache Reservation spans approximately 719 square miles and is bordered by the Sacramento Mountains and Lincoln National Forest, with the majority of its land area located in Otero County. The Mescalero Apache Tribal Council manages the reservation's natural resources and development. The reservation's major economic generators are ranching, tourism, the Inn of the Mountain Gods Resort and Casino, and Ski Apache.

Ysleta del Sur Pueblo (Tigua)
Located in the Cities of El Paso and Socorro, Texas, Ysleta del Sur Pueblo (Pueblo) is home to the Tigua tribal community, with over 1,700 citizens. The Pueblo encompasses over 2,600 acres of land. The Tribe also owns the Chilicote Ranch, which is comprised of over 70,000 acres and houses the Tribe's cattle ranching operations. The Pueblo is active in El Paso's regional economy and is currently involved in many local economic development initiatives.

Piro-Manso-Tiwa Tribe of Guadalupe Pueblo
The Piro-Manso-Tiwa Tribe of Guadalupe Pueblo is in Las Cruces, New Mexico. The Tribe originated from the Pueblo Indians of the Guadalup Mission of Paso del Norte, whose descendants were among the first settlers of Las Cruces. The Piro-Manso-Tiwa Tribe formally organized as a non-profit corporation in 1998.

Alamo Band Navajo
The Alamo Band Chapter of the Navajo Nation is in northwestern Socorro County, New Mexico. The reservation has a land area of 99 square miles and is home to approximately 2,000 members.

4.7 SunZia Southwest Transmission Project

Background
The proposed SunZia project would include two new, single-circuit 500 kV transmission lines within a right-of-way up to 1,000 feet wide. Based on a typical span of 1,400 feet, three to four transmission line structures per mile would be required for each of the two lines, with typical structure heights of 135 feet.

The transmission line route would originate at a new substation (SunZia East) in Lincoln County, New Mexico, and terminate at the Pinal Central Substation in Pinal County, Arizona. Within the JLUS study area, the corridor would travel through Lincoln, Socorro, and Sierra Counties before heading southwest.

The purpose of the proposed project is to transport electricity to western power markets and load centers and to enable the development of renewable energy resources, including wind, solar, and geothermal generation by creating access to the interstate power grid in the Southwest. Under the current timeline, SunZia is anticipated to be operational by 2016.

Environmental Impact Statement and Proposed Resource Management Plan Amendments (FEIS/RMPA)
The BLM is the lead federal agency for the SunZia Final Environmental Impact Statement and Proposed Resource Management Plan Amendments (EIS/RMPA). Cooperating agencies include the National Park Service, New Mexico Spaceport Authority, New Mexico State Land Office, HAFB, Fort Bliss, and WSMR.

The BLM released the Final FEIS/RMPA document on June 14, 2013 and is scheduled to issue a Record of Decision in November 2013 that will include decisions on the approval of SunZia's application for right-of-way on federal lands, and proposed amendments to the RMPA to accommodate the project.

The EIS process analyzed a range of alternative routes, including the BLM preferred alternative and the No Action alternative. The BLM modified the preferred alternative route in response to comments received on the Draft EIS.

For purposes of analysis, the alternative routes were organized into three route groups or segments between the East Substation and Pinal Central Substation. Each of the three route groups consists of individual subroutes. The BLM preferred alternative combines segments of the three subroutes and is about 530 miles long. The preferred alternative parallels approximately 140.7 miles of existing or designated utility corridors. The BLM identified the route as preferred because it would minimize:

- Use of existing utility corridors and infrastructure;
- Impacts to sensitive resources;
- Impacts at river crossings;
- Impacts to residential and commercial uses; and
- Impacts to military operations within the restricted airspace north of WSMR.

Impacts to land uses would occur along portions of the route that cross irrigated agricultural lands, sensitive migratory bird flight paths, residential subdivisions, and areas used for industrial or military testing and training. Particularly relevant for the JLUS context are the potentially adverse impacts of renewable energy infrastructure on aviation, testing, and training activities. The preferred alternative is within a portion of WSMR's Northern call-up area and portions of HAFB's R5107C/R5107H airspace used for flight operations (see **Figure 4.1**).

The DoD remains highly committed to the development of renewable energy sources and the region's three installations are pursuing multiple renewable energy projects in response to federal priorities. As part of its support for renewable energy development, for example, the DoD has designated Fort Bliss, among other installations, as a Net Zero base (**see Section 6** for a description of the DoD's renewable energy initiatives).

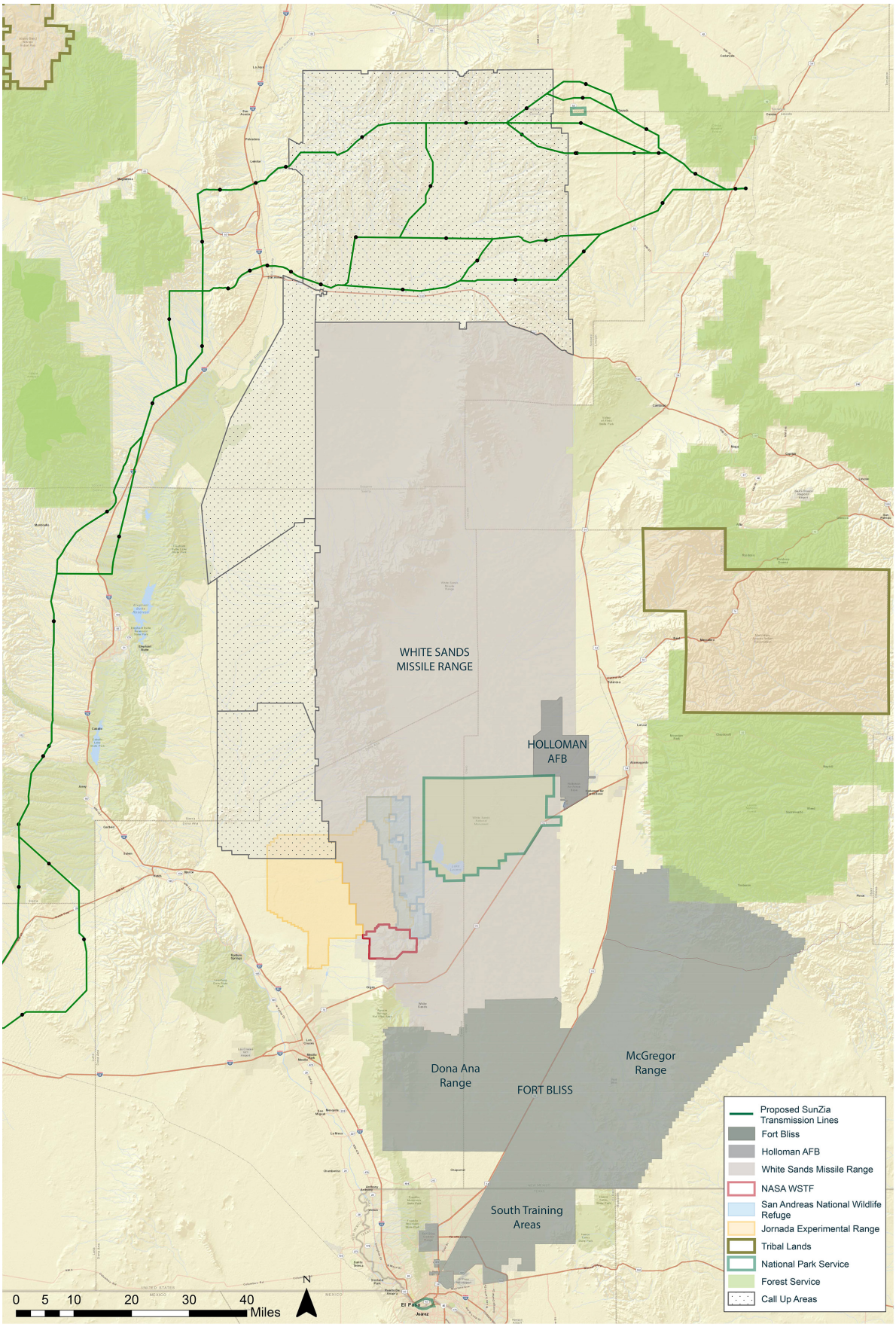
The DoD, however, has expressed ongoing concern about the potentially adverse impacts of the transmission corridor, specifically as it travels through the Northern call-up area nearest to WSMR. The Pentagon has formally protested the preferred route proposed for the project.

Compatibility issues relate to the higher risk of potential damage to the transmission lines should a launched missile malfunction and need to be remotely destroyed within the fallout zone. The fallout zone is an estimated area where debris could land based on factors such as the height and location of the missile at the point of detonation.

The structures also pose a risk to aircraft due to physical intrusion into low-level flight corridors. The growing presence of wind turbines intended to feed the transmission line could also create compatibility issues because of an electromagnetic signature that can compromise radar, electronic systems, and other communications.

The BLM and cooperating agencies, including WSMR continue to work to identify a mutually beneficial solution. The process highlights the importance of jointly establishing planning and siting criteria that can assist in developing compatible renewable energy infrastructure.

FIGURE 4.1 – SUNZIA TRANSMISSION CORRIDOR PROPOSED ROUTES



Apache Point Observatory, New Mexico

4.8 Apache Point Observatory

Located in Sunspot, New Mexico, Apache Point Observatory is operated by New Mexico State University and owned by the Astrophysical Research Consortium, consisting of multiple universities and institutions. With 28 full-time staff members, the observatory's research activities utilize two 2.5 meter telescopes, one 3.5 meter telescope, and the Sloan digital sky map.

Apache Point Observatory is a night-time astronomical facility that relies on dark skies to accomplish its research and operational missions. Among the functions is the Apache Point Observatory Lunar Laser-ranging Operation, or APOLLO. APOLLO shoots a laser at the Moon and the laser pulse is reflected from retroreflectors on the Moon and returned to the telescope. The round-trip time tells the distance to the Moon to great accuracy and is the only means available to test the theory of relativity.

4.9 Texas General Land Office

The Texas General Land Office (GLO) administers and manages state lands and resources in Texas. The GLO manages lands and mineral rights totaling approximately 13 million acres across the state.

The primary mission of the land office is to lease these state lands to raise revenue for the Permanent School Fund, which benefits the Texas public school system. Similar to the NMSLO, adjustments in land tenure status through the GLO can produce either increased or reduced compatibility risks based on the type and intensity of the resulting development.

4.10 Regional and Local Military Advocacy Organizations

The region includes numerous local organizations that act as liaisons between the military and civilian communities and facilitate ongoing dialogue and coordination.

Alliance for Regional Military Support (ARMS) Committee
Established in 2002, the Alliance for Regional Military Support (ARMS) Committee consists of representatives from Fort Bliss, WSMR, HAFB, the City of El Paso, Las Cruces, and the City of Alamogordo. The committee's mission is to enhance and promote regional relationships by creating mutually supporting opportunities and partnerships between the military and civilian communities.

Greater Las Cruces Chamber of Commerce – Military Affairs Committee
The Greater Las Cruces Chamber of Commerce Military Affairs Committee serves as a local advocate for the military and defense industries within the Las Cruces community. The committee works to support local installations, as well as the military personnel and families residing in the region. The Chamber also supports the military through the Military Family Support Committee and the Thank You Team WSMR Committee.

Alamogordo Chamber of Commerce - Committee of 50
The Alamogordo Committee of 50 works to promote and support the existing mission of HAFB and WSMR, as well as the expansion and development of future missions. The Committee of 50 acts as an advocate for the military in the local community and sponsors events intended to build mutual appreciation and support between civilian residents and the military community.

Alamogordo Forum
The Alamogordo Forum is a coalition of business people in the City of Alamogordo who work to support local programs and initiatives intended to improve the quality of life, promote economic viability, and support cultural and educational opportunities in the Alamogordo region. The Alamogordo Forum also works to support adjacent installations by developing community resources to meet the needs of the military community.

Greater El Paso Chamber of Commerce Armed Forces Committee
The purpose of the Greater El Paso Chamber of Commerce Armed Forces Committee is to serve as a liaison between businesses and communities in the El Paso region and the local military installations. The committee seeks to foster partnerships between military and civilian communities to support the military mission, improve quality of life, and build local economic opportunities.

4.11 Other Study Area Entities

The unique qualities of the region, including its relative remoteness, highly varied landscape and rich natural resources support an array of additional research and testing functions. Other entities operating within the study area include:

- White Sands Test Facility (WSTF) – Located on land owned by WSMR, the National Aeronautics and Space Administration (NASA) operates this facility to test rocket propulsion systems and evaluate other space flight components. WSTF services are available to NASA, the DoD, other federal agencies, universities, and commercial industry.

- Jornada Experimental Range (JER) – Located in Dona Ana County, this U.S. Department of Agriculture field research laboratory includes 192,742 acres of land on which they conduct rangeland monitoring and assessment and develop models and tools to manage the regional ecosystem and support improved agriculture and conservation practices.

Co-use of the areas associated with WSTF and JER is governed by a Memorandum of Agreement between WSMR and each managing agency.

Jornada Experimental Range

05 MILITARY INSTALLATIONS

The missions of Fort Bliss, WSMR, and HAFB are distinct and separate, yet they provide an unequalled contiguous footprint of DoD-controlled surface area (composed of over 3.3 million acres), and over 8.8 million acres underlying associated restricted airspace over DoD and non-military land. Each of the installations manages its own land and air assets, but also leverages the synergy of the extended resources for particular missions. The following sections provide a snapshot of the history, as well as the current and foreseeable mission of each installation.

Each section concludes with a summary of compatibility factors identified through a review of previously conducted military studies and assessments. The **Appendix** contains the complete listing of information extracted from Fort Bliss, HAFB, and WSMR documents.

Company G. 22nd U.S. Infantry, Fort Bliss

For most of these factors, existing measures are in place that minimize or reduce effects through formally adopted mitigation, best management practices, memoranda of understanding and agreements, and avoidance procedures.

5.1 Fort Bliss

History

Fort Bliss has a long and storied history that dates back to 1849, when the War Department ordered six companies of the 3rd Infantry Regiment to move from San Antonio to the Great Pass of the North to establish an Army post opposite the Mexican community on the south side of the Rio Grande River.

Fort Bliss served the nation as a military post during the years that followed, moving five times to provide local security to Americans living in the community and traveling the southern route to California. The Army stationed many units here, including the 3rd, 8th, 15th, 23rd, and 24th Infantry Regiments; the 4th, 8th, 15th, and 7th Cavalry Regiments; and the 82nd Mounted Field Artillery Regiment. Units also included Confederate soldiers of the Texas volunteer units, as well as the Union volunteers from California during the Civil War years. Well into the 1900's, the soldiers assigned to these regiments served with distinction patrolling the West Texas-New Mexico region to protect settlers and local communities.

In 1940, the installation saw the arrival of its first Coastal Artillery Soldiers, followed quickly by four other anti-aircraft regiments. With its wide open areas and climate, Fort Bliss became one of seven anti-aircraft training installations. The installation was eventually designated as the United States Army Air Defense Artillery School and Center (USAADASCH) in 1957. In 1945, the testing of the first atomic weapon also occurred north of the post on White Sands Proving Ground, which later became White Sands Missile Range.

From 1946 until 1965 the post expanded to over one million acres to accommodate live missile firing exercises. With the establishment of the Army Air Defense Command, air defense missiles were deployed all over the United States to defend vital installations and industries against a possible air attack. Fort Bliss was the one place in the United States where units could visit to conduct annual live missile firing exercises.

The post's identity as the "Home of Air Defense" remained until 2005 when BRAC re-stationed the USASDASCH to Fort Sill, Oklahoma. With the departure of the Air Defense Artillery School, the primary focus of the installation shifted from training individual soldiers as a Training and Doctrine Command (TRADOC) school to providing combat ready units (supporting contingency operations) as part of a Forces Command (FORSCOM) installation. The emphasis on training shifted from air and missile defense to ground-based heavy armor training (tanks and mechanized infantry).

Current Mission

Fort Bliss, home to the 1st Armored Division (1AD), has the primary mission to train, mobilize, and deploy members of joint and combined combat teams. Fort Bliss is also a "power projection platform" for rapidly deploying troops to worldwide combat zones by rail (to ship) or aircraft. Maintaining troop preparedness through training of soldiers while at home, as well as caring for the well-being of their families, retirees, and civilian employees is a priority for Fort Bliss.

The Army uses a training model that allows troops to train as they fight, with opportunities for multiple diverse brigades training together. This is reflected in the composition of the 1AD with a Stryker vehicle brigade combat team, multiple heavy armored vehicle brigade combat teams, a combat aviation brigade, sustainment brigade, fires brigade, and brigade modernization command (BMC).

The Army also seeks to create realistic training situations and has constructed specific training ranges (including mock villages) and has natural desert and mountainous terrain similar to many combat zones.

The Fort Bliss Training Complex (FBTC) is used not only by the home-stationed units, but also trains non-Fort Bliss troops (over 43,000 in 2012), and supports joint training with other services and allied nations, and limited weapons testing. The BMC is at the forefront of a new fully integrated operational combat system performing both a test and training mission, with activities on Fort Bliss and WSMR.

The installation population has grown from 11,400 military personnel in 2005 to 35,411 in 2013 and almost 45,000 dependants. To support rapid troop increases, a new cantonment area east of the original Main Cantonment has developed. East Bliss has a full array of cantonment functions, including troop housing, 1AD headquarters and administrative functions, and nearby training areas. Growth is projected to continue, with recent decisions that support training for as many as 14 brigade-sized Commands. It is the largest mobilization site in the DoD, and the pre-mission training site for Special Forces going to Afghanistan.

Current units at Fort Bliss include:

- 1 Armored Division HQ
- 1 Stryker Brigade (SBCT)
- 1 Combat Aviation Brigade (CAB)
- 1 Infantry Brigade (IBCT)
- 2 Heavy BCTs 1 Sustainment Brigade
- 1 Fires Brigade
- 1 Military Police BN
- 1 Enhanced Signal BN
- 1 Combat Surgical Hospital
- 32d AAMDC (including 1 Air Defense Artillery Brigade)
- 2 Terminal High Altitude Air Defense Batteries (THAAD)
- 1 Joint Land Attack Cruise Missile Defense Elevated Netted Sensor (JLENS) battery
- Brigade Modernization Command
- 1 Test Brigade
- Joint Task Force North (JTF North)
- United States Sergeants Major Academy
- 1 Military intelligence Battalion
- 2 EOD Companies
- William Beaumont Medical Center
- Two enhanced Mobilization Brigades

Abrams Tank training on Fort Bliss

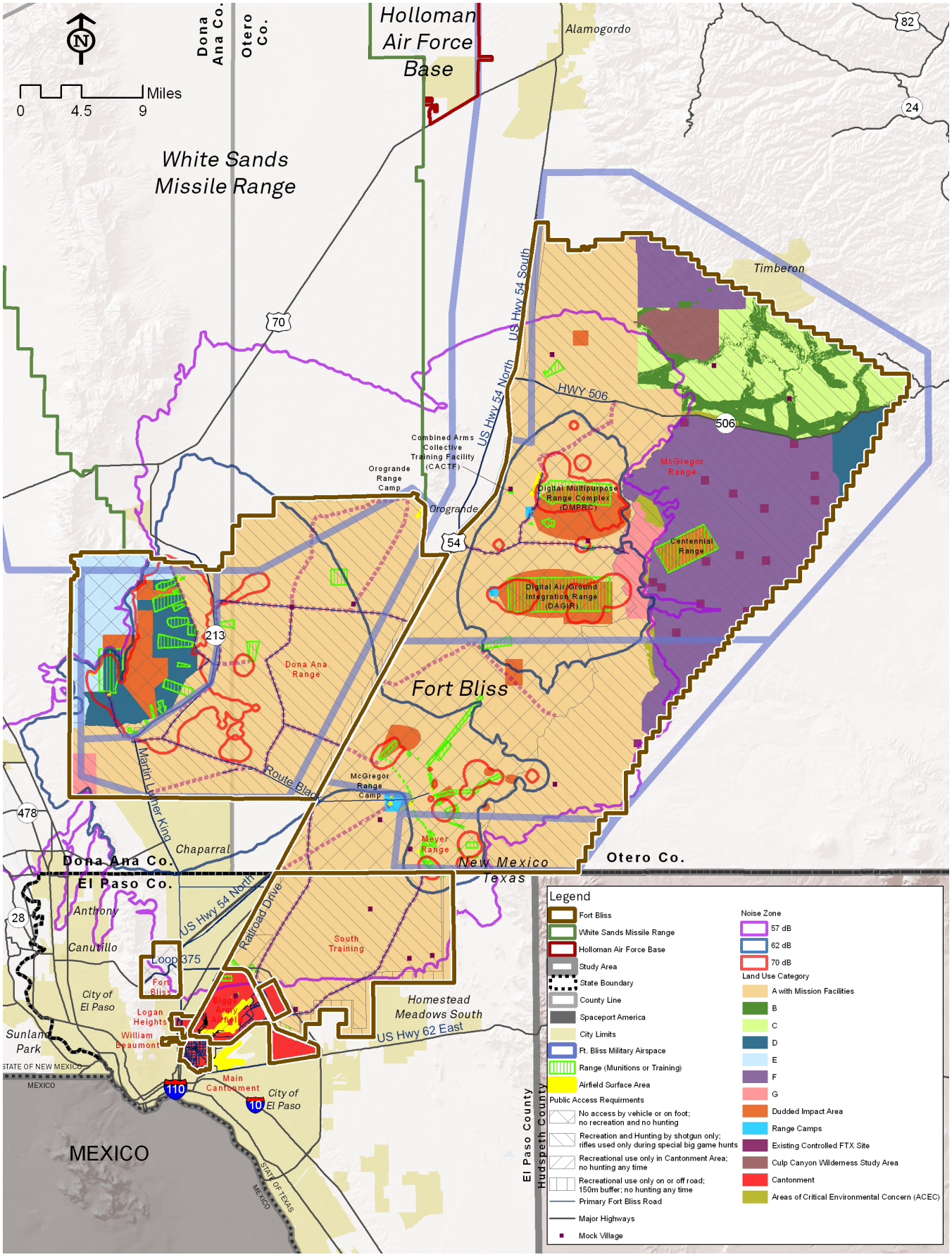
- Air Force Security Squadron
- German ADA Detachment

Biggs Army Airfield (AAF), adjacent to the cantonment areas and El Paso International Airport (EPIA), is the largest airfield in the Army, and site for the marshaling center for an Aerial Port of Embarkation (APOE), with a rail deployment facility, linked to the Sea Port of Embarkation (SPOE) at Beaumont, Texas. The airfield is the home to the 1AD Combat Aviation Brigade (CAB), which operates 114 helicopters, 9 Grey Eagle unmanned aerial vehicle (UAVs), and about 100 small (hand-launched) UAVs.

Beyond the main cantonment areas in El Paso, Texas, the Fort Bliss Training Center (FBTC) has over 1.1 million acres of training lands and associated restricted airspace (see **Figure 5.1**). The FBTC is comprised of three major areas, the South Training Areas (STA) in El Paso County, Texas, and Doña Ana Range and McGregor Range in New Mexico (shown on **Figure 5.1**). The training land is divided into 33 training areas that support a unique mix of heavy and light maneuver, making use of varied environments ranging from flat, arid land to mountainous terrain.

The land use categories shown on **Figure 5.1** reflect combinations of military activities. Specific facilities and ranges provide for weapons qualification training, live-fire, air defense and air-to ground training. Major qualification ranges include the Meyer Range for small arms training, Digital Air-to-Ground Integration Range (DAGIR), Digital Multipurpose Range Complex (DMPRC), Digital Multipurpose Training Complex (DMPTC), Combined Arms Collective Training Facility (CACTF), Centennial Range (for air-to-ground bombing) on McGregor Range, and several firing ranges on Doña Ana Range. In all, the FBTC has over 70 ranges and 17 villages designed to replicate conditions in foreign countries and provide soldiers with realistic training settings.

FIGURE 5.1 – FORT BLISS TRAINING COMPLEX AND SURROUNDING AREAS



A portion of McGregor Range is publicly accessible and supports co-use for cattle ranching, recreation, and other dispersed passive uses (mostly recreational, with some collection of vegetative products). A public roadway, NM Highway 506, traverses the north part of McGregor Range and provides access to ranches and small communities to the east and north. McGregor Range also includes the Culp Canyon Wilderness Study Area (WSA), which supports ground operations for infantry training and Special Forces, with low-flying helicopter activity. The FBTC contains discrete field training (FTX) sites that are used intermittently for more intensive field operations often as part of a joint-force exercise that supports concentrations of people and vehicles for bivouacking (temporary encampments), staging, and troop maneuvers.

Three range camps, McGregor, Orogrande, and Doña Ana, support troops in small built-up areas away from the main cantonment. These camps provide basic accommodation and vehicle and equipment staging and fueling areas. Troops rotate in and out of the camps on a regular basis, traveling by convoys primarily along internal trails and roadways.

The FBTC has associated restricted airspace (R-5103 A/B/C). FBTC controls movement of helicopters and aircraft throughout the complex, and weapons and surface danger zones around several weapons ranges.

In addition, the Army is conducting more non-hazardous aviation activity within the national airspace system (NAS). Mostly this activity involves helicopters and UAV operations. Two areas (one on the east side of the South Training Areas and one to the north of McGregor Range) are experiencing an increase in use for a variety of military aircraft. Fort Bliss has designated an Alert Area for the southern area through the FAA and is pursuing designation for the northern area. This designation does not result in formal charting or rulemaking but provides a means for communicating with non-military pilots about the possibility of additional military air traffic in the areas. The Alert Areas may be used more in the future as operations increase at FBTC.

Recent mission expansions have increased the use of training areas north of NM Highway 506 for wheeled and dismounted troop training. Vehicles are allowed off trails and roads only in specific areas. Also, the new High Altitude Mountain Environment Training (HAMET) mission is bringing more activity (both ground troops and helicopters) to the southern end of the Sacramento Mountains where the terrain and desert environment are similar to several global combat areas. This training will likely increase aviation activity in the Organ Mountains. The interface between HAMET uses and public access for grazing operations and recreation has also been previously noted as a compatibility factor. Other off-post HAMET training operations are currently being analyzed in an Environmental Assessment.

	Military Uses/Activities											
FBTC Land Use Category	Off-Road Maneuver: Heavy	Off-Road Maneuver: Light	On-Road Vehicle: Maneuver	Dismounted Maneuver	Aircraft Operations	Controlled FTX	Mission Support Facilities	Live-Fire	SDZ/Safety Footprint	Surface Impact	Range Camps	Environmental Management
A	•	•	•	•	•	•	•	•	•			•
B		•	•	•	•	•	•	•	•			•
C			•	•	•	•	•	•	•			•
D			•	•	•		•	•	•			•
E			•	•	•			•	•			•
F			•	•	•	•			•			•
G			•	•	•				•			•
WSA/ACEC				•	•				•			•
Impact Areas					•			•	•	•		
Range Camp					•		•		•		•	•

Table 5.1 | Fort Bliss Land Use Categories Matrix

ACEC Area of Critical Environmental Concern
FTX Field Training Exercise site
SDZ Surface Danger Zone
WSA Wilderness Study Area

Foreseeable Mission
Fort Bliss will continue its current mission in the future and anticipates the following operations:

- The training tempo for the current training mission will increase as troops return from combat zones and do not quickly redeploy. This situation is referred to as a "full nest." Even with force drawdown, this will not translate into less training. On the Army Force Generation (ARFORGEN) model of train/deploy/reset, overlap of units cycling in and out of combat areas will result in a higher portion of troops back in the U.S. Moving to a 2-year redeployment cycle could also increase the overlap of units. In peace time, the need for training will increase with more troops home. Most ground troop training activities would not extend outside the current Fort Bliss and contiguous WSMR boundaries. But in the future, Fort Bliss will use all capabilities up to authorized levels. The "full nest" may also expand the military population and their dependents in the El Paso region.

- This increased tempo may heighten the mix of military and non-military users in the northern part of McGregor Range. For example, the HAMET mission may intensify with more units coming from other locations to train in realistic conditions. The interface between these uses and public access for grazing operations and recreation may also increase, with the associated challenges of public safety, damage to fencing, and less time for grazing management.

- Also, the Keyhole area (BLM land between WSMR boundary and U.S. 54) provides a logical and easy connection between WSMR and FBTC, and more use of this area could provide additional flexibility for ground training, BMC test-to-train operations, and activities by Special Forces. No military use is likely in the near-term and any potential military activity in the area would require NEPA analysis with public participation and the concurrence of BLM.

- The trend for more use of unmanned aircraft systems (UAS) will continue, using both restricted airspace and the NAS with appropriate approvals from the FAA. The use of the term UAS reflects the fact that these complex systems include ground stations and built-in control and/or guidance systems as opposed to remotely controlled air vehicles, which the Air Force refers to as Remotely Piloted Aircraft (RPA).

- The FAA, who controls the airspace around El Paso International Airport (EPIA) and Biggs AAF, will not allow military UAVs to operate at Biggs AAF because of proximity to commercial arrival and departure tracks. Instead, a concept for a new UAS airfield in southern Doña Ana Range (known as the Grey Eagle project) within restricted airspace R-5107 A/K is under consideration. Depending on its configuration, this airfield could also support Air Force RPA, and armed drones that would operate in the restricted airspace up to 35, 000 feet above ground level (AGL).

- Fort Bliss may support visiting units returning to FBTC to perform specific skills for the air defense mission because of its unique capabilities to support longer-range weaponry. This would result in more missile firings in addition to the ground maneuver mission, using the full extent of Fort Bliss land and airspace, and could also extend into WSMR and R-5017.

- Fort Bliss leadership wants Fort Bliss to be a regional training center in addition to Fort Bliss stationed units. This is already happening, but could increase if, for example, a CONUS Replacement Center (CRC) is brought to Fort Bliss. This mission, which trains/retools and deploys individual replacement soldiers, rather than entire units, would further increase student throughput and add to the transient population on post.

- In the future with more troops at home, it is likely that more soldiers will use the Orogrande, McGregor, and Doña Ana Range camps (particularly visiting units) to move troops away from the increasingly congested East Bliss cantonment. One future concept would develop helicopter refueling at Orogrande given its position to support training on WSMR and Fort Bliss. The need for air linkage for UAVs between McGregor Range, Orogrande Range camp, and Doña Ana Range will grow as a result.

- Biggs AAF will see some increase in operations when the Air Force F-16s use this location as an auxiliary airfield for pattern work (projected for 2014). This is not expected to expand noise exposure zones appreciably, but will add to the overall mix of aircraft in the environs of El Paso International Airport.

- A new outdoor machine gun firing range is approved for a location on Loop 375 by the existing Rod and Gun Club. Development of this range has currently been placed on hold.

- The U.S. Air Force has announced plans to move its newly configured Security Forces Regional Training Center to Fort Bliss. The consolidated training center would bring between 8,000 and 10,000 airmen to the post each year for security forces training beginning in 2014.

- As always, military missions and the number of personnel assigned to installations are subject to great fluidity. The Army has recently announced plans to shrink its active component end strength by eliminating brigade combat teams. The planned force restructuring could affect Fort Bliss and WSMR. The net loss for Fort Bliss is anticipated to be approximately 750 people. The economic impact assessment element of the JLUS has been delayed until November of 2013 to enable analysis of the most current and accurate personnel figures at the three installations.

Compatibility Factors

The following list identifies the major compatibility factors that affect surrounding communities, or inversely, the Fort Bliss mission based on a review of 12 documents (see the **Appendix** for a listing of the documents and more detailed summary of information obtained).

The primary compatibility concerns from the Fort Bliss mission revolve around noise from weapons firing in specific locations on the installation training areas, increased demands on community services and infrastructure (especially water and transportation) from the influx of population, and indirect impacts on regional water supply and water quality from extensive development and water consumption.

- Fugitive dust generation from demolition/construction activities, military convoys on roads and trails, soldier training, and off-road vehicle operations can affect air quality and visibility. Air pollutant emissions also result from use of construction equipment, an increase in privately owned vehicles, aircraft operations, and use of obscurants with possible effects on public health. Regionally, El Paso's air is also affected by less regulated uses in Ciudad de Juarez, making it more difficult to manage air quality.

- Preliminary investigations have shown low levels of alpha and beta radiation in a bunker northwest of Biggs AAF. The area, which had limited access, is now sealed off. At this time, no risk to the general public has been identified. Fort Bliss is working with experts from the Army Environmental Command, the Public Health Command, other Army agencies and the Air Force to conduct a thorough investigation.

- Wildfires caused by use of obscurant munitions, live fire training, off-road vehicle maneuvers, and use of pyrotechnics have a range of regional effects on air quality, wildlife, soil erosion, cultural resources, visibility, vegetation, and water quality.

- There has been extensive physical development of new Fort Bliss cantonment areas and training facilities over the last six years. Growth at Fort Bliss contributes to the widespread impacts typical of rapidly expanding communities and evident in the El Paso area. This includes effects to the capacity of regional infrastructure (for example, landfill capacity, water supply, power supply and distribution, stormwater system capacity, housing supply, community services, health services, schooling, law enforcement). Urbanization is altering the visual context of El Paso. Widespread development requires ongoing efforts to strengthen and better define communication between Fort Bliss and city/county planners and environmental staff.

- Construction on Fort Bliss is governed by permits and use of best management practices to minimize potential environmental concerns (such as soil erosion, noxious weed introduction, stormwater runoff).

- Increased growth and vehicular activity is causing congestion and declining level of service on major interstates (both I-10 and I-25) and arterials in El Paso (U.S. 54, Montana Avenue, roads around the airport and Fort Bliss). Major highway projects and redevelopment causes temporary interruptions to normal commuting patterns. Traffic congestion can lead to deteriorated air quality with an impact on quality of life due to longer wait times, as well as reduced or disrupted access to services. Conversely, development has brought investment and revenues to the city and county, which will overtime, result in expansion of services and infrastructure. El Paso continues to face growth challenges, but they are ultimately viewed as opportunities.

- Local highways are also supporting additional mission-related traffic, such as convoys from cantonment areas up into the training areas (Doña Ana Range and McGregor Range). The mix of vehicle types and speeds is one issue that affects the safety and commute times of other drivers, as is wear and tear (and maintenance responsibilities) on roadway surfaces used by military convoys. To mitigate such issues, Fort Bliss constructed a tactical overpass to avoid heavy tracked vehicle convoys across U.S. 54. It is anticipated that a second tactical overpass may also be constructed sometime in the future.

- Increased use of uncontrolled airspace (Class E and G) in the El Paso area for military purposes and aircraft may constrain other general and commercial aviation users. Fort Bliss has proposed and defined new Alert Areas that provide a degree of warning to non-military pilots about higher levels of activity. This could represent a trend and an alternative to reclassifying airspace into more restrictive use with less access for civilian air traffic.

- Localized areas around Fort Bliss are affected by noise and vibration from training operations (e.g. live fire training, firing of large caliber weapons and missiles, off-road vehicle maneuvers, aircraft noise), as well as demolition and construction activities. Fort Bliss is working on several proposals to address noise issues through the ACUB program and related initiatives. These proactive projects usually involve purchase of adjacent undeveloped land or future development rights by a non-profit partner working on behalf of the Army to establish land uses compatible with these noise levels.

- Radio frequency management is becoming increasingly complex with potential interference for all users. The mixture of military, commercial, and private users in a congested area (with intense military training and testing, civilian air traffic, commercial and individual communications) is further complicated by the proximity to Ciudad Juarez, Mexico, which has different regulations governing spectrum use.

- More intensive military operations can contribute to a perceived decrease in solitude and thus lessen the attractiveness of outdoor recreation resources in the region. On Fort Bliss, increased off-road vehicle maneuvers, additional firing ranges, and more helicopter and UAV operations can introduce auditory intrusions. Supersonic aircraft operations and low-level operations by units operating from HAFB can also expose recreational or cultural sites on or around the FBTC to noise.

- Water supply is a regional concern. Increased water demand for Fort Bliss personnel and support functions, coupled with regional population growth on both sides of the international border, could cause aquifer drawdown/depletion of fresh water from the Hueco Bolson aquifer. Fort Bliss has addressed its future water needs through several innovative projects, including coordination with the City of El Paso on the construction and operation of the Kay Bailey Hutchison Desalination Plant. However, drought contributes to wider regional ground and surface water depletion. Providing a long-term sustainable water supply will likely be an ongoing issue to address at the local level and beyond. While treatment of brackish water is an alternative supply strategy, desalination processes can pose some human health risks from possible release of hazardous waste at the desalination plant and during transport. Operations pose a minor risk of contaminating surficial aquifers and underground sources of drinking water from disposal of desalination concentrate. There may also be a slightly increased risk of localized low-intensity earthquakes from desalination deep-well injection sites.

5.2 White Sands Missile Range

History

In the fall of 1944, as a result of America's accelerated missile program, it became evident that a land range somewhere in the United States would be required to test and recover missiles after flight for further study. These studies would provide data to develop missiles for future military application. A group of specially-selected officers and civilians representing the War Department of the Corps of Engineers visited all potential range sites and eventually chose the Tularosa Basin in southern New Mexico to create the White Sands Proving Ground (WSPG).

The majority of selected land for WSPG was already under the control of the War Department, including the Fort Bliss Anti-aircraft Firing Range, Doña Ana Target Range, Castner Target Range, and Alamogordo Army Air Field's Alamogordo Bombing Range. In addition to acreage controlled by the Army, other public domain and private lands were added in the following years to comprise the new proving ground. Work at the site began in July 1945 as buildings and roads were constructed from plans prepared two months earlier. Since the prevailing attitude was that White Sands would only be a short-term project, temporary buildings, such as old Civilian Conservation Corps structures and a hangar were moved from Sandia Base in Albuquerque, NM.

In the early years, Fort Bliss was responsible for most of the administrative and supply services at WSPG. The impact area north of the main post (the Alamogordo Bombing Range) was still under the jurisdiction of the Army Air Corps. The Army's first launch area, now referred to as Launch Complex 33 was established east of the headquarters area. 1945 saw significant construction activity; the launch of a modified Tiny Tim booster rocket and a dummy Women's Army Corps (WAC) Corporal rocket; and an influx of assigned troops. Testing continued as contracts were let for more permanent structures at both the firing facilities and in the main post.

In 1946, White Sands began its famous modified V-2 launches, continuing operations through 1952. Meanwhile, the Navy signed on at White Sands with the construction of a Naval cantonment area and launch facilities just west of the Army headquarters. The V-2s launched from White Sands with their scientific payloads set a variety of milestones for America's space program, including high-altitude and velocity records for a single stage rocket and in-flight rocket control. During the U.S. program, about 70 V-2s were fired at White Sands.

Current Mission

WSMR is a tri–service, Major Range and Test Facility Base (MRTFB) managed by the U.S. Army's Installation Management Command and reports directly to the Army Test and Evaluation Command. WSMR supports developmental and operational testing for the Army, Air Force, Navy, allied foreign governments, universities, commercial, and private entities.

As the largest test range in the U.S., WSMR provides unique infrastructure and test facilities, including a nuclear survivability test reactor, radar test facilities, a high energy laser systems test facility, and a state-of-the-art range control center. WSMR's mission is to provide testing and development of weapons and equipment (both hardware and software) for military use in combat zones and for homeland security. WSMR has historically supported test programs requiring large land areas with controlled access and restricted airspace due to hazards associated with the test objects. To safeguard and improve WSMR's unique assets, Army regulations support facility and technology investments in the following key areas:

- Aircraft systems-aircraft armaments fixed wing;
- Command, control, communications, computers, intelligence, surveillance and reconnaissance;
- Directed energy weapons (high-powered microwave [HPM], lasers);
- Air/missile defense systems (surface and air-launched platforms);
- Missiles/rockets (non-aviation, non-line-of-site);
- System of Systems Engineering and & Integration Directorate (Future Combat Systems, Brigade Combat team level);
- Electromagnetic environmental effects, electromagnetic interference and compatibility, electromagnetic pulse; and
- Nuclear weapons effects.

WSMR tenant organizations include:

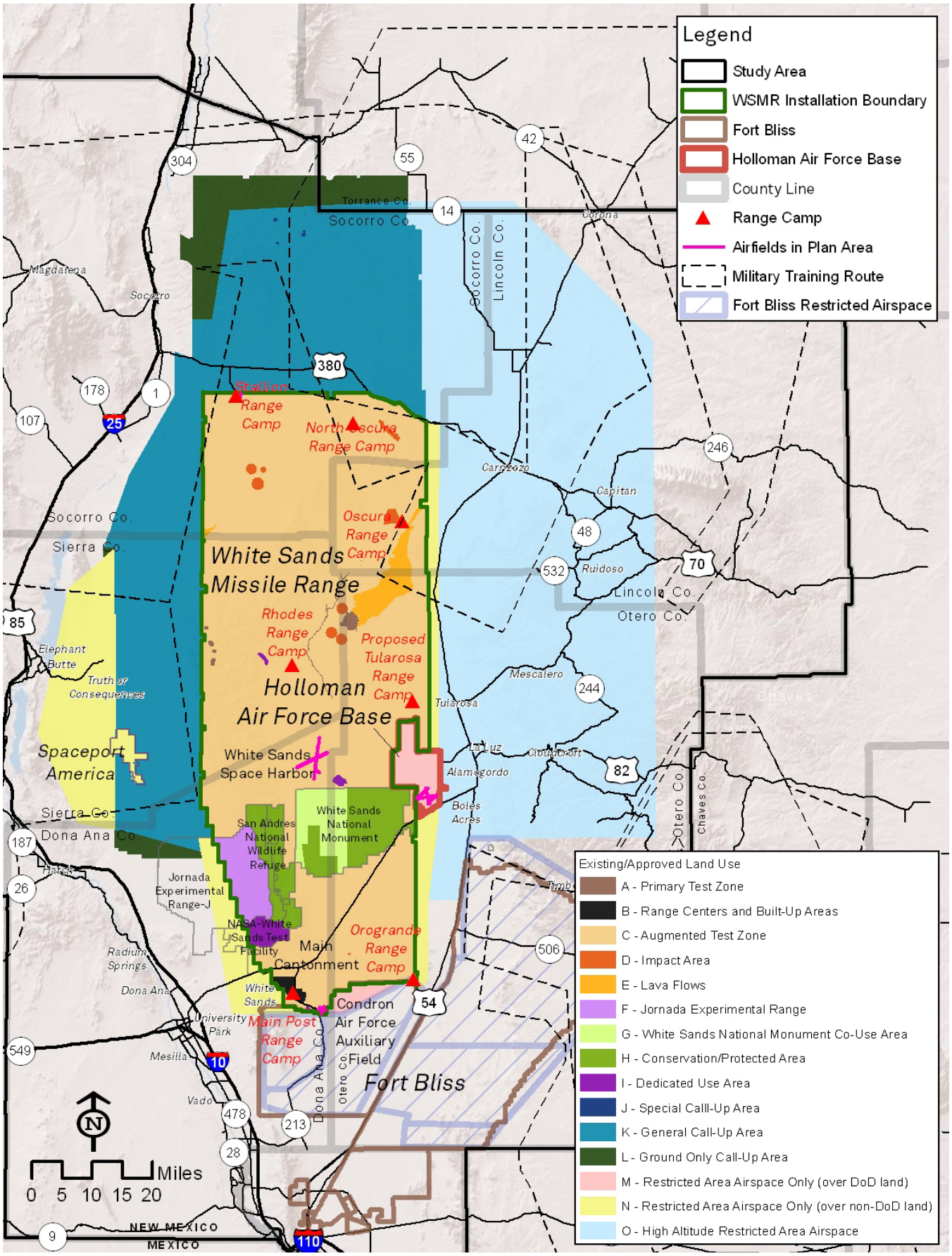
- System of System Integration (SOSI) Directorate
- National Aeronautics and Space Administration (NASA/ White Sands Test Facility
- National Reconnaissance Office (NRO)
- U.S. Army Training and Doctrine Command (TRADOC) Analysis Center
- Defense Threat Reduction Agency (DTRA)
- Army Research Laboratory (ARL)
- Center for Countermeasures (CCM)
- National Geospatial Intelligence Agency (NGA)
- NASA Tracking and Data Relay Satellite System (NASA/ TDRSS)
- 2nd Engineer Battalion

WSMR, consisting of almost 2.2 million acres of land (including WHSA, San Andres National Wildlife Refuge, and Department of Agriculture JER) has associated restricted airspace overlying over 5 million acres. With the adjacent land and airspace of HAFB and Fort Bliss, an unprecedented area is available for military test and training operations. WSMR can further expand its surface area to include land within the Northern Fix and Western call-up areas for use as surface danger zones. This is accomplished through over 90 contracts with individual land owners who contract with WSMR to allow a certain number of evacuations with accompanying per diem.

In addition to its test mission, WSMR has taken on a new role in Army Transformation; it will now house and host limited training activities and field exercises for uniformed personnel. The 2nd Engineering Battalion moved to WSMR between 2009 and 2011, and performs ground-based training, mostly in and around the main cantonment area. Given the impact of ongoing budget reductions, WSMR will lose the 2nd Engineer Battalion by 2017. While the WSMR Range-Wide Missions Capabilities EIS approved limited areas for off-road heavy vehicle maneuver training, to date a brigade-sized combat unit has not been deployed to WSMR. The unit consists of about 600 soldiers plus their family members. The Army and Air National Guard use facilities on WSMR, and the Air Force relies heavily on WSMR airspace and two bombing ranges for training.

The Land Use and Airspace Strategy Plan (LUASP) was prepared by the White Sands Test Center (WSTC) at WSMR to support current and future planning at the installation in order to meet evolving mission requirements and facilitate user access to range resources. The LUASP is a capability-based land and airspace framework for defining the principal elements of the installation, associated mission activities, and a vision for future use and development to support current and future users and missions. Derived from the LUASP, **Figure 5.2** shows the overall functional areas and uses that pose compatibility concerns surrounding WSMR.

FIGURE 5.2 — WHITE SANDS MISSILE RANGE OPERATIONAL USES AND SURROUNDING AREA



The main cantonment is a small area in the south end of WSMR. It is accessed from U.S. 70, from War Highway from El Paso, and U.S. 54 on the east leading to Nike Road. Within the boundary of WSMR, several sites and facilities support major tenant programs. Some research and testing is confined completely within a structure or designated area (e.g. Army Research Laboratory meteorological tests and data collection and the environmental test chambers). Some tests are static and some involve moving components (both targets and test objects). Tests are designed so that hazards (e.g. debris, explosions, laser emissions, other equipment or instrumentation with harmful emanating frequencies) are contained within a defined area or volume. Areas exposed to hazards are cleared of non-participating persons. At the largest scale, this volume may encompass and require the evacuation of the surface area of the WSMR-controlled land, WSMR restricted airspace, and occasional-use call-up areas.

The main cantonment area contains facilities used for specific controlled test programs and research, such as the Army Research Laboratory and meteorological services, Electromagnetic Radiation Effects (EMRE) facility, Environmental Labs and Chambers, and Nuclear Effects complex. To the east of the main cantonment area is Nike Road, which has several missile launch sites.

The main range has an infrastructure network for monitoring, tracking, communicating, and relaying data in support of test programs. This includes five range centers with varied capabilities that are located strategically across the range where range users can mobilize personnel, equipment, and support operations.

The U.S. Navy, Air Force, and Army all run key test programs at WSMR. Many of these tenants operate from their own facilities on WSMR; some functioning completely within enclosed environments, and some utilizing restricted airspace and land for hazardous operations, instrumentation, and tracking assets. The Navy's missile test programs use the full length and width of the range including the call-up areas to provide realistic distances found in combat zones. The capability to test weapons at their operational range is a critical asset provided by WSMR; there is no other range in the United States that can simulate similar test capabilities.

Historically, WSMR's primary mission supported missile programs. Ground-based launch sites are concentrated in the south end of WSMR with others at mid-range and the north end of WSMR. These locations give flexibility to conduct anything from short, medium, to long-range launches of both test missiles and targets. Extended range is provided by occasional use of the Northern Fix, and a missile flight corridor from Fort Wingate in western New Mexico. This latter asset functions more as an airspace advisory to FAA with extremely low risk from a potential aborted mission and debris fallout.

WSMR also provides services and facilities that are available to multiple users on a fee basis, including coordinated range control and a spectrum of test support capabilities for all aspects of test planning, support logistics, and data capture and analysis. Specific sites within WSMR supporting single-user activities include the underground tunnel system used by the Defense Threat Reduction Agency (DTRA) and the Ground-based Electro-Optical Deep Space Surveillance (GEODSS) system, which tracks small objects in deep space.

The National Aeronautics and Space Administration (NASA) conducts life cycle testing to develop and produce propulsion systems for several space programs and vehicles. These are predominantly performed within special facilities and test chambers. WSTF conducts simulated mission duty cycle testing to develop numerous full-scale propulsion systems. This location is also one of NASA's Tracking and Data Relay Satellite System (TRDSS) sites. Operations and use of White Sands Space Harbor (WSSH), located in the mid-range area of WSMR, are governed by the DoD.

The SOSI Directorate is leading the joint Network Integration Evaluation (NIE) program, which undertakes semi-annual soldier-led evaluations of evolving warfighter systems and operational performance in the test environment. These tests function like large exercises, and use as many as 3,800 soldiers of a brigade combat team from 1AD Fort Bliss. The test is managed by the Army Test and Evaluation Center (ATEC), Brigade Modernization Command (BMC) and the SOSI Directorate. It involves air and ground operations, with nodes of activity using the length of WSMR's land and airspace. The tests involve surface maneuvering, target acquisition, and communication command and control functions to develop all the components of a fully integrated fighting capability. This program is growing at WSMR.

The Air Force manages and uses two bombing ranges, Red Rio and Oscura, on WSMR. The F-22 mission has relied more on the use of restricted airspace for supersonic operations, and air-to-air mission rather than air-to-ground, so that the use of the bombing ranges has diminished in recent years. Due to terrain and distance, noise from these ranges has not been an issue for surrounding locations outside the WSMR boundary. However, several facilities on the periphery of WSMR have potential for spill-over effects if missions or test parameters change in the future.

For example, the Army National Guard has developed firing ranges on the north end of WSMR, and the Center for Countermeasures uses a facility along the southeast boundary. While containing and managing effects within the boundary is required, military needs are ever-changing. The concept of intermittent or occasional expanded activity zones could accommodate existing and future capabilities without requiring the dedication of additional land or airspace.

The High Energy Laser Systems Test Facility (HELSTF), run by the Survivability, Vulnerability, and Assessment Directorate (SVAD), operates the nation´s most powerful laser in support of DoD laser research, development, testing, and evaluation. HELSTF is the only site capable of supporting a broad spectrum of directed energy technologies for other government agencies, industry, and academia. Specialized infrastructure and isolated location provide unique capabilities for testing new laser technologies, such as free electron or advanced solid state lasers.

Foreseeable Mission

WSMR will continue its current mission, while recognizing that the future will bring changes that respond to research and development needs that are as yet unknown. In general, the following trends will drive the future mission at WSMR.

- WSMR "grew up" as a developmental test range, but will expand its use to include operational testing, training, live-fire, and limited maneuver.

- WSMR's Strategic Plan specifically identifies the following activity areas as foreseeable: 1) Increased UAV activity by HAFB; 2) Transition of F-22 to F-16 training by HAFB, increasing the use of bombing ranges on WSMR; 3) Testing/training by the Army's NIE with test requirements growing beyond traditional network testing to include more diverse simultaneous operations using air, ground and radio frequency band width; 4) Expansion of electromagnetic testing capabilities to include a Joint Urban Test Capability with mock urban construction and spectrum "noise" and modernizing and enhancing existing test facilities and spectrum analysis capabilities; 5) Weapons System Evaluation Program (WSEP), which will dramatically increase the use of the range for live fire purposes.

- WSMR foresees developing a dynamic airspace management capability combining Fort Bliss, HAFB, and WSMR management in a centralized system. This will allow for more real-time command and control and thus more agility and flexibility in scheduling for military users and communicating directly with non-military pilots to assist in their transit through restricted and other military use airspace.

- The Range-Wide Mission and Major Capabilities EIS approved the capability to support training of heavy armored vehicle units. Although the Army has not stationed a conventional brigade combat team at WSMR to date, this mission would involve use of more land for off-road maneuver, likely south of U.S. 70.

- Several tenant organizations have increased their testing of systems across greater distances, within high clutter and controlled clutter frequency environments. These tests, involving both traditional missile air-to-ground and air-to-air tests, could use airborne launch platforms and sophisticated tracking and jamming equipment. Tests are often designed to push the limits of a system's performance. For example, a test that pushes the limit on range will end up providing more land for the operation in the real world; similar for detection with airspace and precision with frequency. Test activities will link multiple, disparate sensors in all environments and communicate across distances and different platforms so that shooters on the ground, sea, or air can engage multiple targets over great distances. Future missions would use UAV targets, with intercepts in the call-up areas. The trend for Navy missions is for long-distance testing from Green River or Fort Wingate, near Gallup, NM, involving the launching of targets (AQMs) from aircraft at about 50,000 feet AGL and at speeds of Mach 1 or greater in FAA-controlled airspace using an established launch pattern. These events usually use a window of about an hour and a half and would activate a road block of U.S. 380. This will drive the need for using existing assets such as the full extent of restricted airspace and land including the Northern Fix and Western call-up areas, and additional occasional-use missile corridors, similar to the existing one between Fort Wingate and WSMR. These provide specific contextual capabilities that support WSMR's core mission and capabilities. While there is not a specific proposal at this time, siting new temporary-use corridors and extensions would require careful analysis of the specific hazard and risk factors and underlying land uses and infrastructure.

- From a compatibility perspective, WSMR will continue to rely on the extensive land and airspace assets it has in place for long-distance testing, including those used by agreements with other agencies and private land owners. Changes in development surrounding WSMR may impede the use of extended areas of operation, and future needs will be even more sensitive to any limitation in use. Future test programs will also put more reliance on using and maintaining spectrum clarity.

- WSMR is conducting a study to examine a regional approach to military airspace management and look at ways to increase efficiency. Under one concept, the military would provide real time airspace control by a certified Air Traffic Control (ATC) facility rather than the current Military Radar Unit (MRU). This could give more transit/access to civilian aircraft through special use airspace. Current procedures only allow civilian traffic to transit restricted airspace when it is not active, or under control of the Albuquerque Air Route Traffic Control Center (ARTCC). That means the WSMR MRU must release control back to Albuquerque International Sunport (ABQ) ARTCC, and due to lead times involved, it is impractical for ABQ to accept the airspace unless they can have it for at least two hours. The study is looking at opportunities that would allow a military ATC facility to permit short notice transit through restricted airspace, but few of those opportunities are of sufficient duration to release the airspace to ABQ.

- Use of UAVs/RPAs between military installations in the region including Cannon and HAFB will increase and may use new corridors for transit. Currently, UAVs/RPAs must meet the see-and-avoid standard in national airspace. The FAA is going toward a sense-and-avoid standard as these capabilities are incorporated into the UAVs.

- A notional concept could expand special use airspace on the west side of WSMR in the event that the F-16 mission needs more airspace given other users of WSMR airspace.

- WSMR anticipates an increase in laser program operations. It is difficult to predict the extent of safety envelopes for new systems and delivery modes, particularly air-to-air testing. All tests are planned and designed to remain within existing controlled airspace and land areas. In the future, this type of testing may make more frequent use of the Western call-up and Northern Fix to provide a larger operational envelope, especially for airborne platforms.

- WSMR anticipates investing in diagnostic instrumentation, emitters, facilities, live and constructive tactical networks, and modeling and simulation, all of which are reliant on spectrum fidelity and access. Imminent needs include investment in Joint Urban Test Capability, restoring and modernizing the Electromagnetic Radiation Effects Facility (EMRE) site, and enhancing spectrum analysis and characterization capability. WSMR will evaluate and upgrade its own tactical networks to provide better interface with unmanned systems and for electromagnetic testing. Tenants may expand and upgrade their specialized facilities on WSMR to meet future needs, such as the Air Force RAMS and NRTF facilities.

Compatibility Factors

The following list identifies the major compatibility factors that affect surrounding communities, or inversely, the WSMR mission based on a review of 15 documents (see the **Appendix** for a listing of the documents and more detailed summary of information obtained).

The primary compatibility issues between WSMR and surrounding areas include radio frequency and spectrum issues (community and military use can affect one another); changes in land use and development or new infrastructure in call-up areas or near sensitive military instrumentation sites; the noise and safety issues affecting surrounding development and wildlife; and the ability of regional airspace to accommodate the needs of both civilian and military users. WSMR has a high interplay of effects between their testing mission and regional stakeholder concerns that requires a careful balance of long-term interests.

- Test and training activities may affect air quality through emission from the use of vehicles, equipment, or test items (either on the ground or in the air), particularly from special propellants or fuels. Other examples of non-standard airborne products of concern include chemical, biological, and radiological simulant plumes and taggants (materials used to track the path of simulant plumes through the air).

- The effects of dust and airborne particulate matter on air quality are regional issues, particularly for Doña Ana County. Dust generated during any major construction, and by the use of heavier, tracked vehicles during tests or training may cause an increase in dust generation during cross-country maneuvers. In high winds, drifting dust could diminish visibility along U.S. 70, potentially causing safety hazards to motorists. Similarly, increases in use of countermeasures during tests could produce smoke or dust that may obscure visibility or negatively impact viewscapes.

- The safety envelopes for missions involving missile firings, laser/directed energy use, and other hazardous operations can extend beyond the land boundary of WSMR with potential secondary effects such as debris fall-out and the potential for fire or environmental contamination from hazardous operations. WSMR relies on current agreements and contracts to support these activities in extension areas (both restricted airspace and surface call-up areas). External factors, including economic and population change, can alter the availability of use in these extension areas and in turn the flexibility of WSMR's operations.

- Restricted airspace R-5107 (composed of several subunits) is a large continuous block of airspace (from surface to infinity) controlled and used by WSMR. Two corridors through R-5107 (R-5107/F/G) allow for transit by commercial airlines, mostly at night and on weekends, but only when WSMR issues a notice to allow for non-military access. At other times, all non-participating aircraft must fly around this block, adding time and cost to commercial and private aviation uses. Increased use of R-5107 for test, training and Spaceport purposes may limit time available for civilian air traffic, even on weekends.

- U.S. 70 and U.S. 380 are closed during some test missions. Closures are generally short in duration (about an hour) and generally occur early in the morning when atmospheric conditions are most stable. These closures are permitted under long-standing agreements with the New Mexico Department of Transportation. Local residents and commuters are familiar with this situation and are informed through radio announcements and social media; they can also check the closure schedule through a dedicated telephone number to minimize the inconvenience of waiting at roadblocks. An increase in frequency of road closures in the future could become more burdensome for area residents, businesses, and visitors.

- Wildlife on WSMR has the advantage of pristine and extensive areas that have resulted in the recovery of threatened species. However, the wildlife is also subject to some localized impacts from changes in activities and levels of use for infrastructure development, various ground operations, and training activities, including hazardous operations and missile testing. These impacts can include:

    - Loss/degradation/fragmentation of habitat;
    - The introduction/spread of invasive species;
    - Avoidance behaviors and displacement of wildlife;
    - Decreased species diversity;
    - Direct mortality of animals through collisions with vehicles and equipment;
    - Debris contamination; and
    - And general impacts to protected species, such as startle behavior, interruptions to nesting and breeding, and interruptions to migration/wildlife corridors.

- WSMR manages its natural environment and coordinates with the United States Fish and Wildlife Service (USFWS) on species of concern. Changes in ecosystems and habitat brought about by drought, fire, and mission activities, and potential changes in the status of sensitive species could bring new constraints on WSMR in performing its mission in the future.

- Noise from some test operations and Air Force training in WSMR's restricted airspace affect the surrounding region. For example, Frequent High Explosive (HE) testing can cause possible impact on and off the range from blast pressures during adverse weather conditions such as strong inversions. Similarly, atmospheric conditions can amplify sonic booms from aircraft operations. There is the potential for vibration-induced effects on historic properties and sensitive fossil beds from low altitude flights in the training area in addition to residents in nearby communities and east of Las Cruces.

- Inversely, selected locations on WSMR are sensitive to noise and vibration (such as the Air Force's Acoustic Research Center) and need noise and vibration-free environments. Any off installation development, blasting, infrastructure, or construction can negatively affect these sensitive military resources.

- Changes in activities, personnel numbers, and levels of use on WSMR lands may generate new demands for energy and potable water (including groundwater), using sources that supply the surrounding communities. Similarly, regional growth could further strain local services, and put demand on public utilities and water supplies.

- Multiple uses of the frequency spectrum are having effects both on numerous WSMR missions and also on commercial and private users. There is potential for conflicts with residential, commercial, or municipal electronic systems and communication systems, including air traffic control systems. The JLENS facility could create significant impacts in terms of frequency "jamming" during operation both within and outside the installation. Facilities such as air traffic control (ATC) and the National Radio Astronomy Observatory (NRAO) also use radar during their operations, using frequencies assigned to more than one use or user.

- Light emitted from existing and new facilities has localized impacts on the dark night skies in the region, increasing the perception of light pollution. There are also facilities on WSMR, such as the Ground-Based Electro-Optical Deep Space Surveillance (GEODSS) site, that are sensitive to light from surrounding development, as are observatories in the region.

- Public access to WSMR is extremely constrained for safety and security reasons. Some permitted hunts occur on the range, and annual events provide escorted tours to the Trinity site. Increased scheduling for test and training could reduce the availability of WSMR land and call-up areas for these limited recreational purposes.

- If the population on WSMR were to grow substantially, this could increase noise around the Main Post and local highways from greater commuter traffic on U.S. 70 and Highway 213.

- The national security mission is outgrowing WSMR land mass capabilities and requires expanded distances in the air, ground, and electromagnetic domains. These needs highlight the reliance of WSMR on coordinated planning efforts with regional stakeholders.

5.3 Holloman Air Force Base

History

Holloman Air Force Base (HAFB) was originally planned as an overseas training location for the British military, but was established as Alamogordo Army Air Field in 1942 to serve as a training location for U.S. pilots. From 1942 to 1945, Alamogordo Army Airfield served as the training grounds for over 20 different groups, flying primarily B-17s, B-24s, and B-29s. Typically, these groups served at the airfield for about six months, training their personnel before heading to combat in either the Pacific or European Theater.

After World War II, the future of the base was uncertain but in 1947, a new era began when Air Materiel Command announced the air field would be its primary site for the testing and development of pilotless aircraft, guided missiles, and other research programs. In 1948, the Alamogordo installation was renamed Holloman Air Force Base.

The next era began in 1968, when the 49th Tactical Fighter Wing arrived at HAFB. The 49th's F-4 Phantom IIs introduced a new era of fighter aircraft training and operations, which continued for the next three decades. In 1977, the 49th transitioned to the F-15 Eagle, the Air Force's top air-to-air weapon.

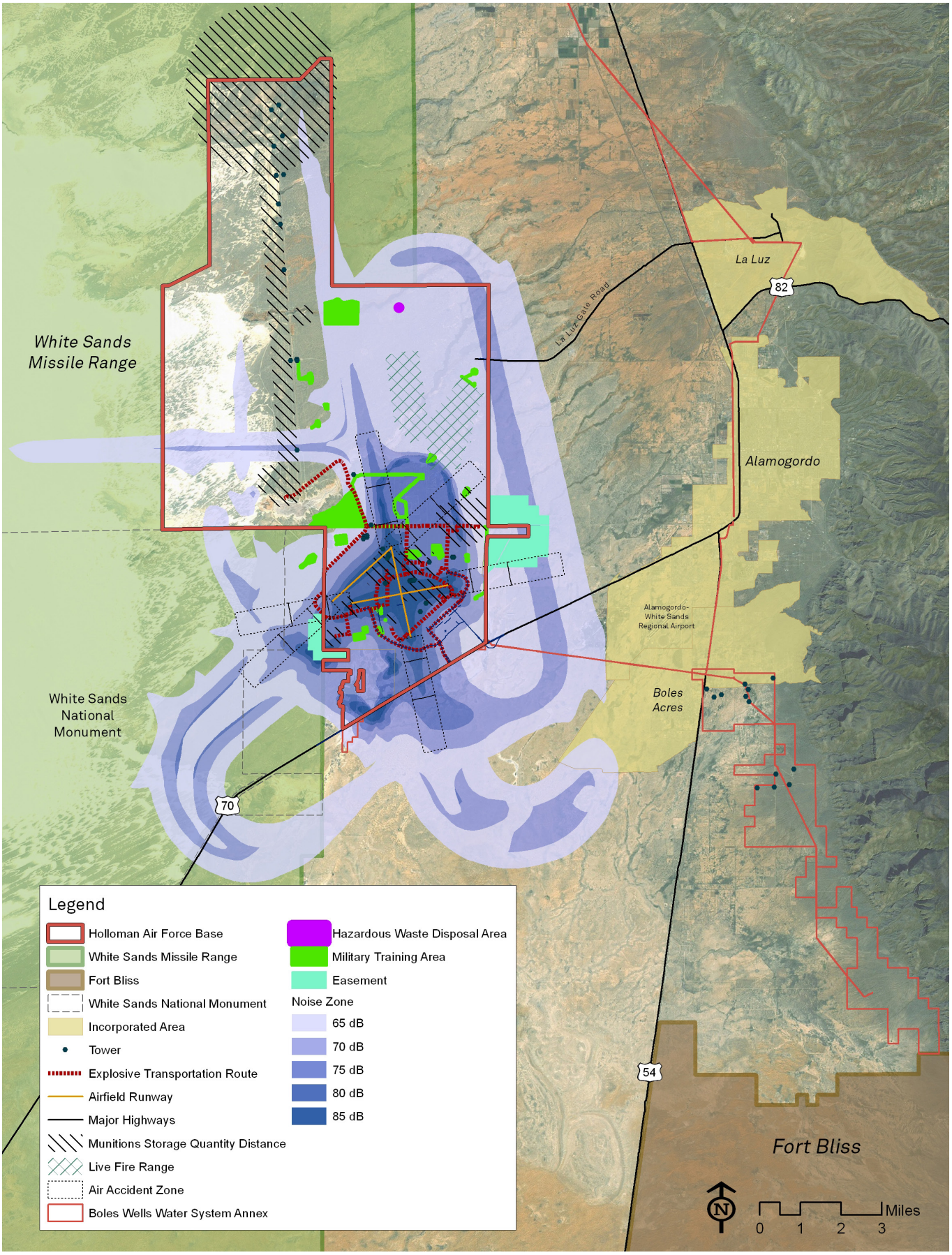
In 1992, HAFB again garnered national attention when the Air Force's most technological fighter, the F-117A Nighthawk made its new home at the base.

The German Air Force Tactical Training Center (GAF TTC) was activated as a tenant unit at HAFB in 1996. This program, based on a memorandum of understanding between the United States and Germany and financed by the German Federal Ministry of Defence, is unique in allowing the permanent stationing of the German Tornado aircraft at HAFB. In 1999, the Tactical Training Center was re-designated the German Air Force Flying Training Center to reflect their growing mission.

Current Mission

HAFB, comprised of about 60,000 acres of DoD owned and withdrawn land, has supported the Air Combat Command (formerly Tactical Air Command) for several decades (see **Figure 5.3**). Through that time, the base has supported combat-ready crew training for a series of fighter aircraft. In the past three decades, the F-4, F-15, F-117 and F-22 aircraft have stationed at HAFB. Currently, HAFB is the home to the 96th Test Group, 49th Wing, and the 44th Fighter Group of the Air Force Reserves. In 2008, the F-117 aircraft were retired and the Wing converted to the F-22 Raptor. The F-22 Raptor trains mostly at higher altitudes and at supersonic speeds. Recently, HAFB began training pilots and sensor operators for the MQ-1 Predator and MQ-9 Reaper RPAs. This new mission increased operations at the HAFB airfield, but training occurs in WSMR restricted airspace. These vehicles are much quieter and do not generate any appreciable noise compared to fighter aircraft.

FIGURE 5.3 HOLLOMAN AIR FORCE BASE AND SURROUNDING AREAS



The 49th Wing also stores and stages Air Transportable Clinics and Basic Expeditionary Airfield Resources (BEAR) Base to remote combat zones world-wide. The BEAR program can deploy a mobile force to an existing airfield with shelters and support facilities capable of independently supporting sustained combat operations without developing a permanent installation. All pre-assembled packages, including full-scale hangars adapted for field assemblage, are C-130 transportable.

Most of the facilities on HAFB are in the south part of the installation (see **Figure 5.3**), directly north of U.S. 70. Facilities in the main cantonment area support over 4,200 personnel working on the base, and their family members. A three-runway airfield has extensive ramp space for various units. Farther north, most of the land on HAFB is undeveloped with isolated facilities serving specific functions. For example, HAFB operates a Solar Observatory to observe coronal mass ejections. The National Geospatial-Intelligence Agency (NGA) mission has facilities at HAFB and WSMR. The NGA provides accurate analysis of worldwide gravity, satellite, and positional information, including imagery and mapping control for navigation, safety, intelligence, positioning and targeting in support of national security objectives. The Alamogordo Primate Facility operated by the National Institute of Health also operates on HAFB north of the airfield.

Figure 5.3 also illustrates the Accident Potential Zones (APZs) and noise contours associated with aircraft operations at HAFB (see **Section 8** for a complete description of these zones).

HAFB has had a long relationship with WSMR, using both facilities on the range and the extensive restricted airspace. Aviation units operate beyond the immediate environs of the base in this regional special use airspace, including Military Training Routes (MTRs), Military Operations Areas (MOAs), restricted airspace, and aerial refueling tracks (ARs). **Figure 5.4** shows airspace used by HAFB units. As missions and aircraft change at HAFB, the utilization of HAFB airspace has varied over time. In addition to facilities on HAFB, the Air Force also manages and uses two air-to-ground bombing ranges at WSMR (Red Rio and Oscura) and one on Fort Bliss (Centennial Range). The F-22 mission has utilized WSMR's R-5107 complex, particularly the blocks of higher altitude airspace, which are approved for supersonic operations. The F-22 aircraft are scheduled to depart in 2014, with a new pilot training mission flying F-16 aircraft projected to replace them.

HAFB also hosts several major partner/tenant organizations. These partners are listed below with a brief description of their mission.

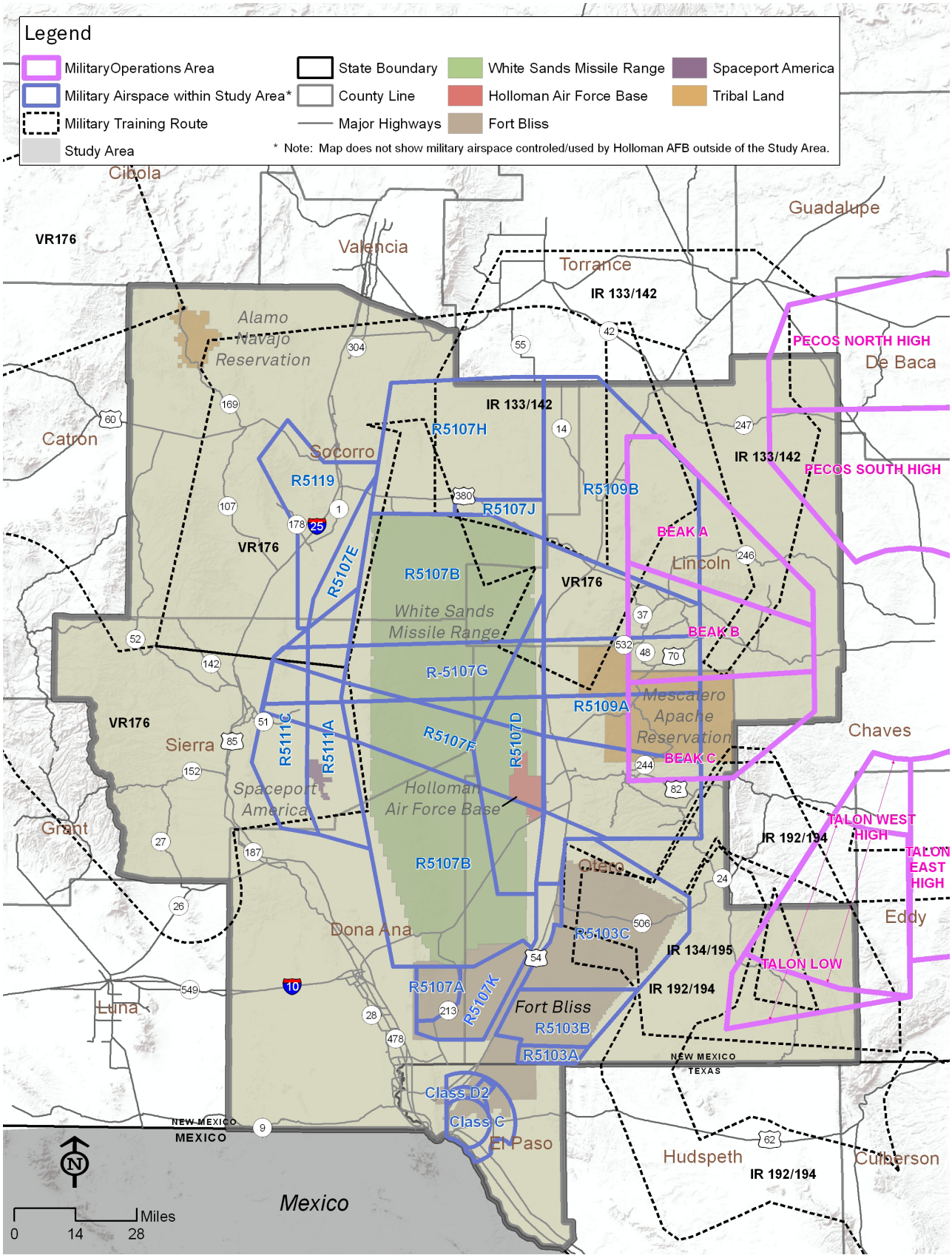
- The German Air Force (GAF) has based and trained aircrews in the Tornado aircraft since the late 1990s. GAF training uses HAFB's MTRs, MOAs, and air-to-ground bombing ranges. Notable is that the GAF trains as low as 100 feet AGL in MTRs. The 49th Wing and GAF are the primary users of MTRs and MOAs in the region and Oscura and Red Rio Bombing Ranges on WSMR and Centennial Bombing Range on Fort Bliss. Several low-level MTRs feed into Fort Bliss and WSMR restricted airspace (including VR-176, IR-133/142, IR-134/195 and IR 192/194). Current use of these MTRs by F-22 aircraft is rare, while use by the GAF Tornados is daily.

- The anticipated F-16 mission will use MTRs daily. Also, the F-16 mission will expand the use of Centennial Range on Fort Bliss for air-to-ground training, similar to use by the former F-117 mission.

- The 96th Test Group (TG) provides test and evaluation support to several resident units and Army and Navy test programs, many using facilities and performing tests on neighboring WSMR. The 846th Test Squadron maintains HAFB's High Speed Test Track (HSTT) that is used for research on ejection seats, rockets, parachutes, and bomb penetration. During tests, payloads and instrumentation are moved along a straight-line path by means of rocket sleds at speeds up to Mach 10. The HSTT simulates a controlled flight environment. The 96th TG operates the Radar Target Scatter (RATSCAT) and RATSCAT Advanced Measurements (RAMS) facilities.

- The 586th Flight Test Squadron supports advanced avionics and weapons flight tests. The squadron provides aviation support for a variety of test programs on WSMR. The squadron primarily flies modified AT-38B and C-12J aircraft. The squadron provides aerial tracking, test platforms, range sweep and recovery services, aerial reconnaissance and photo/safety chase aircraft for operational testing on WSMR of guidance, laser, air-to-air, air-to-ground, long range and standoff weapons, and live warhead testing program.

FIGURE 5.4 — REGIONAL AIRSPACE



- The 746th Test Squadron's Central Inertial and GPS Test Facility (CIGTF) on HAFB supports testing of GPS equipment and navigation systems. Tests are performed both in laboratory settings and open environments. Of note is an annual testing and training event that provides a realistic jamming environment for training and testing anti-jam technologies. The squadron and CIGTF support both military and non-military test programs. The CIGTF is located adjacent to WSMR. The facility offers in-depth test-article performance evaluation and analysis as part of its GPS integration mission.

- The 781st Test Squadron operates the National Radar Cross Section Test Facility (NRTF) on WSMR that measures aircraft radar signatures for use in developing stealth technologies.

- 4th Space Control Squadron operates an offensive, ground-based, mobile counter communication system (CCS).

- The Acoustic Research Complex (ARC) is a unique facility operated by the Air Force Research Laboratory (AFRL) on WSMR. It is used to help with the design, modification, and increasing combat survivability of current and future aircraft. A large area microphone array with sensors along the flight path, as well as in the vertical enable 3-D capture of the radiated acoustics for any air vehicle. The ARC measures the noise radiated in all three dimensions simultaneously under various operational dynamic flight conditions. The measurement station consists of microphone locations near the ground and acoustically instrumented tall towers for rotary wing, RPA, fixed wing heavy, and high performance aircraft. This facility requires a noise and vibration free environment.

HAFB is currently preparing a Draft Installation Complex Encroachment Management Action Plan (ICEMAP). This report will describe the interface between HAFB, WSMR, and Fort Bliss and the shared assets that these installations use.

Foreseeable Mission

Current test and training is expected to continue at HAFB in the future. Foreseeable changes are described below.

- HAFB recently announced that the F-22s will move to Tyndall AFB, and two squadrons of F-16 aircraft will move from Luke AFB to HAFB. The first squadron is planned to arrive in 2014, followed by another in 2015. The new F-16 mission will focus on basic pilot training under the Air Education Training Command (AETC). The F-16 aircraft has an air-to-ground combat role, so that aircrews will spend more of their flying hours at lower altitudes using regional MTRs with less use of high altitude restricted airspace and at bombing ranges on WSMR and McGregor Range on Fort Bliss. The F-16 mission will increase the number of daily operations from HAFB each day from the 6-8 operations that occur with the F-22s to about 60 daily for the F-16s. These operations include daily pattern work at the airfield for pilot training qualification courses. To ease congestion in WSMR airspace, HAFB may propose airspace modifications to existing MOAs. F-16 training will saturate McGregor Range and will involve more night missions by both F-16 aircraft and the GAF. The Air Force considers 1,000 feet AGL the upper limit for effective low-level training. The Southern New Mexico Economic Sustainability and Compatibility Workgroup (SNMECW) is addressing airspace capacity concerns considering this new mission, along with projected increased use of restricted airspace for Spaceport operations. The departure of the F-22 aircraft will reduce the frequency of sonic booms; however, the F-16 would train low and fast in MTRs, shifting the locations where aircraft noise is experienced and the type of impact. In the larger picture, this shift reflects a pattern more typical of the 1990s.

- HAFB is also anticipating expansion of the RPA mission, with beddown of another formal training unit for the MQ-1 Predator and MQ-9 Reaper in the near future in addition to the squadron that arrived in 2009. RPA operations mostly occur in restricted airspace (R-5107 over WSMR). RPA missions use approved airspace; usually restricted airspace or a MOA through a Certificate of Authorization (CoA) issued by FAA. This mission needs ground access; therefore restricted airspace or operation over DoD land is the best combination. The RPA mission may utilize airspace over WSSH, WHSA, San Andres National Wildlife Refuge, or JER to reduce conflicts with other range operations and other training by the Air Force.

- Planning is ongoing for a possible conversion of GAF FTC from the Tornado to Eurofighter aircraft.

- The HAFB population will likely increase due to the foreseeable mission changes, but not above levels seen in the past two decades. HAFB has provided for its domestic water supply using both groundwater and surface water from Bonito Lake in the Sacramento Mountains. Widespread forest fires in the past few years have made the lake supply unusable until the ecosystem recovers. Instead, HAFB is relying on its well fields and groundwater sources. While this supply is adequate for HAFB's projected needs, the recent collapse of the main well and cumulative drawdown of the aquifer by increasing numbers of private wells is a concern.

- The 96th TG will continue its current test programs. Possible facility expansions for the NRTF and RAMS site on WSMR reflect the increase in demand for this program.

Compatibility Factors

The following list identifies the major compatibility factors that affect surrounding communities, or inversely, the HAFB mission based on a review of six documents (see the **Appendix** for a listing of the documents and more detailed summary of information obtained).

The primary compatibility issue for HAFB as identified in plans and studies has been noise associated with aircraft operations in the local area of Alamogordo and regional special use airspace. Noise also affects residents and some sensitive locations such as national parks and monuments. Secondary issues include water supply and demand and the effects of fluctuations in the base population on the local economy and infrastructure.

- Large numbers of aircraft operations, using high performance fuels, pose concerns about air quality, air pollution, and greenhouse gas emissions. The military is required to track and account for its emissions with regulatory agencies on a regular basis to demonstrate that emission levels do not exceed regulatory thresholds. Doña Ana County has locations with non-attainment concerns related to ozone and particulate matter.

- The increase in military activity in MOAs and MTRs and in uncontrolled airspace raises concerns about risk of accidents for civilian aviation. Some pilots will choose to avoid these areas when active even though see-and-avoid rules allow for shared use. This is an inconvenience and can modify local and commercial air traffic patterns.

- Noise and vibration effects from military aircraft operations are some of the primary compatibility concerns for HAFB missions. For the current F-22A training mission, some residents in the Sacramento Mountains and eastern Las Cruces communities have reported disturbance from sonic booms. Several factors influence how a sonic boom propagates, including altitude of the aircraft and atmospheric conditions. Subsonic noise from low-level, high-speed aircraft operations in MTRs and MOAs cause loud noise and can startle persons and animals on the ground, interrupting activities and potentially causing unsafe situations. Vibration from sonic and subsonic noise can damage structures, particularly historic properties that are more vulnerable to deterioration.

- Aircraft operations can cause incompatible noise exposure for residential areas and areas valued for their quiet or peaceful qualities, such as wilderness areas, national parks and monuments, and wildlife refuges. HAFB has defined and published special flight avoidance procedures for several locations in the region (such as ranches, business locations, parks/monuments, refuges) to minimize noise disturbance.

- Vibration and noise from sonic and subsonic noise disturbs domestic animals, some raised for commercial purposes (e.g. cracking of chicken eggs, nest abandonment, startle response of livestock or farmed-raised ostriches).

- Noise in training airspace could cause negative effects to transient, migratory threatened, endangered, and sensitive avian species and other wildlife. Issues pertaining to protected species are coordinated by HAFB with the USFWS.

- There is some risk to aircraft operations by bird aircraft strike hazards (BASH). During migration seasons, birds and aircraft are prone to collision at certain altitudes and along predictable routes. The Air Force is very concerned about BASH and has a program that tracks bird migrations and disseminates information so that each installation can brief pilots about local hazards according to actual seasonal conditions.

- HAFB is an economic driver for Otero County, the City of Alamogordo, and other smaller communities; Las Cruces and El Paso are affected to a lesser degree. Historically, missions have fluctuated, causing variation in the number of personnel and family members at HAFB. The fluctuations are felt in the local housing market, local businesses, and community services and can affect city and county revenues, as well as artificially depress new business investment.

- Chaff (a radar countermeasure in which aircraft spreads a cloud of small, thin pieces of fiber) and flares have been used by HAFB aircrews for many years. Several concerns have been raised about chaff and the potential to contaminate soils, causing indirect impacts to wildlife or domestic animals through possible ingestion, inhalation, or skin irritation. The chaff used for aircrew training at HAFB is aluminum coated glass fibers – both widespread, naturally occurring components of soil. Chaff is approved for use above specified altitudes to allow for dispersal of the fibers. Properly functioning and dispensed chaff does not concentrate at levels of concern in the environment, according to Air Force studies.

- Concerns exist about the use of flares during training and the potential for wildlife ignition, especially during times of drought and high fire risk. Recent forest fires have radically altered mountain ecologies, causing loss of vegetation and soil and sedimentation of lakes. This has had a major impact on regional surface water supplies, as well as on local tourism.

- Similarly, chaff can interfere with air traffic radars. The FAA has placed more stringent restrictions on the DoD use of any type of chaff that operates within the bands used by air traffic control radar and navigational systems. In taking the more conservative approach to air traffic control and flight safety, the FAA has limited or placed restrictions on the locations, altitudes, and/or time periods within which specific types of chaff can be employed.

F-22 Raptor prepares to take off

- High energy electromagnetic radiation (EMR) emissions can cause accidental detonation of explosives or fuels and may pose safety hazards. GPS testing at HAFB is known to jam the frequencies used by GPS equipment locally. The potential effects of frequency/spectrum interference and its management has been expressed as a concern of private citizens and commercial operations, and it may also be a concern for the operation of specialty equipment such as pace makers.

06 OVERVIEW OF PREVIOUS COMPATIBILITY ACTIONS AND ONGOING INITIATIVES

6.1 Federal and Department of Defense Compatibility Initiatives

Department of Defense entities have a variety of tools available to mitigate the impacts of operational activities and to promote compatibility with surrounding communities. This section summarizes existing planning, financing, and communication mechanisms designed to promote compatibility within the study area. Many of these measures are currently in place within the SNM-EP region and the JLUS will continue to highlight opportunities to build on these previous efforts.

Air Installation Compatibility Use Zone
In 1972, the DoD established the Air Installation Compatibility Use Zone (AICUZ) program to assist the military and surrounding communities in studying land use compatibility around bases with an aviation component. The AICUZ process results in the mapping of those areas off of the base that are exposed to aircraft noise and safety factors and proposes a series of communication, operational or regulatory approaches to reduce known and foreseeable impacts and encourage compatible civilian development. HAFB conducted an AICUZ in 2004 and will update the document following transition from the F-22 aircraft to the F-16 aircraft. The type of aircraft operating at a base affects the surrounding sound footprint and the new AICUZ is intended to more accurately reflect the noise associated with the F-16 mission.

Installation Complex Encroachment Management Action Plan
The Installation Complex Encroachment Management Action Plan or ICEMAP is an Air Force program that focuses on encroachment management, conservation partnership, mission sustainment, compatible development, and stakeholder engagement. Though similar to the JLUS, this initiative provides a more detailed analysis of the installation's internal and external encroachment challenges. HAFB is recently conducted an ICEMAP exercise and the JLUS planning team has coordinated its findings with this effort.

Joint Land Use Study
In 1985, the DoD initiated the JLUS program to create a community-based framework for land use planning around military installations. As noted previously, the SNM-EP JLUS is funded by a grant from the DoD's Office of Economic Adjustment (OEA) as part of this program. As of January 2012 more than 90 defense communities across the United States have completed a JLUS.

Readiness and Environmental Protection Initiative
Although the DoD purposefully sought out remote areas for the construction of installations, many of today's centers of testing and training are major economic drivers that sit within the path of advancing urban and suburban development. In an effort to protect the future use of installations and training land, Title 10, Section 2684a of the United States Code authorized the Military Services (Army, Navy, Marine Corps, and Air Force) to enter into agreements with non-federal conservation organizations to collaborate on long-term open space protection.

The Readiness and Environmental Protection Initiative (REPI) grants the military the ability to enter into agreements with eligible entities, such as local governments, non-governmental organizations, and willing land owners to secure conservation easements on property near a military installation or military airspace.

The agreements enable organizations to acquire, on a cost-shared basis, development interests in the properties of voluntary sellers. The property owner typically continues to hold the title for the land, but receives monetary compensation and tax breaks to maintain the encumbered property in a highly limited use that preserves habitat and avoids interference with the operational procedures of the nearby installation. Through Fiscal Year 2012, the REPI program has allocated approximately $215 million in funds to protect more than 260,000 acres of land across the U.S.

The Army implements REPI projects through its Army Compatible Use Buffer (ACUB) program. Fort Bliss has successfully used the ACUB to enter into a 75-year agreement with the NMSLO to create a buffer zone of approximately 5,200 acres on lands south of Doña Ana Range near the community of Chaparral. The agreement restricts the development of noise-sensitive uses (i.e. residential, educational, and medical care) in the buffer zone. Fort Bliss is pursuing similar conservation efforts for land south and east of the installation's South Training Area.

The U.S. Department of Agriculture (USDA), U.S. Department of the Interior (Interior) and the DoD have also recently announced a new federal, local, and private collaboration to preserve agricultural lands, assist with military readiness, and restore and protect wildlife habitat. Through the Sentinel Landscapes partnership, the agencies will work together in overlapping priority areas near military installations to help farmers and ranchers make improvements to the land that benefit their operation, enhance wildlife habitat, and enable DoD's training missions to continue. The partnership will begin with a pilot project in the South Puget Sound region of Washington State, home to Joint Base Lewis-McChord. The DoD, USDA's Natural Resources Conservation Service (NRCS), Interior's U.S. Fish and Wildlife Service and partner organizations will invest more than $12.6 million to restore and protect 2,600 acres of original native prairie habitat on both public and private lands. The departments are reviewing additional sites for the partnership.

Installation Operational Noise Management Plan

The Installation Operational Noise Management Plan (IONMP) is a tool used to identify areas affected by noise resulting from installation operations and develop communication, land use, and operational procedures to minimize exposure on the surrounding communities.

The Fort Bliss IONMP has identified potential noise impacts off the installation for large caliber weapons training on its ranges and for military aircraft (helicopters) operating out of Briggs Army Airfield.

Department of Defense Siting Clearinghouse

With the growth of the renewable energy sector, the DoD is increasingly called on to evaluate the compatibility of proposed wind, solar, transmission, and other projects for their effects on military activities. Created in 2010, the Siting Clearinghouse aims to establish a "one-stop-shop" for the comprehensive, timely, and transparent review of projects and the exploration of mitigation strategies. The mission of the Clearinghouse is to protect DoD mission capabilities from incompatible energy development by collaborating with DoD entities and external stakeholders.

The Clearinghouse oversees both a formal and informal project review process. The formal process usually begins with the referral of a project that was submitted for permitting through the FAA's Obstruction Evaluation/Airport Airspace Analysis (OE/AAA) program. The informal process begins when a proposed project is elevated by other federal departments and agencies, such as the BLM, a state or local government agency, an Indian tribe, or a landowner. Informal reviews are only advisory, and no authoritative DoD position on a project is prepared until the formal review process is initiated.

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

Department of Defense Resource Management Plans

Military installations produce both cultural and natural resource management plans that outline overarching strategies to manage sensitive assets. The Integrated Natural Resource Management Plans (INRMPs) enables a DoD installation to implement management practices for their natural resources and facilitate coordination with various stakeholders.

The goal of the planning process is to promote biodiversity and ecosystem sustainability, while maintaining no net loss of mission capability. Similarly, the Integrated Cultural Resources Management Plan (ICRMP) establishes compliance status, stakeholder and agency roles and responsibilities, documents site data, and develops standard operating procedures to manage important cultural resources on military lands.

All three of the installations in the region have used these strategic planning frameworks to identify sensitive resources and develop management procedures. In some cases, planning has resulted in memoranda and agreements for specific avoidance areas or other mitigation actions.

Department of Defense Energy and Water Initiatives
The DoD has launched several initiatives to reduce its energy use by improving efficiency and shifting to renewable sources such as biomass, hydropower, geothermal, wind, and solar to meet operational and installation needs. Various statutes and executive orders also mandate continued reductions in energy and water consumption by federal entities.

To meet mandates, the Army published the Army Energy Security Implementation Strategy in 2009 with the following goals:

- Reduce energy consumption;
- Increase energy efficiency across platforms and facilities;
- Increase use of renewable/alternative energy supplies
- Assure access to sufficient energy supplies; and
- Reduce adverse impacts on the environment.

The Air Force has also published an Air Force Energy Plan with the vision of reducing energy demand by installations and operations, using renewable and alternative energy wherever possible, and enhancing energy awareness in daily operations.

The Army set a specific goal to have five installations achieve Net Zero energy goals by 2020, which means that the installation produces as much energy on site as it uses. After designation as one of the Army's Net Zero energy installations, Fort Bliss prepared an EIS to assess the effects of potential energy, water, and waste resources initiatives. Actions evaluated in the EIS include:

- Aggressive implementation of waste reduction, and energy and water conservation policies and practices;
- Construction of a new pipeline to transport reclaimed water for best uses on Fort Bliss;
- Construction of a Waste-to-Energy plant with adjacent landfill in the Southern Training Area of Fort Bliss, or on land to be exchanged with the Texas General Land Office;
- Development and construction of dry-cooled concentrating solar thermal arrays in Fort Bliss Southern Training Area;
- Development of geothermal resources on Fort Bliss in New Mexico for power generation and heating;
- Development of existing wind energy resources on the eastern central and northern portions of Fort Bliss in New Mexico; and
- Development of up to 20 MW of natural gas powered turbines as a complementary source of back-up power to renewable energy facilities.

6.2 Regional Initiatives

Western Regional Partnership
In 2007, the DoD partnered with representatives of federal agencies and state and tribal leadership in the States of Arizona, California, Nevada, New Mexico and Utah to establish the Western Regional Partnership (WRP).

The WRP mission is to advance shared planning, land management, and policy goals in support of sustainability, homeland security, and military readiness. Partnership committees focus on some of the western region's most pressing issues, including sustainable land use, wildlife protection, energy development and energy security, disaster preparedness, border security and collaboration with tribal governments. The WRP includes multiple committees that work to identify issues, explore solutions, and improve interagency cooperation at the local, regional, state, and federal level. These committees include:

- Energy;
- Military Readiness, Homeland Security, Disaster Preparedness and Aviation;
- Natural Resources; and
- Tribal Relations.

6.3 State Compatibility Initiatives

New Mexico
New Mexico Executive Order No. 2004-046
In August 2004, Governor Bill Richardson issued Executive Order Number 2004-046 with the purpose of encouraging compatible land use development around New Mexico's military installations. The order directed state agencies and entities to become involved in compatible military planning efforts and initiatives and also recommended that jurisdictions and municipalities adopt land use plans to ensure compatible development around military installations.

New Mexico Real Estate Disclosure
Real estate disclosure is governed by the New Mexico Real Estate Disclosure Act, found in Statute 47-13-1 through 47-13-4. The Real Estate Disclosure Act requires that a real estate buyer be notified of certain property tax obligations and estimates, but does not mandate disclosure of specific real property conditions. Current New Mexico law does not require sellers to notify prospective buyers of a property's proximity to military installations or noise issues. However, some voluntary real estate disclosure forms, such as the REALTORS Association of New Mexico (RANM) property disclosure form, requests that a seller note whether or not the property is exposed to any "excessive noises" and lists airplanes as a potential source.

New Mexico Military Base Planning Commission
Established in 1978 and recognized by the Office of the Secretary of Defense as a model state-program, the Military Base Planning Commission participates in planning initiatives and studies the economic impacts of military installations in the State of New Mexico. The Commission also collaborates with organizations to ensure the long-term viability of military installations and facilitates communication among federal, state, local, and military stakeholders. Military Base Planning Commission responsibilities include:

- Obtaining and evaluating information about the federal government's plans, policies, and initiatives relative to military base realignment and closure;
- Working with and providing assistance to community organizations that have as their purpose the long-term viability of the military bases in their local area;
- Ensuring collaboration between community organizations;
- Working with and providing assistance to the state's congressional delegation on matters relating to federal base realignment and closure plans; and
- Advising the Governor on measures necessary to ensure the continued presence of military bases in the state.

New Mexico Office of Base Planning and Support
Created pursuant to New Mexico Statute 9-15-48, the Office of Military Base Planning and Support operates as part of New Mexico's Department of Economic Development. The office supports the Military Base Planning Commission, acts as a liaison between state, military, and local organizations, keeps the state informed of military planning needs and initiatives, and works with communities to protect military missions in the state. The Office of Base Planning and Support is a key partner in the SNM-EP JLUS and has played a role in supporting the completed JLUS at Kirtland AFB.

Texas
Real Estate Disclosure
In Texas, real estate disclosures are intended to inform homebuyers of property conditions in advance of the purchase of a home. The Texas Property Code (Section 5.008) requires the seller of a residential property to give the purchaser a written notice disclosing the general condition of the property. At a minimum, the property owner must disclose information contained on notices from the Texas Real Estate Commission (TREC) (form OP-H) or Texas Association of Realtors (TAR)® (form 1406). TAR Form 1506, General Notice to a Buyer, is another typically used form. Currently, however, real estate disclosures in Texas are not required to disclose proximity to military installations.

Texas Military Preparedness Commission
In 2003, the state created the Texas Military Preparedness Commission within the Office of the Governor to assist local defense communities in identifying and using economic development resources that enhance the military value of their installations. The Commission's charge is to preserve and expand Texas's 18 major military installations and their missions, and assist those communities affected by BRAC action. The Commission advises the Governor and Legislature on defense-related issues affecting Texas military installations, and seeks additional defense missions for the state by working with local government and community leaders and senior military officials. Through its Annual Report: Master Plan for the Future publication, the Commission supplies information on military installations and recommendations to enhance the value of bases in the state.

Local governments can also seek financial assistance through the Defense Economic Adjustment Assistance Grant and Texas Military Value Revolving Loan Fund programs that assist defense-dependent communities in undertaking capital or infrastructure improvements that address the demands of an expanded military mission.

Texas Local Government Code - Section 397.005 - Consultation with Defense Base Authorities
If a defense community determines that a proposed ordinance, rule, or plan may affect a base or the military exercise or training activities connected to the base, the community must seek comments from the defense base authorities about the compatibility of the proposed action with military operations. The community must then consider and analyze the input before making a final determination on the ordinance, rule, or plan. This subsection applies only to a defense community that includes a municipality with a population of more than 110,000 located in a county with a population of less than 135,000 and that lacks airport zoning regulations.

Texas Local Government Code §240.032 – County Authority to Regulate Lighting
Texas law allows counties with a population of more than 1 million and containing at least five U.S. military bases (and any county adjacent to that county that is within 5 miles of a base) to adopt orders at the request of a base to regulate outdoor lighting within five miles of the installation. This legislative action was specifically adopted to allow Bexar County (San Antonio) to enact outdoor lighting restrictions to protect the Camp Bullis Army Training Facility from urban encroachment and associated light trespass.

07 GROWTH TRENDS AND REGIONAL INFRASTRUCTURE

7.1 Regional and Community Population Trends

2000 to 2012 Population Growth Rates

In 2010, the six-county JLUS area supported a total population of 1.1 million residents. The region overall saw strong population growth in the previous two decades with an average annual growth rate of 1.61 percent (see **Table 7.1**). This rate dipped slightly from 2010 to 2012. The region's major urban centers of Las Cruces and El Paso have anchored most of this population expansion. However, communities such as Ruidoso and Ruidoso Downs also grew quickly, particularly in the 1990s and 2000s due to an influx of retirees. The economic downturn of 2008 continues to dampen development in some parts of the region, but El Paso County and its cities continued to see robust growth rates during the pre-recession years as a result of the 2005 BRAC. The effects of the military on surrounding communities are demonstrated even more clearly in Otero County and the City of Alamogordo. The relatively smaller size of Alamogordo makes it more vulnerable to the fluctuations in military personnel. Unincorporated areas within the region have also added residents within the last two decades.

	1990	2000	2010	Pop Estimate 2010	Pop Estimate 2012	Average Annual Growth 1990-2010	Average Annual Growth 2010-2012
Doña Ana County	**135,510**	**174,682**	**209,233**	**210,325**	**214,445**	**2.2**	**0.97**
Hatch	1,318	1,673	1,648	1,656	1,680	1.12	1.45
Las Cruces	62,648	74,267	97,618	98,200	99,665	2.24	1.49
Mesilla	1,976	2,180	2,196	2,210	2,244	0.53	1.54
Sunland Park	8,357	13,309	14,106	14,192	14,407	2.65	1.51
Balance of County	61,211	83,253	93,665	94,219	95,602	2.15	1.47
Lincoln County	**12,219**	**19,411**	**20,497**	**20,473**	**20,309**	**2.62**	**-0.4**
Capitan	840	1,443	1,489	1,490	1,485	2.9	-0.34
Carrizozo	1,075	1,036	996	996	994	-0.38	-0.2
Corona	215	165	172	172	171	-1.11	-0.58
Ruidoso (village)	4,636	7,698	8,029	8,030	8,010	2.78	-0.25
Ruidoso Downs	917	1,824	2,815	2,792	2,787	5.77	-0.18
Balance of County	4,536	7,245	6,996	7,023	7,007	2.19	-0.23
Otero County	**51,928**	**62,298**	**63,797**	**64,319**	**66,041**	**1.03**	**1.33**
Alamogordo	27,986	35,582	30,403	30,666	31,327	0.42	2.16
Cloudcroft	612	749	674	680	695	0.48	2.21
Tularosa	2,753	2,864	2,842	2,868	2,930	0.16	2.16
Balance of County	20,577	23,103	29,878	30,126	30,751	1.88	2.07
Sierra County	**9,912**	**13,270**	**11,988**	**12,018**	**11,895**	**0.96**	**-0.51**
Elephant Butte[1]		1,390	1,431	1,434	1,425		-0.63
Truth or Conseq	6,224	7,289	6,475	6,491	6,451	0.2	-0.31
Williamsburg	463	527	449	451	448	-0.15	-0.67
Balance of County	3,225	4,064	3,633	3,641	3,619	0.6	-0.6
Socorro County	**14,764**	**18,078**	**17,866**	**17,846**	**17,603**	**0.96**	**-0.68**
Magdalena	844	913	938	937	939	0.53	0.21
Socorro	8,207	8,877	9,051	9,053	9,055	0.49	0.02
Balance of County	5,713	8,288	7,877	7,879	7,879	1.62	0
NM JLUS Region	**224,333**	**287,739**	**323,381**	**324,981**	**330,293**	**1.85**	**0.81**

Table 7.1 | Regional Population Growth and Incorporated Cities, 1990 - 2012

Source: 1990-2010 Population Counts by Decennial Census, U.S. Census Bureau. Found at www.census.gov
2010 and 2012 July 1 estimates, Population Estimate Program, U.S. Census Bureau. Found at www.census.gov

El Paso County	591,610	679,622	800,647	803,506	827,398	1.52	1.48
Anthony	3,326	3,850	5,011	5,023	5,090	2.07	1.33
Clint	1,033	980	926	930	950	-0.55	2.15
El Paso	515,652	563,662	649,152	651,881	665,568	1.16	2.1
Horizon City	2,308	5,233	16,730	16,802	17,161	10.41	2.14
San Elizario[2]	4,205	11,046	13,603			6.05	
Socorro	23,043	27,152	32,013	32,149	32,834	1.66	2.13
Vinton	597	1,892	1,971	1,980	2,021	6.15	2.07
Balance of County	41,446	65,807	88,621	95,230	97,166	3.87	2.03
Texas JLUS Region	**591,610**	**679,622**	**800,647**	**803,506**	**827,398**	**1.52**	**1.48**
JLUS REGION TOTALS	**815,943**	**967,361**	**1,124,028**	**1,128,487**	**1,157,691**	**1.61**	**1.29**

Table 7.1 | Regional Population Growth and Incorporated Cities, 1990 - 2012 (continued)

The unincorporated colonia of Chaparral, which straddles both Doña Ana and Otero Counties, experienced dramatic growth since 1990 (see **Table 7.2**). Census data are thought not to reflect the actual population in Chaparral. County calculations based on a door-to-door survey and the assumption of a higher figure for persons per household than is typically used by the Census Bureau in its population estimates suggest that the community has more than 20,000 residents. The Santa Teresa area of Doña Ana County has also experienced significant growth and ongoing industrial and commercial investment, spurred by the Union Pacific rail facility and the Santa Teresa International Port of Entry.

Table 7.3 reinforces the major social and economic presence of the three installations within the six-county study area. Active military personnel, civilian workers, and dependents comprise roughly 10 percent of the total regional population. As always, military missions and the number of personnel assigned to installations are subject to great fluidity. The Army has recently announced plans to shrink its active component end strength by eliminating brigade combat teams. The planned force restructuring could affect Fort Bliss and WSMR. The net loss for Fort Bliss is anticipated to be approximately 750 people. The economic impact assessment element of the JLUS has been delayed until November of 2013 to enable analysis of the most current and accurate personnel figures at the three installations.

Year	Population	Percent Change
1990	2,962	-
2000	6,117	106.5%
2010	14,631	139.2%

Table 7.2 | Chaparral Population Growth, 1990 - 2010

Source: 1990-2010 Population Counts by Decennial Census, U.S. Census Bureau. Found at www.census.gov

	Fort Bliss	HAFB	WSMR	Total
Military	35,411	4,577	759	40,747
Civilian	10,793	1,378	5,261	17,432
Dependents	44,837	5,829	3,408	54,074
TOTAL	**91,041**	**11,784**	**9,428**	**112,253**

Table 7.3 | Population Estimates for SNM-El Paso Military Installations, 2012

Source: Installation commands at Fort Bliss and HAFB; population data retrieved from WSMR EIS, WSMR Public Affairs Office.

Regional Population Projections, 2015 to 2040

Population projections indicate that growth is likely to continue throughout the region in the decades ahead, particularly within El Paso and Doña Ana Counties. The region is anticipated to approach 1.5 million residents by 2040, an increase of over 30 percent from the 2010 population base (see **Table 7.4**). This analysis chose a single source of projections across all counties for easier comparison among jurisdictions. The cities and counties often use their own growth assumptions for local planning purposes. The One Valley One Vision 2040 Plan, for example, projects a total population of 325,000 in Doña Ana County by the year 2040, about 25,000 more residents than shown in the state population projection for the county.

Regional Land Tenure and Existing Land Use

Tenure patterns throughout the JLUS region are a complex mix of private, state, federal and tribal lands (see **Figure 7.1**). Along with local governments, federal and state agencies with land management responsibilities include the BLM, DoD, U.S. Bureau of Reclamation, U.S. Department of Agriculture, U.S. Fish and Wildlife Service, National Park Service, U.S. Forest Service, New Mexico State Land Office (NMSLO), and the New Mexico Department of Game and Fish (note: data on land ownership within El Paso County is currently unavailable and the planning team is continuing to identify alternate Geographic Information System data sources to map land use tenure within the county).

As **Figure 7.1** illustrates, the BLM is a major presence in the region, administering land adjacent to all three installations. McGregor Range is a co-use area managed by the DoD and BLM, but the land has been formally withdrawn by legislation to accommodate military training and is depicted as part of Fort Bliss.

The NMSLO also holds land in keys areas near military operations or identified impacts, including land east of the City of Las Cruces, around Chaparral, and north of WSMR. Private land largely follows the major transportation corridors of the region, such as I-25 and U.S. 54.

One of the challenges of land use planning in the SNM-EP region is that any current classification of land ownership or existing use does not fully represent the development potential or the range of actual activities associated with a particular piece of land. While some tenure designations, such as the NPS, USFS, and state parks firmly establish protection for lands and indicate long-term stability in status, other designations, including BLM and NMSLO lands may be subject to transfer to other public or private entities for specific management or development purposes. The potential for such transfers brings instability to land tenure in the region. The BLM may sell, lease, exchange or withdraw its land to meet community growth needs, acquire or protect a resource, consolidate public land or serve a national priority.

Any such tenure adjustments require additional analysis under the NEPA process. The TriCounty Draft Resource Management Plan/Environmental Impact Statement identifies those areas that would be available for potential disposal under various management alternatives and the final version of the RMP will set the framework to guide future disposal actions. Much as with the disposal of land by the BLM, NMSLO holdings may be subject to lease, sale or exchange to produce a higher and better economic use that maximizes revenue generation for trust beneficiaries. Privately held lands, particularly in most of the unincorporated areas of the study area also have greater flexibility to evolve toward more intensive uses.

County	2010	2015	2020	2025	2030	2035	2040
Texas	25,145,561	26,295,613	27,373,633	28,376,188	29,289,940	30,103,114	30,823,109
El Paso	800,647	846,942	894,137	940,643	983,892	1,023,836	1,061,739
New Mexico	2,065,826	2,208,450	2,351,724	2,487,227	2,613,332	2,727,118	2,827,692
Doña Ana	210,536	226,855	243,164	258,887	273,513	286,818	299,088
Lincoln	20,497	21,104	21,577	21,875	21,979	21,959	21,888
Otero	64,275	65,542	66,367	66,825	67,047	67,064	66,841
Sierra	11,988	12,020	12,048	12,100	12,218	12,421	12,737
Socorro	17,866	17,998	18,008	17,879	17,621	17,274	16,857

Table 7.4 | Regional Population Projections, 2015 to 2040

Source: Source: New Mexico County Population Projections July 1, 2010 to July 1, 2040, Geospatial and Population Studies Group, University of New Mexico. Released November 2012.

Source: Texas Population Projects Program, July 1, 2010 to July 1, 2050, Texas State Data Center, The University of Texas at San Antonio. 2012

Tenure adjustments will not necessarily lead to more incompatibilities within the region. While disposal or leases could exacerbate noise or safety issues by placing denser residential uses in sensitive areas, adjustments could also result in less noise sensitive development or conservation/ open space that solidify a long-term use more compatible with nearby operational impacts.

Figure 7.2 illustrates existing land use patterns within the region. Given the size of the study area and the lack of specific Geographic Information System data in some counties, the JLUS planning team created a single, generalized land use layer from multiple sources. Residential, commercial, and institutional uses naturally tend to cluster in incorporated areas. These uses, especially residential and institutional can be sensitive to some military operational impacts, such as noise. Agriculture and ranching are highly dispersed through the study area. As discussed above, stakeholders have noted the sensitivity of livestock and other animal operations to noise.

Much of the study area falls into the broad category of open space, which is typically a very compatible use with military operations. Open space in this context, however, may include interspersed ranching or residential uses along with the large, undeveloped stretches prevalent in remote parts of the study area. Even though the mapping process assigned a specific use type to all land, some land, especially in the open space category may support concurrent activities. Land north of WSMR, for example, may accommodate ranching, recreation, and scattered residences, while serving as an extended safety area during periodic military testing operations. BLM-administered land that is not formally withdrawn for military use may simultaneously support public recreation, grazing, and claims for mining or energy development along with authorized military operations as specified under the Federal Land Policy and Management Act.

More careful analysis of the tenure and existing land use patterns thus reinforces two critical underlying dynamics:

- Private land and some state and federal agency land holdings can be susceptible to change; and
- Land uses are layered in many parts of the region.

Section 8 identifies where land uses and military operations may interact to create compatibility issues. The process of understanding this interaction is essential for assessing compatibility risks and determining appropriate strategies.

Community Growth Trends

Compatibility around military installations is affected as much by the physical trajectory of development as the total rate of population increase. Continued growth in areas exposed to military impacts, such as noise or safety risks can exacerbate existing land use issues, heighten the risk of future incompatibility, and require additional coordination between the military and surrounding communities. Community growth in areas close to an installation's boundaries tends to generate the highest risk of such incompatibility. Given the use of extensive airspace and co-use and call-up areas, however, the impacts generated by Fort Bliss, WSMR, and HAFB can be experienced throughout the study area.

Factors such as topography and land ownership status strongly shape a local community's ability to grow. Given the rugged terrain and large inventory of state and federal lands, growth tends to closely parallel the major interstate and highway corridors of the region. Since the number of people living in any one area necessarily correlates with the presence of sensitive land uses such as housing, population totals are an effective and simple gauge of compatibility risk in particular parts of the region. It should be noted, however, that some military activity, especially testing operations in the call-up areas of WSMR are highly sensitive even to small increases in population due to mandatory evacuation procedures.

Figure 7.3 illustrates population by census tract in 2010 with darker colors representing more populous areas. The map shows several areas with higher population totals that are in proximity to WSMR and Fort Bliss, particularly the area east of Las Cruces, in Chaparral, and those portions of El Paso south of Fort Bliss. It should be noted that since the census tracts in rural counties tend to be large, they may contain relatively high population totals but residents may be very dispersed, resulting in low population densities.

The planning team conducted interviews with key Policy and Technical Committee members and reviewed existing plans and policy documents to identify relevant growth trends within the communities of the region. Findings highlight that the primary growth area of interest in the JLUS study area begins east of the City of Las Cruces, both north and south of U.S. 70 in Doña Ana County, and then sweeps south along the I-10 corridor and east toward Chaparral.

FIGURE 7.1 | REGIONAL LAND OWNERSHIP

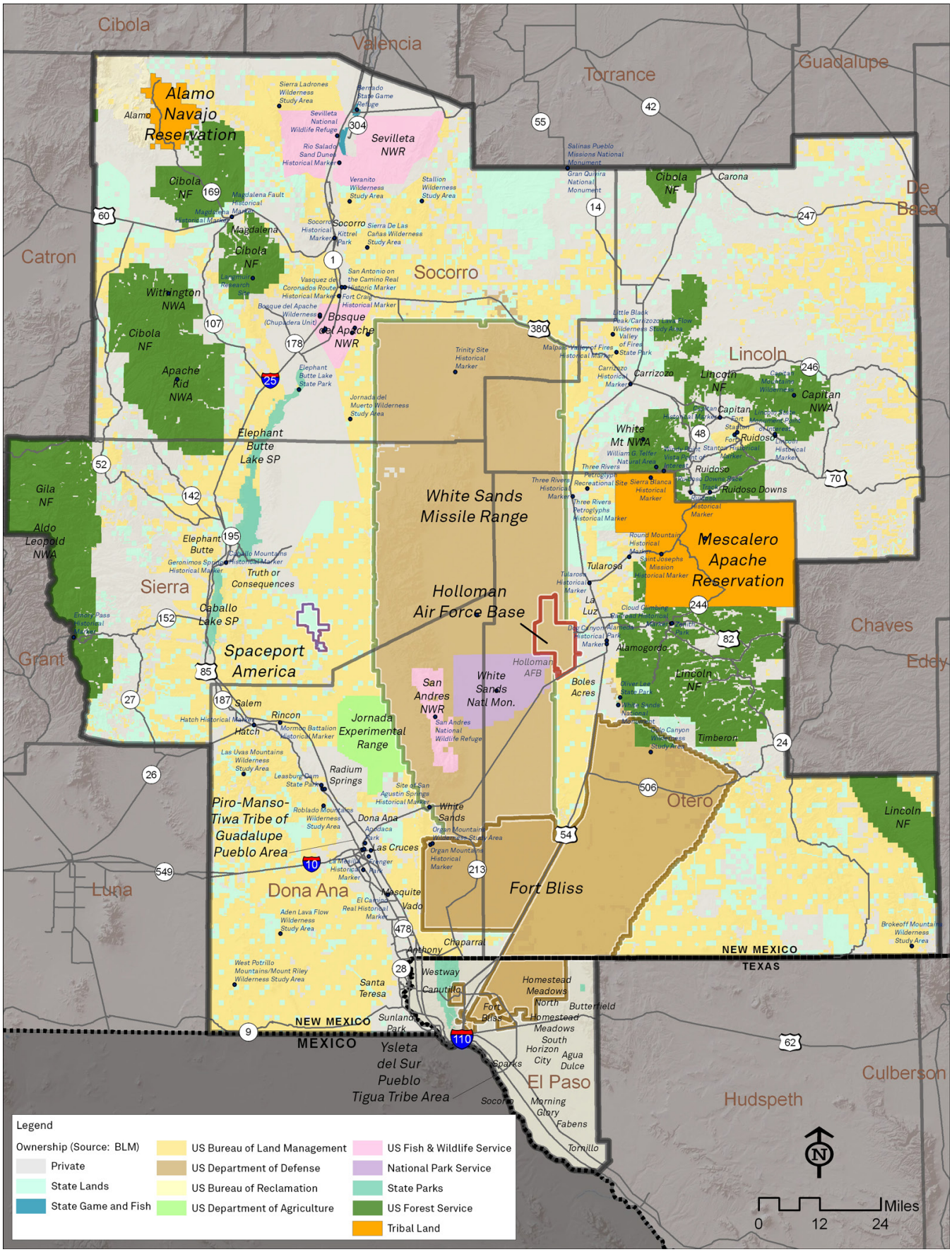


FIGURE 7.2 | REGIONAL EXISTING LAND USE

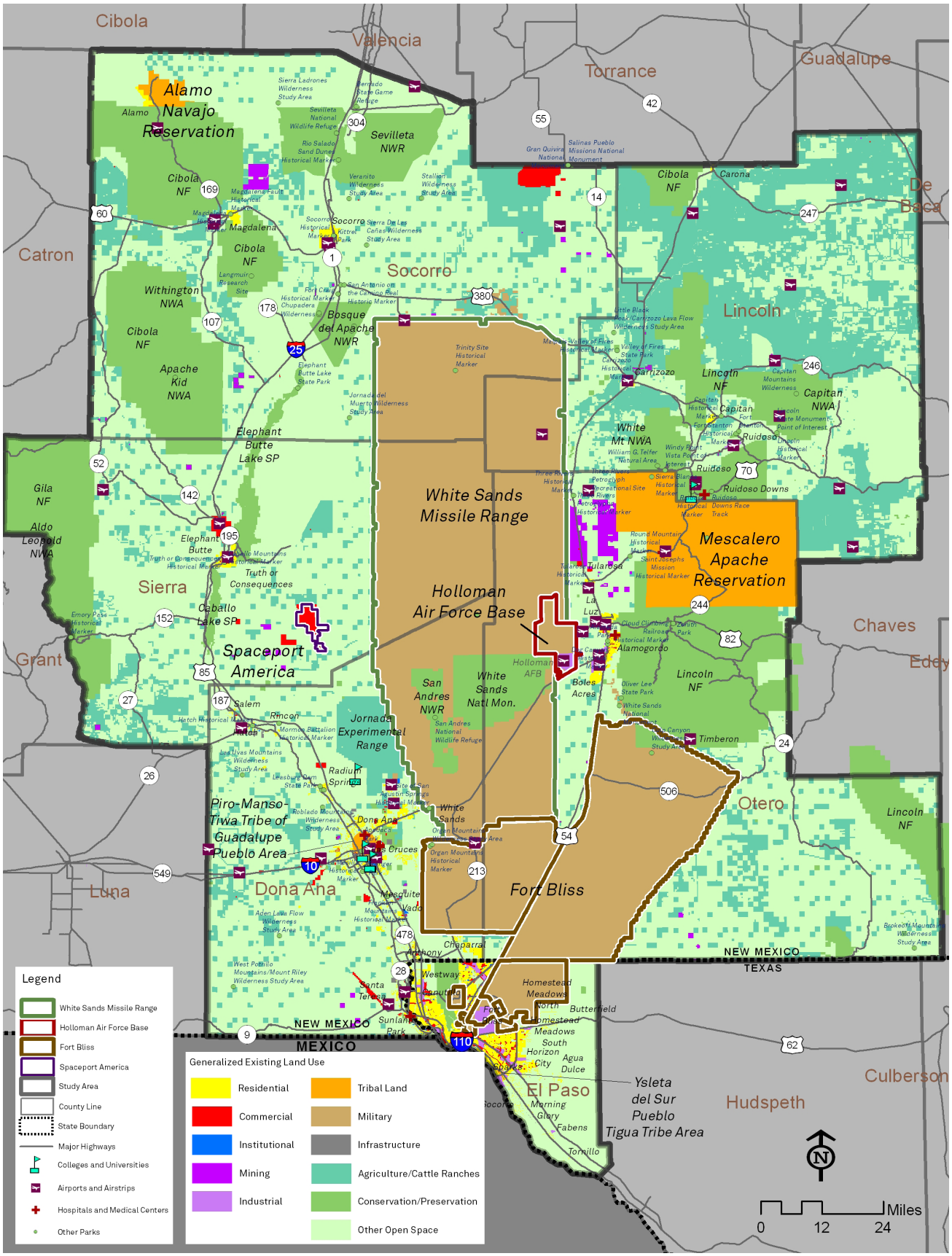
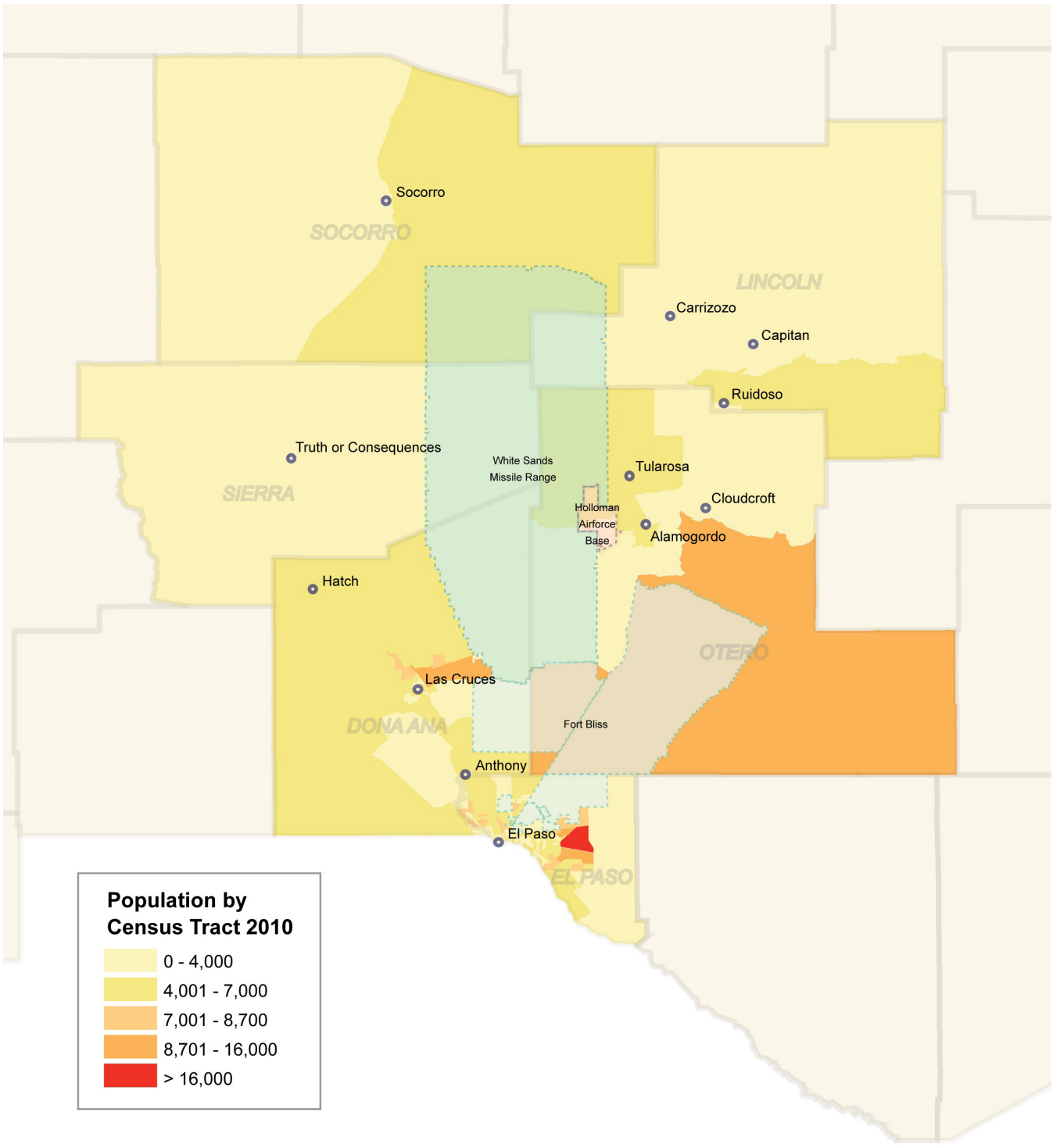


FIGURE 7.3 | REGIONAL 2010 POPULATION BY CENSUS TRACT



In Doña Ana County, growth is anticipated to continue around the U.S. 70/I-25 interchange; intensify east along U.S. 70 toward the Organ Mountains and along Weisner Road, including areas such as Dripping Springs, Talavera, Sonoma Ranch, and Metro Verde; and then emerge in pockets south toward El Paso. Much of the growth in El Paso has been in the Northwest, East, and Northeast planning areas of the city. Growth areas are concentrated south of Fort Bliss and east of Highway 375; east of Franklin Mountains State Park and south of Highway 375; and immediately east of Franklin Mountains State Park and north of Castner Range.

Growth in other parts of the region is more scattered and forms a less distinct pattern of future compatibility risk. Otero County has seen relatively limited development in recent years with the exception of the U.S. 54 corridor and the county's portion of Chaparral south of Fort Bliss. As is common throughout the study area, topography and landownership status constrains development in Alamogordo. The city has grown slightly at its northern and southern ends, but primarily focuses on development in and around its built core. Subdivision activity in Lincoln County has also been modest in recent years after very rapid growth in the early 2000s. Most development occurred in the triangle defined by Ruidoso, Hondo, and Capitan, as well as outside of Carrizozo. Regional growth has been the least pronounced in the two northern most counties of Sierra and Socorro. Second homes east of the City of Elephant Butte, particularly on the northern ridge overlooking Elephant Butte Lake have driven recent growth in Sierra County. Most of the growth in Socorro County has clustered along I-25 and Highway 304.

7.2 Regional Infrastructure

Transportation

The transportation infrastructure of the region plays a major role in organizing future development and thus setting the land use patterns that affect military-civilian compatibility. Improvements in the transportation system such as the construction of new roads or improvements to existing systems can induce private, commercial or residential investment. The team reviewed major transportation documents to identify the priorities of the region's transportation planning entities and highlighted the planned or proposed projects that could affect growth in areas near the three installations. Of particular focus are areas already noted as high growth and potentially vulnerable to exposure from military activities–the east mesa in Doña Ana County and portions of El Paso County south of Fort Bliss.

Transport 2040 - Metropolitan Transportation Plan 2010-2040

The Mesilla Valley Metropolitan Planning Organization (MPO) adopted its long-range transportation plan in 2010. The plan serves as a guide for system-wide transportation investments through the year 2040. The document identifies the metro area's current transportation needs and challenges, evaluates future growth and demands, analyzes and prioritizes short and long-term transportation projects, and sets forth strategies for implementing recommended projects and improvements. Prioritized projects include corridor improvements, new thoroughfare connections, bicycle and pedestrian improvements, and transit projects. The planned or proposed projects below affect transportation capacity in the high growth area of interest east of Las Cruces and south along the I-10 corridor to El Paso.

Projects on northeastern portion of Doña Ana County:

- Brahman Road, Road and Drainage Improvements

Projects southeastern portion of Doña Ana County:

- I-10 widening to Texas State Line
- Berino Road, Roadway reconstruction
- Swannack, Road and Drainage Improvements
- Mesquite Interchange, Ramp modifications
- Proposed new thoroughfares:Triviz (University Avenue underpass) - Connectivity to New Mexico State University
- Sonoma Ranch (U.S. 70 to Dripping Springs) - Proposed Principal Arterial
- Missouri (east end to Sonoma Ranch) - Proposed Collector
- Roadrunner Parkway (Lohman to Sonoma Ranch) - Proposed Minor Arterial
- High Mesa Road extension (Jackrabbit Interchange to Anthem) - Proposed Principal Arterial
- Outfall Channel roadway - Proposed Collector
- Alameda extension to Camino Real - Improved connectivity
- Porter Road (U.S. 70 to Dripping Springs) - Proposed Principal Arterial
- Dunn Drive (U.S. 70 to Lohman) - Proposed Minor Arterial
- Roadrunner Parkway (north end to Settlers Pass) - Proposed Minor Arterial
- Improved circulation around Las Cruces Country Club - Proposed Collector
- Rinconada (north end to Settlers Pass) - Proposed Minor Arterial
- Carver Road (NM 28 to NM 478) - Road widening to increase traffic capacity

El Paso MPO Mission 2035 Metropolitan Transportation Plan
In 2010, the El Paso MPO adopted the Mission 2035 Metropolitan Transportation Plan. The Mission 2035 plan is a regional multi-modal plan that includes roadway, transit, and safety improvements, as well as environmental and economic strategies for long-term vitality. Due to a mix of factors, including natural increases, domestic migration, and recent Fort Bliss transformation, the plan projects a 28 percent increase in population by the year 2035, with total population expected to be greater than 1,270,000. In anticipation of these trends, the Mission 2035 plan outlines transportation and economic strategies to accommodate growth, while preserving and ensuring quality of life and access to opportunity for all residents. It should be noted that the regional planning area for the El Paso MPO encompasses a portion of Doña Ana County, including the Chaparral area. The following planned or proposed projects from the Comprehensive Mobility Plan Map affect transportation capacity in the high growth area of interest near the southern boundary of Fort Bliss:

- Proposed tollway extension from Loop 375 to MLK Blvd
- Capacity improvement with toll lanes to Loop 375 from I-10 in the southeastern corner to U.S. 54
- Bus Rapid Transit from Hueco Club Park to Airway

El Paso has also previously enhanced transportation infrastructure to accommodate growth at Fort Bliss, including construction of Inner Loop/Spur 601, a 9.5 mile long route beginning at the junction of U.S. 54 at Fred Wilson and extending east to terminate at Loop 375; and construction of full service interchanges along Inner Loop/Spur 601 at Global Reach Drive and Loop 375.

Water
Southern New Mexico-El Paso has an arid climate in which surface evaporation typically exceeds precipitation, thus making water a scarce and critical resource. This built-in deficit in the annual water budget is now worsened by an ongoing drought, which is the most severe in a half century. Projections indicate that hotter and drier conditions are likely to persist, further straining supply. These climatic conditions along with quality issues such as salinity continue to challenge the region's access to long-term water supplies.

The breadth and complexity of water issues exceeds the scope of the JLUS, which focuses specifically on the interface between the military installations, the surrounding communities, and state and federal entities. The purpose of this section is to highlight water resource challenges common to these study partners. The JLUS framework can also assist in identifying other appropriate vehicles for long-term collaborative water resource management, including opportunities for regional water plans or feasibility studies for joint military/civilian water infrastructure projects.

Many entities manage and plan for water resources within the JLUS region, including four planning districts in the State of New Mexico and the Far West Texas Planning Area, encompassing El Paso County. In New Mexico, water rights must be based on a water development plan that identifies supply and conservation measures to meet reasonably projected additional water needs over a 40 year period. Similarly, the State of Texas, as overseen by the Texas Water Development Board, mandates regional water planning.

Various legal complexities affect the apportionment of water within the region. The Rio Grande Compact, for example, is an interstate agreement that allocates water to the communities of the Rio Grande basin. Under the compact, land in New Mexico is considered part of the State of Texas for purposes of surface water. The Elephant Butte Irrigation District (EBID) allocates surface water to owners of more than 90,000 acres of water-righted land in south-central New Mexico and the westernmost portions of Texas. The EBID operates and maintains the Percha, Leasburg, and Mesilla Diversion Dams, as well as the entire canal and drainage system within the district. The district's future management goals involve the delivery of water to residential, commercial, and industrial uses, as well as traditional agricultural activities.

The section below summarizes major findings from regional water planning efforts, as well as local water development plans. The results of these many studies emphasize a more balanced and sustainable approach to water resource management, including diversifying the current water supply, exploring long-term supply alternatives such as desalination and reducing demand through conservation and infrastructure efficiency measures. The region has taken several major steps toward long-term water supply diversification, including the joint Fort Bliss/El Paso desalination plant and plans for an Alamogordo municipal desalination facility. The **Appendix** contains more detailed information identified from the review of regional and local water studies.

The Lower Rio Grande Regional Water Plan 2000 – 2040

- Surface and groundwater supply varies in the Lower Rio Grande region depending on multiple factors, including irrigation practices, weather and rainfall patterns, and upstream demands, as well as the interstate compact demands on the existing water.

- Both point (municipal wastewater treatment facilities and stormwater drainage systems) and non-point (runoff) sources are a concern and can result in significant volumes of contaminants entering the water system.

- In the Mesilla Basin, the shallow groundwater is generally slightly saline. The southern portion of the Jornada del Muerto Basin has fairly low Total Dissolved Solids (TDS) levels (less than 500 mg/l) but relatively high levels of sodium, bicarbonate, and sulfate. High amounts of dissolved solids can affect the suitability of water for domestic, industrial, and agricultural uses. Water quality in the Hueco Bolson varies greatly. Most of the wells with extremely high specific conductance, an indication of high TDS levels, are in the very northern edge of the Hueco Bolson, where it is hydraulically connected with the Tularosa Basin.

- Based on analysis of supply and increases in future demand, water needs will exceed total water rights for the City of Las Cruces by 2016 under a medium growth scenario and by 2030 under the low growth scenario.

- Multiple jurisdictions, including New Mexico, Texas, and Mexico have rights to the water supply from sources within the Lower Rio Grande region. Intergovernmental coordination is critical to manage these limited water resources and pursue an integrated set of strategies, such as conservation, water recycling, desalination, aquifer storage and recovery, and storm water capture.

Tularosa Basin and Salt Basin Regional Water Plan 2000 - 2040

- In the Salt Basin, the only primary perennial surface water source is the Sacramento River. Bonito Lake supplied water to communities along a 90-mile long pipeline, including Carrizozo, Alamogordo, and HAFB until the 2012 Little Bear Fire caused flooding with silt and ash contamination to Bonito Lake and the surrounding area. Efforts to rehabilitate the lake are currently underway, but will take approximately three to five years. The loss of the lake has in turn has affected groundwater resources, as well as recreational tourism.

- The Tularosa Basin has large supplies of groundwater in its three sub-basins. The groundwater contains a significant quantity of saline water, which could provide an indefinite supply for municipal and other uses if desalinized.

- Projections anticipate increases in water demand in the Tularosa and Salt Basin region through the year 2040, primarily due to low to moderate population increases.

2003 Socorro-Sierra Regional Water Plan

- Surface inflow to the Middle Rio Grande in the water planning region include inflows from the Rio Puerco, Rio Salado, and the tributaries east and west of the Rio Grande.

- The water planning region has significant supplies of groundwater; however, the water supply is constrained in some locations by water quality issues and water rights issues.

- Constraints and restrictions on water rights, combined with the effects of multi-year droughts, will continue to deplete the water resources available from the Rio Grande and demand will not be met. Based on modeling results, available water supply is not adequate to meet all demands in dry to average years, and measures such as reduced demands, storage from wetter years, improved water supply management, or development of new resources will be required to address the region's additional needs.

Lower Pecos Valley Regional Water Plan

- The principal river basin is the Lower Pecos River. The main aquifers underlay the Fort Sumner Basin, Roswell Basin, Hondo Basin, Penasco Basin, Carlsbad Basin, and the Capitan Basin.

- The median yield of surface water is approximately 660,000 acre-foot/year (ac-ft/yr), based on historical records; however, water supply projects must consider a ± 40 percent variation in wet and dry years.

- Increases in basin yield or reductions in demand must equal approximately 12,000 ac-ft/yr to accommodate projected future growth. To meet increases in demand, the region must establish a policy to preserve aquifer storage in periods of short supply and recharge aquifer storage in periods of greater supply.

- Salinity is the only significant water quality issue in the Pecos Valley water planning region.

- The regional water plan outlines and evaluates 17 possible water alternatives to conserve water and ensure adequate resources to meet future demands, including conservation, water rights acquisition, desalination, aquifer storage and recovery, reservoirs construction, and water importation.

City of Alamogordo 40-Year Water Development Plan 2005–2045

- The City of Alamogordo historically gets about 70 percent of its water from surface sources in the Sacramento Mountains and Bonito Lake. The city also draws from a small pocket of groundwater south of Alamogordo.

- This 2005 study notes a critical gap in the water supply based on several factors, including the significant reduction in surface water availability due to drought and the fact that groundwater quality exceeds total dissolved solids guidelines and thus requires treatment or blending with better quality water. The ongoing drought and recent damage to Bonito Lake sustained during a wildfire has further exacerbated the surface water shortage.

- The plan identifies the desalination of brackish groundwater, as part of the Alamogordo Regional Water Supply Project, as the only alternative evaluated that would supply the total quantity of new water required over the 40 year horizon. The city has also been aggressive in implementing conservation measures, such as reclaiming water and reducing residential consumption.

City Of Las Cruces 40-Year Water Development Plan

- The City of Las Cruces, which sits within the Mesilla Basin along the Rio Grande, currently relies mainly on groundwater for its water supply.

- The plan anticipates rising water demand over the 40 year horizon due to a high population growth trend, recent annexations and large master-plan developments and increased commercial and industrial uses along the U.S./Mexico border. Analysis projects that city diversions will exceed the sum of existing rights and permits in approximately 15 years (2028).

- The document outlines several strategies to manage a sustainable water supply that accommodates growth, including using groundwater in the Mesilla Basin in conjunction with surface water from the Rio Grande, water rights acquisitions, and proactive conservation.

- The plan also notes that additional demand emerging over the next 40 years may have to be met through alternative sources such as desalination, deep wells, importation, and aquifer storage and recovery. Exploration of a joint desalination facility with WSMR is identified as one such opportunity.

Truth or Consequences 40-Year Water Development Plan

- The city currently sources all of its municipal drinking water groundwater wells within the Hot Springs Artesian Groundwater Basin and Lower Rio Grande Groundwater Basin.

- The city has a robust water conservation policy that addresses supply-side conservation needs through infrastructure management and maintenance. The conservation policy also includes programs targeting consumer usage, including water restrictions and tiered water rates.

- Six groundwater wells currently supply all of the city's drinking water and are sufficient to meet current demands. The proximity of the current wells to each other, however, can sometimes create pumping interference that decreases outflow potential.

- Some public concern has been raised about the effects of the Spaceport on water supplies. The Spaceport EIS analyzed water usage resulting from development and operations and determined that cumulative impacts on groundwater quantity are not likely be significant.

Lincoln County

- Lincoln County has recently accepted changes to its existing subdivision ordinance that would require all subdividers in unincorporated areas to own water rights and provide community water systems for their developments. The proposal must be reviewed by state agencies prior to final possible adoption by the county.

- The measure is designed to address critical water supply shortages resulting from the ongoing drought and wildfire and the prior spread of subdivisions that relied on individual domestic wells for each lot. The Rio Ruidoso River ran 4,500 acre feet last year compared to its norm of 6,000 acre feet.

Far West Texas Water Plan

- Other than irrigation use and a portion of City of El Paso municipal use from the Rio Grande, almost all other water comes from groundwater sources.

- Quality as well as quantity affects the available supply of water. Within Far West Texas, specific water quality challenges include the presence of arsenic and alpha radiation in some groundwater supplies, deterioration in the Bone Spring-Victorio Peak Aquifer, and general salinity.

- The plan identifies future water supply deficits for municipalities, manufacturing use, steam power electric generation, and irrigation supply in El Paso County.

- El Paso Water Utilities is the largest supplier of municipal water in Far West Texas, meeting approximately 72 percent of all municipal needs in 2010.

- The plan identifies a series of integrated strategies to meet utility demands, including: increased conservation; increased reclaimed water reuse; recharge of groundwater with treated surface water; treatment of agricultural drain water; and increased use from the Rio Grande (developed conjunctively with local groundwater).

- The City of El Paso and El Paso Water Utilities have been aggressive in implementing water conservation measures, significantly reducing per capita demand. El Paso also has nearly 40 miles of reclaimed water lines (purple pipeline) in place. The supply from the direct reuse program is anticipated to increase from 5,000 ac-ft/yr in 2000 to over 23,000 ac-ft/yr by 2060.

Military Installations

In 2011, Fort Bliss produced 68 percent of its own water and purchased 32 percent from El Paso Water Utility, receiving 2.16 billion gallons of potable water. Fort Bliss analyses have noted that the installation's main water supply, the Hueco Bolson Aquifer, is capable of providing an adequate water supply for 70 years. The aquifer, however, is a non-renewable resource and increased water demand for personnel and support functions, coupled with regional population growth can cause aquifer drawdown and the depletion of groundwater supplies. The implementation of Net Zero water initiatives can assist in reducing installation demands and re-directing more water for recharge of El Paso's aquifers, benefitting regional water resources. As described below, Fort Bliss has also cooperated with the City of El Paso on the construction and operation of a desalination plant, alleviating its most pressing near-term water supply constraints.

HAFB has historically used both groundwater and surface water from Bonito Lake in the Sacramento Mountains for its domestic water supply. Since wildfire rendered the lake unusable in 2012, the base has relied on its well fields and groundwater sources. Well fields typically have been very productive, giving the installation an adequate supply of water to meet projected needs. However, the recent collapse of HAFB's main well and the risk of a cumulative drawdown of the aquifer by increasing numbers of private wells in the region is an emerging concern. The base continues to monitor conditions in the Taylor Ranch area for the risk of a local depression resulting from development of ranchettes with shallow wells.

Groundwater sources provide all potable water for domestic and industrial uses at WSMR. The installation draws water from several well fields throughout the range. A 2009 Potable Water Resources Report indicated that with some modifications to WSMR's water supply infrastructure, wells on the Main Post and in Soledad Canyon could produce up to 717 million gallons per year of potable water, while maintaining the production yields of the wells and preventing saline water intrusion.

Though water supply constraints for the installations are not acute in the near-term, factors such as the existing drought, quality issues, the loss of Bonito Lake, and growth in specific parts of the study area highlight the need for continued and coordinated water resource planning among partners throughout the region. As with the surrounding communities, all of the installations have aggressively implemented conservation measures to reduce water demand.

Regional Water Initiatives

Kay Bailey Hutchison Desalination Plant
El Paso's water sources include groundwater from bolsons (aquifers) and surface water from the Rio Grande. Water from the Rio Grande is only available during the spring, summer and early fall months and supply declines further in years of drought. The Hueco Bolson, on the east side of the Franklin Mountains, is also the source of water for Ciudad Juárez in México and other regional communities. Historically, pumping from the bolson has outpaced the recharge rate, resulting in dropping water levels in the bolson. The amount of brackish water in the Hueco Bolson exceeds the amount of potable water by approximately 600 percent. The brackish water contains more salt than is allowed in drinking water, but significantly less than ocean water.

In recognition of the need to diversify water resources, Fort Bliss and El Paso Water Utilities collaborated on development of the Kay Bailey Hutchison Desalination Plant. The facility is the world's largest inland desalination plant with a maximum production capacity of approximately 27.5 million gallons of fresh water daily. The plant treats otherwise unusable brackish groundwater at a current rate of 3 million gallons per day. The desalination facility is a critical element in meeting the region's water demand, increasing El Paso's water production capabilities by 25 percent. A stable water supply has also played a role in supporting mission growth at Fort Bliss. Beyond diversifying the supply source, the facility also:

- Serves as an alternative water production model for other inland cities;
- Protects El Paso's and Fort Bliss' fresh groundwater supplies from brackish water intrusion by capturing the flow of brackish water toward freshwater wells;
- Removes other potential pollutants from the water – not just salt; and
- Ensures sufficient water for growth and development for 50 years and beyond.

Brackish Groundwater National Desalination Research Facility
Begun in 2004, the Tularosa Basin National Desalination Research Facility in Alamogordo is a joint project of the Federal Bureau of Reclamation and Sandia National Laboratories. The Center provides state-of-the-art facilities for desalination research studies, pilot-scale projects, and small demonstration projects. It is the only major research facility in the U.S. dedicated solely to the desalination of brackish and impaired groundwater. Research also includes renewable energy integration; development of systems for rural and Native American communities; concentrate management; and the treatment of water generated by oil and gas production.

Alamogordo Municipal Desalination Plant
The City of Alamogordo received $2.6 million in funding from the New Mexico Finance Authority to build a desalination project to address projected water shortages. The $10.5 million plant would process water from a well field proposed on public land about 10 miles north of Tularosa. The project includes a temporary desalination site at the city's water treatment plant in La Luz and plans for a permanent facility on Lavelle Road, near the National Desalination Research Facility.

Prior to the receipt of funding, the BLM and the Bureau of Reclamation prepared an EIS for the proposed Alamogordo Regional Water Supply Project and issued a Record of Decision in 2012 approving the four components of the Proposed Action: (1) constructing and operating up to 10 brackish groundwater wells at Snake Tank Road; (2) installing a water transmission line to Alamogordo; (3) constructing a desalination facility in Alamogordo to treat 4,000 ac-ft/yr (3,200 ac-ft/yr potable) of water; and (4) constructing a booster pump station near the desalination plant to deliver the water into the city's municipal system.

7.3 Regional, Cultural and Recreational Resources

The SNM-EP region abounds with natural, recreational and cultural resources. The landscapes, wildlife habitats, and natural ecologies, as well as a rich history and cultural identity, make it one of the most unique settings in the western United States. With a widely diverse topography, ranging from less than 3,000 feet above sea level in the region's river valleys to almost 12,000 feet above sea level, ecologies span arid lowland deserts, mountainous terrains, and high elevation sub-alpine forests. Significant portions of the land area are federally or state owned, which affords the region a high level of land and natural resource protection.

Natural Resources
The extreme geographic and topographic range within the region yields an unmatched geologic, ecological, biological diversity (see **Figure 7.4**). This variety enables private, state, and federal land holders to capitalize on access to both surface rights and sub-surface mineral and mining rights. Natural resources play a critical role in the region's economy and support an array of activities including:

- Agriculture;
- Alternative and renewable energy, including wind, solar, and geothermal;
- Livestock grazing;

- Oil and gas;
- Mineral mining, including sand, gravel, stone, pumice, pumicite, cinders, and clay; and
- Timber farming.

While the BLM and NMSLO own and manage millions of acres of lands within the study area for productive use, significant areas of environmentally sensitive lands are preserved. The region is home to 25 Wilderness Study Areas (WSAs) and 28 Areas of Critical Environmental Concern (ACECs), as well as national forests and other protected lands. These designations protect the habitats of endangered and rare plant and animal species unique to the region.

The major resources located within the JLUS study area include:

- Aguirre Springs National Recreation Area
- Aldo Leopold Wilderness
- Bosque del Apache National Wildlife Refuge
- Caballo Lake State Park
- Capitan Mountains Wilderness Area
- Chupadera Wilderness
- Cibola National Forest
- Dripping Springs Natural Area
- Elephant Butte Reservoir State Park
- Franklin Mountains State Park
- Gila National Forest
- Lincoln National Forest
- Little San Pascual Wilderness
- Prehistoric Trackways National Monument
- Sevilleta National Wildlife Refuge
- Sitting Bull Falls Recreation Area
- Three Rivers Petroglyph Site
- Trestle Recreation Area
- White Mountain Wilderness Area
- White Sands National Monument

According to the BLM TriCounty Plan, Doña Ana County, Sierra, and Otero Counties support 78 special status animal species and 44 state-listed plant species or habitats, along with five federally listed threatened and endangered birds, four plant species, and one frog.

Mountains and Rivers

The SNM-EP region is textured with an intricate system of mountain ranges, mesas, river basins, and desert lowlands. Major mountain ranges within the region include the:

- Caballo Mountains
- Capitan Mountains
- Guadalupe Mountains
- Franklin Mountains
- Mimbres Mountains
- Organ Mountains
- Oscura Mountains
- Sacramento Mountains
- San Andres Mountains
- San Mateo Mountains
- Magdalena Mountains
- Sierra Blanca Mountains (also known as the White Mountains)

The region is also hatched with rivers and watershed systems. Major river systems include the Rio Grande and the Pecos River and major surface water resources include Elephant Butte, Caballo reservoir, Tularosa Creek, and Percha Creek. Surface water sources and associated groundwater basins and aquifers supply the farms, communities, and military installations within the region.

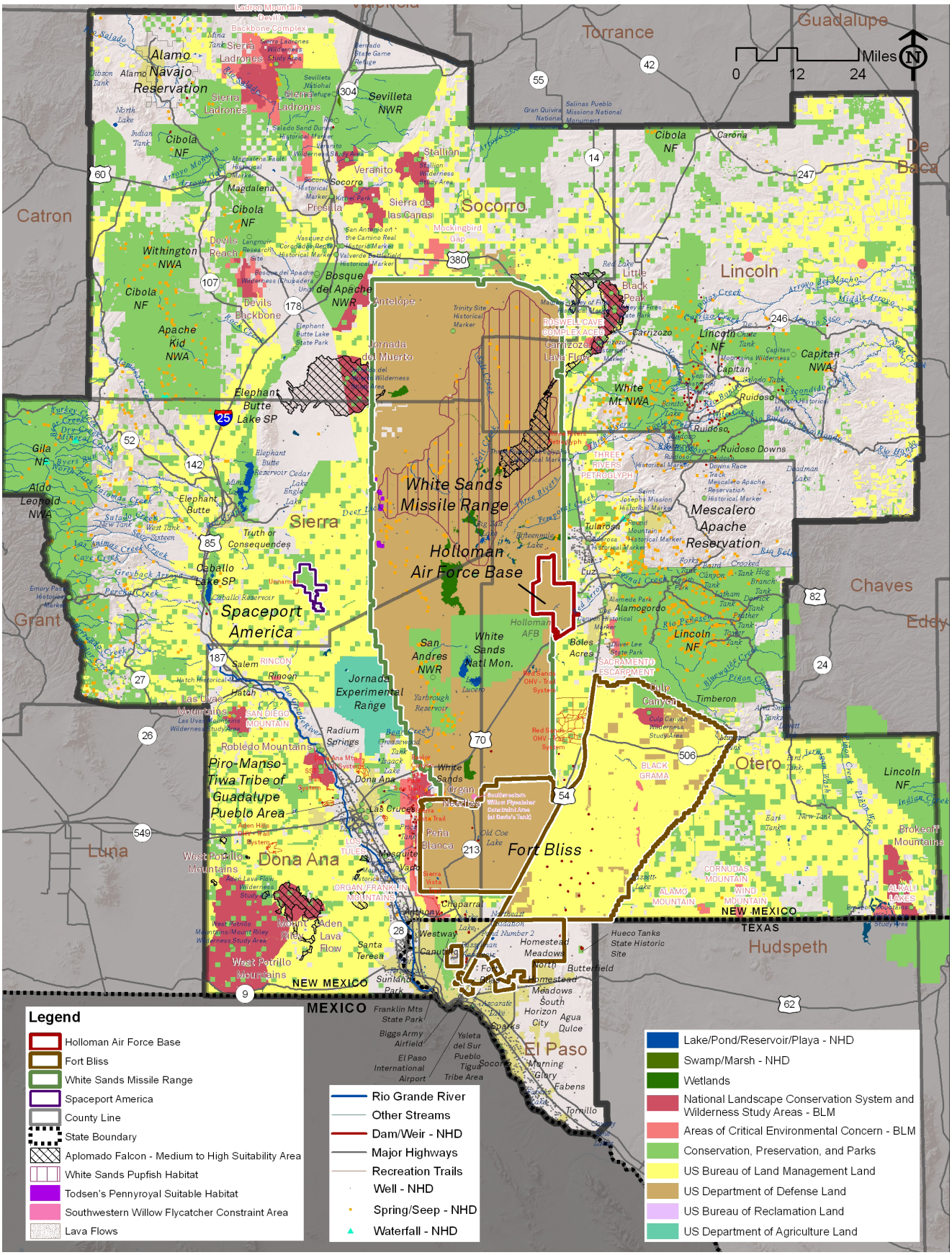
Cultural Resources

The area's cultural resources include prehistoric and historic archaeological sites, traditional cultural properties, sacred sites, buildings, structures, artifacts, cultural landscapes, and historic districts. Cultural resources represent evidence of the knowledge, technologies, beliefs, art, morals, laws, and customs particular to the people who have resided in an area.

Human groups have occupied the region for at least the last 12,000 years (see: Fort Bliss Army Growth and Force Structure Realignment Environmental Impact Statement, 2010). The earliest conclusively documented evidence of prehistoric human occupation occurs during the Paleo-Indian period (10,000 B. C. – 6,000 B.C.). Paleo-Indian settlements were traditionally small, highly mobile bands with a subsistence economy centered on hunting large game animals such as mammoth and bison. By about 6,000 B.C., woodlands had been displaced by Chihuahuan desert scrub communities and large game animals were extinct. The Archaic period began at this time and continued until about A.D. 200. The archaeological evidence indicates that local groups during this period were seasonally mobile, relying on a broad spectrum of animal and plant foods.

The Formative period (A. D. 200 – 1450) follows the long Archaic period and is characterized by several important changes in settlement adaptations. These include a relatively rapid succession of changes in architectural form from small huts to formal pueblos, settlement size increases, and an increased reliance on cultivated foods that culminated in the pueblo occupations between A.D. 1250/1300 and 1450. The historic period began with the arrival of the Spanish in A.D. 1581.

FIGURE 7.4 | REGIONAL ENVIRONMENTAL RESOURCES



As a result of this rich history of interaction between the people and the landscape, the region has an abundance of archaeological and historical resources. Based on assumed densities of documented sites from previous surveys, the BLM estimates that there are more than 40,000 archaeological and historical sites in Otero and Sierra Counties (TriCounty Draft Resource Management Plan/Environmental Impact Statement, BLM, 2013). The New Mexico Cultural Resource Information System includes information about 3,838 archaeological and historical sites recorded in Doña Ana County. Average site density suggests that there are approximately 20,000 to 25,000 archaeological sites in Doña Ana County.

Fort Bliss alone has over 19,000 archaeology sites on its lands (Integrated Natural Resources Management Plan, Fort Bliss, 2001). The installation has executed a Programmatic Agreement (PA) with the Texas and New Mexico State Historic Preservation Offices that outlines a process for the treatment and management of properties consistent with the National Historic Preservation Act (NHPA). The Fort Bliss PA enabled personnel to use predictive modeling to identify areas of McGregor Range likely to have archaeological sites and conduct an actual survey on a smaller portion of the range. The 30 percent sample and subsequent mitigation has been completed and those maneuver areas are open to training in compliance with Section 106 of the NHPA.

Native American culture strongly influences the cultural landscape of the region. Southern New Mexico-El Paso is currently home to multiple Native American tribes, including the Mescalero Apache Tribe, Ysleta del Sur Pueblo, Piro-Manso-Tiwa Tribe of Guadalupe Pueblo, and the Alamo Band Chapter of the Navajo Nation. The area has a number of resources related to Native American culture, which include resources associated with the cultural practices and beliefs of a living community. Sacred sites are resources of traditional religious importance. For example, Sierra Blanca peak, one of the most visible physical features of the study area, is sacred for the Mescalero Apache Tribe.

Otero Mesa National Monument Designation

At over 1.2 million acres in size, the Otero Mesa is the largest expanse of Chihuahuan Desert grassland left on public lands in the U.S. The area, which is southeast of Alamogordo within the JLUS region, is administered by the BLM. In 2002, the Coalition for Otero Mesa formed and launched a campaign to secure permanent protection for the grassland through designation as a national monument. The designation is intended to maintain status quo in use of the land and prohibit such threats as oil and gas drilling and mining.

Mexican spotted owl

The Otero Mesa currently supports an array of natural, cultural, defense, and economic interests, including sites sacred to the Mescalero Apache Tribe; diverse species of native wildlife; the region's largest untapped water source, the Salt Basin Aquifer; historic deeds, including grazing; and existing mining claims related to resources such as uranium, lithium, and eudialyte, a red mineral containing zirconium and rare earths. The mesa is also critical for surface danger zone buffers for missile firing and the Air Force use of Centennial Bombing Range. It also offers on-road and dismounted (on foot) training opportunities.

Some local and state stakeholders have expressed concern that a federal designation would unduly restrict use of the land and threaten grazing access. Legislation introduced in the U.S. House of Representatives would require the President of the United States to secure state consent before declaring a national monument. While the administration has not yet invoked its authority to establish monuments under the Antiquities Act of 1906 in Otero Mesa, a BLM memorandum has indicated that protection of the Mesa is a high priority.

Recreational Resources

The convergence of such dynamic and compelling natural and cultural features creates a diverse array of recreational opportunities within the region. The area's landscape, ranging from sub-alpine peaks to river valleys and scrublands, hosts mountain biking, off-roading, hiking, boating, wildlife watching, big and small game hunting, fishing, camping, mountaineering, scenic driving and the viewing of historic and prehistoric sites. The vast open spaces and sparsely populated areas in many parts of the region also offer long, uninterrupted vistas and unparalleled dark sky stargazing.

The SNM-EP communities have specifically cited the importance of tourism and outdoor recreation as a major economic driver. Activities such as hunting, bird-watching, camping, and lake-based recreation contribute significantly to the local economy.

08 INITIAL COMPATIBILITY ANALYSIS

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

- Communities experience higher than normal levels of impacts from military activities, such as noise or safety risks, which can then affect quality of life or uses of land; or

- Certain types of development limit the ability of the military to perform its missions or cause changes in training or testing operations that reduce mission effectiveness.

Drawing from stakeholder interviews, the review of previously conducted studies and plans, and additional technical analysis, this section highlights areas of the SNM-EP region in which current and foreseeable military operations and surrounding community activities may overlap and create compatibility challenges. The areas of overlap are organized around a series of known or anticipated compatibility issues. **Section 9** takes the next step of translating these interactions into a set of more general compatibility factors that describe the types of activities, land uses or project-related impacts that could overlap within the region. These factors are intended to form the basis of a decision-making tool for stakeholders.

Compatibility issues include:

- Air Quality
- Airspace Use
- Aviation/Testing Safety
- Community Growth and Development
- GPS Jamming and Frequency Spectrum Interference
- Light Pollution
- Noise – Aviation
- Noise – Range
- Public Trespass/Access
- Transportation
- Water
- Wildfires

Air Quality

Military convoys traveling on local dirt roadways and maneuver training activities on the ranges can generate fugitive dust. Compatibility issues arise when the dust affects the surrounding communities by diminishing air quality and reducing visibility. Air quality can also be affected by smoke from controlled burns.

Specific Areas of Sensitivity:

Chaparral and U.S. 54:

- Maneuvers on the Doña Ana Range training areas can create dust that affects the community Chaparral and portions of the U.S. 54 corridor.

Airspace Use

Competition exists between HAFB and WSMR (and to a lesser extent, Fort Bliss) to schedule restricted airspace. A partnership between HAFB, WSMR, and Fort Bliss, called the TRIAD, is examining options for maximizing airspace capacity for the three installations and, indirectly, for commercial and general aviation traffic.

Primary concerns regarding airspace revolve around access to and through military controlled airspace. Restricted airspace above and adjacent to the three military installations forms a large, contiguous block (comprised of R-5103, R-5107, and R-5111) that commercial traffic must circumnavigate, increasing travel time and cost. To alleviate issues, special corridors have been established for commercial aircraft (e.g. following U.S. 54 underneath restricted airspace) and in two high altitude corridors through R-5107 (e.g. R-5107 F/G). As with road access and closures, emergency air operations such as lifeguard flights (carrying patients from Alamogordo to Socorro) take precedence over scheduled test or training operations.

Currently, restricted airspace for the three installations is managed as a military radar unit (MRU). The MRU deactivates and releases control of WSMR's restricted airspace back to the FAA's Albuquerque Air Route Traffic Control Center (ARTCC) as specified, on weekends and weekdays between midnight and 6 AM when not needed for military uses. At these times, the FAA can route civilian operations through the restricted airspace. There are times when specific blocks of restricted airspace are not scheduled by military users; however, procedures only allow civilian traffic to transit restricted airspace when it is not active and under control of the ARTCC.

Due to lead times involved in releasing airspace back to the FAA, it is impractical for the Albuquerque ARTCC to accept airspace for a period shorter than two hours. Consequently, it is not feasible to utilize ad hoc or short blocks of time under the current management system. Another concern is that increased military use for test, training, and commercial space operations will diminish availability for any civilian transit. One concept under consideration would replace the MRU with a certified air traffic control (ATC) facility. In this capacity, the ATC could allow short-notice transit through restricted airspace by non-military operators.

Additionally, the mix of military and civilian traffic in uncontrolled airspace is likely to intensify. Use of UAVs/RPAs is increasing in both the military and commercial realms. HAFB flies RPAs in and out of its airfield, using WSMR restricted airspace. Fort Bliss flies UAVs mostly over the Doña Ana Range. The Army recently defined an Alert Area to the east of the Fort Bliss cantonment areas in El Paso. This designation does not trigger formal rule-making with the FAA, but the area is charted, alerting pilots of the high level of military traffic that may be encountered. Fort Bliss is considering this status for other areas with elevated helicopter use.

New Mexico State University's Physical Science Lab also operates the Unmanned Aircraft Systems Flight Test Center (UAS FTC). The facility has a Certificate of Authorization (CoA) from the FAA to use 15,000 square miles of national airspace in southeastern New Mexico for its operations. Several military and non-military airfields and airports can serve as landing and take-off sites within the operational area. The facility, which opened in 2008, is the first FAA-approved non-military UAS test center in the nation.

As the operating range of military aircraft and weapon systems increases, the airspace and land needed to support realistic and effective testing and training is also increasing. Even though the region has extensive restricted airspace, it is possible that future proposals will seek to expand capabilities. The idea of special corridors or intermittent use airspace could provide for expanded operating arenas. No specific proposals are currently identified.

Along with general airspace issues, several users create specific demands on regional airspace. The BLM periodically uses airspace to perform its landscape restoration and fire suppression responsibilities. The restoration projects, which include the aerial spraying of herbicides, often require a very specific window of operation due to seasonal or weather-related conditions. The use of airspace by higher priority military operations can reduce the availability of airspace for BLM activities.

Additionally, the Forest Service has noted airspace management issues, particularly when performing fire suppression activities from the Alamogordo Interagency Dispatch Center. Though the USFS coordinates with HAFB through the interagency facility, the turnover of military personnel can pose a challenge for continuity in communication.

The Alamogordo/White Sands Regional Airport did not note current issues related to airspace congestion from operations. This regional airport has 78 aircraft, including six gliders, two small jets, and one helicopter. The airport and local community are actively pursuing new businesses that would increase flights, including commercial service that could bring in one to two daily regional commuter jet flights. The FAA has given approval for a runway extension to support possible commercial operations. Any such extension and eventual commercial activity would require coordination with HAFB on aircraft approaches. Army helicopters may also use this airport more frequently in the future.

Commercial space operations in WSMR's restricted airspace are very compatible from a military mission perspective, but increased activity at Spaceport America could affect WSMR's scheduling of test, training, and commercial users, extending hours of operation or redistributing operations into other restricted or controlled airspace that previously had low use.

Specific Areas of Sensitivity:

Restricted Airspace (R-5103, R-5107, and R-5111):

- Increases in the scheduled use of restricted airspace for military operations could further reduce the ability of commercial and general aviation air traffic to pass through military controlled airspace.

- An increase in the level and mix of UAV/RPA and military aircraft using restricted airspace above the commercial VFR corridor along U.S. 54 may warrant designation of special corridors that allow flexibility for the aircraft to cross between Doña Ana Range and the DAGIR and DMPRC on McGregor Range.

FAA-Approved Non-DoD Airspace:

- The increased use of regional airspace for military and non-military operations and UAVs can pose challenges for scheduling.

Spaceport America:

- Commercial space operations in WSMR's restricted airspace are compatible with known military missions, but increased activity could affect WSMR's scheduling of test, training, and commercial users, thereby extending the hours of operation or redistributing operations into other restricted or controlled airspace that previously had low use.

Alamogordo/White Sands Regional Airport/ Alamogordo Interagency Dispatch Center:

- The turnover of military personnel can pose a challenge for continuity in the coordination of flights related to fire suppression activities.

Apache Point Observatory:

- Aircraft overflights require special precautions during the observatory's APOLLO operations. Apache Point coordinates with the FAA and military to issue a Notice to Airmen (NOTAM) regarding the potential hazard.

Aviation/Testing Safety

Challenges to aviation and testing safety include the development of physical infrastructure in areas that accommodate hazardous testing activities conducted by WSMR and low-level flight operations associated with HAFB. The safety envelopes for WSMR encompass a 4,459,850-acre area that falls to the north and west of the main range within Doña Ana, Otero, Lincoln, Sierra, Socorro, and Torrance Counties. This land underlies portions of WSMR restricted airspace and includes the call-up areas. WSMR has contracts with certain landowners to evacuate when a test may cause unsafe conditions and it is this flexibility that makes these extension areas critical for maintaining WSMR mission capabilities.

One of the emerging compatibility issues is the region's potential for solar and wind energy production. The most prominent proposal is the SunZia project, which would include two new, single-circuit 500 kV transmission lines, traveling through Lincoln, Socorro, and Sierra Counties. The routes currently under review as part of the EIS process include those that cross through WSMR's Northern call-up area and portions of WSMR's restricted airspace (see **Section 4.7** for additional detail).

Compatibility issues relate to the higher risk of potential damage to the transmission lines should a launched missile malfunction and need to be remotely destroyed within the fallout zone. The fallout zone is an estimated area where debris could land based on factors such as the height and location of the missile at the point of detonation.

The structures also pose a risk to aircraft due to physical intrusion into low-level flight corridors. The FAA evaluates the obstruction hazard of any proposed structure that is more than 200 feet AGL. While this process safeguards against potential hazards in excess of 200 feet, structures that fall below that threshold are not subject to FAA review and thus may not be charted or properly lit or marked. Some counties in the JLUS study area, including Otero, Sierra, and Socorro lack a permitting process that could assist in identifying where such structures are installed. The proliferation of un-reviewed structures can pose a collision risk, particularly in low-level military training routes with a minimum floor of 100 feet AGL.

Aviation-related hazards also exist in proximity to military airfields. The DoD establishes Clear Zones (CZs) and Accident Potential Zones (APZs) around military airfields based on analysis of military aircraft accident history and a determination of where an accident is likely to take place and the physical extent of the impact area resulting from any single accident.

The CZs, located at the immediate end of the runways, have an accident potential that is high enough to warrant the prohibition of all structures. APZ I is less critical than the CZ, but still possesses a significant potential for accidents that is compatible only with very limited development. APZ II, which extends beyond APZ I, has the lowest accident risk of the three zones, but guidance still calls for land uses that do not result in higher populations. As shown in **Figure 5.3**, the CZs are contained within HAFB boundaries. Portions of APZ I and APZ II extend to the east, west, and south of the base.

Specific Areas of Sensitivity:

Northern Fix and Western Call-up Areas:

- Development and population increases in the call-up areas can threaten the testing and training mission by making existing evacuation agreements with private landowners more cumbersome.

- The call-up areas are highly sensitive to the development of physical infrastructure for resource development (wind energy) and energy distribution (transmission lines). Risks include the potential for infrastructure damage in the event of missile malfunction, the intrusion of tall structures into low-level flight corridors, and frequency spectrum interference.

Military Training Routes/Low-Level Flight Corridors:

- Energy and telecommunications infrastructure poses a risk to aircraft due to physical intrusion into low-level flight corridors.

HAFB AICUZ:

- Portions of APZ I and APZ II extend beyond HAFB boundaries to the east, west and south, indicating areas of the community in which compatibility guidance calls for uses that do not concentrate people due to the risk of an aircraft accident.

Community Growth and Development

Community growth and development reflect the strategic interests of the counties, municipalities, and unincorporated areas of the region. These interests revolve primarily around the physical expansion of communities, including increased residential and commercial activity; the provision of infrastructure and public services to support continued growth and enhance quality of life; and specific economic development initiatives intended to diversify the local economy, create jobs, and increase tax revenue.

Among the economic development initiatives in the region:

- Tourism-based activities such as: hunting, bird-watching, camping, hiking, hot spring- and lake-based recreation, and Spaceport America;

- Renewable energy development, including wind and solar energy production and distribution;

- Agriculture and ranching;

- STEM-based (science, technology, engineering and math) research partnerships that include the local communities; military installations and other federal agencies; universities, such as New Mexico State University, New Mexico Tech, and The University of Texas at El Paso; and the private sector; and

- Recruitment of new companies along with the growth of local businesses.

The communities also continue to explore opportunities to develop a more connected and economically integrated region through initiatives such as a potential commuter rail service linking major cities. As will be explored more fully in the economic impact assessment element of the JLUS, the communities also participate actively in the economic opportunities directly associated with the military installations, serving as home to military and civilian personnel and contractors and attracting defense-related industries. While these initiatives are growth-oriented, many of the communities, particularly in the Sacramento Mountains and Truth or Consequences/Elephant Butte area also seek to preserve the rural character that appeals to the region's tourists, retirees, and second homeowners.

The majority of land in the region is owned and managed by federal agencies, including the Department of the Interior (BLM) and the Department of Agriculture (USFS). The percentage of federal land in each county varies from a high of 83 percent in Otero County to a low of just over 19 percent in El Paso County (Doña Ana - 76.9%; Lincoln - 42.7%; Otero - 83.7%; Sierra - 53.8%; Socorro - 60.6%; El Paso - 19.3%)

The substantial federal presence further accentuates the importance of local growth initiatives as a means to fund critical local services and maintain fiscal health. All six of the counties in the SNM-EP region are recipients of payment in lieu of taxes (PILT), which provides funding to counties and other local governments to offset losses in tax revenues due to large areas of tax-exempt federal land within their jurisdictions.

Much like local government, the federal agencies in the region manage lands for the public benefit. Their mandates result in overlapping uses from energy production, forestry, cattle grazing, and extractive uses (mining) to landscape and wildlife management, recreation, and nature viewing. Similarly, New Mexico and Texas manage lands for multiple uses with revenue generation as a primary goal.

Compatibility issues arise when military operations interact with this mosaic of growth and development interests, generating nuisance or safety-related impacts. The purpose of the JLUS is to help balance these vital community growth opportunities and private property rights with the continued viability and effectiveness of the military mission.

Specific Areas of Sensitivity:

Community Growth - East Mesa/Chaparral/El Paso:

- In Doña Ana County, growth is anticipated to continue east of the City of Las Cruces and along the I-10 corridor and east toward Chaparral. These areas are exposed to aviation noise (east mesa) and noise from Fort Bliss range operations (Chaparral).

- More than 11,000 acres of state trust land are in or near Las Cruces and the NMSLO is the largest land holder with Planning and Development leases in the area east of the city. The NMSLO also holds approximately 2,000 acres around Chaparral. The convergence of strong growth prospects and compatibility concerns highlights the importance of long-term, coordinated planning in these critical areas.

- Continued residential growth south of Fort Bliss near the Loop 375/Montana Avenue area places development in proximity military operations.

Energy Resource Development - Northern Fix and Western Call-up Areas:

- Wind energy infrastructure and transmission lines can interfere with missile testing and low-level flight operations.

Tourism Development – Spaceport America:

- The safety zones for vehicle launches at Spaceport America are based on the number of people in the area and the type and reliability of the vehicle used. The safety zones are designed to minimize the number of people at risk in the event of failure and maintain the safety of the vehicle.

- Increased development in adjacent areas could significantly jeopardize launch operations and heighten safety impacts. The need for limited development with safety zones makes the Spaceport a highly compatible use with nearby military operations.

Tourism Development – Special Areas:

- Recreational, cultural, and natural resources that place a value on relative solitude, including state and federal parks and monuments, wildlife refuges, national forest recreation sites, and Wilderness Areas can be exposed to noise from military operations, particularly aircraft overflights. These resources are a critical part of the local tourism base.

- Public recreational activity in some areas, particularly the co-use area of McGregor Range or WSMR's call-up areas create the potential for inadvertent trespass and safety risks during training and testing operations.

GPS Jamming and Frequency Spectrum Interference

Issues of frequency spectrum use and deconfliction are a growing regional concern. The last few decades have seen a dramatic rise in commercial and private wireless communication and commercial broadcasting. Similarly, the modern battlefield is dependent on linked electronic devices and systems that communicate wirelessly over varying distances.

Radio spectrum is a finite resource and only certain portions of it are useable. Both federal and non-federal agencies and the commercial sector compete for this finite spectrum. Due to competition, the spectrum is shared between the government and non-government sectors. There are two groups that manage spectrum allocation–the Federal Communications Commission (FCC) and National Telecommunications and Information Administration (NTIA). NTIA manages allocations among the DoD users. To maximize use, NTIA may allocate a frequency to several uses/users, which can result in conflicts.

WSMR has a regional DoD Frequency Manager who carefully tracks and deconflicts spectrum use for regional military users through the Integrated Frequency Deconfliction System (IFDS). IFDS, managed by the Navy, has become the de facto standard among DoD facilities. IFDS is not a DoD program and is a fee service; therefore, its use cannot be mandated. One frequency can be assigned to multiple users, resulting in conflicts between DoD, FAA, NASA, and other federal agencies, thus requiring real-time coordination. IFDS allows other military users to filter by area of use to manage conflicts. The advantage of using a centralized system is that other users can see what is scheduled and by whom, facilitating coordination.

The following are regional frequency issues:

- Frequency use in Mexico is not managed or coordinated with the U.S. allocations. NTIA has established a border zone within 90 miles of the Mexico border with a set of frequencies that cannot be used.

- Some frequencies have capacity; but others, especially in the Very High Frequency (VHF) range are saturated. The main area of encroachment is 225-400MHz band. This band is divided into 25 KHz channels and some wider channels that are in high demand. Some channels in this band are not available due to the 90-mile border restriction.

- In general, military uses stay out of the public/commercial spectrum domain; however, some commercial users are moving into the spectrum bands used by the military. Also, some bands are shared by government and non-government sectors. Consumer demand (mostly for the video gaming market) is driving a trend to "sell off" government bandwidth, depleting what is available for the multiple and complex military needs in the region. Commercial entities want core federal bands for fixed and mobile communications, mostly in the lower frequency ranges that have narrow bandwidths but longer range. Since it is desired by commercial services providers, the 450MHz and 4GHz bands are being sold off.

- WSMR has several radar and instrumentation sites both inside and outside its boundaries with some along the west slopes of the Sacramento Mountains. These provide critical information for air traffic control and the tracking of tests. New frequency uses (e.g. communication towers) can interfere with this critical infrastructure. The FCC has given part of C-band range to Part-15 devices (low power, in-home devices). To resolve some of these conflicts, WSMR is specifically looking to move their tracking radars to X-band, which may also provide better resolution of even smaller objects.

- GPS jamming tests on HAFB and WSMR can affect commercial and private GPS devices in the local airspace (such testing is coordinated with the FAA and NOTAMs are issued to pilots about any hazards), and on some stretches along U.S. 70. Most jamming is done at night and the primary concern for the effects of this testing is on non-participating flight operations in the vicinity.

- Although the military does have a common integrated platform for managing its spectrum use, the region lacks a single platform for viewing, assigning, and deconflicting military, other federal, commercial, and private spectrum uses. This function, performed by the regional DoD frequency coordinator, is becoming more complex and may demand a more efficient and transparent management system as competition increases and interference erodes reliability for all users.

- Some renewable energy infrastructure can also interfere with communication systems, including radar, navigation aids, and infrared instruments. Wind turbines create low frequency radio signals that look like a typical target and its spinning blades can mimic a storm cell on weather radars. Turbines can also create a "cloud" on the radar screen so that anything flying in or behind the wind farm is not visible from the radar source. This interference can affect the ability of military radar to guide aircraft safely through regional airspace.

Specific Areas of Sensitivity:

East Mesa:
- Increasing residential development could affect spectrum clarity for NASA WSTF.

Highway 70 Area:
- GPS jamming tests on HAFB and WSMR can affect commercial and private GPS devices in the local airspace and along some stretches of U.S. 70.

Spaceport America:
- Radio frequency spectrum uses could also increase as development of Spaceport America accelerates. Spaceport seeks to avoid frequencies that conflict with WSMR. However, the tenant/customers are commercial ventures that seek radio frequency access and Wi-Fi.

Northern Fix and Western Call-up Areas:
- Resource development (wind turbines) can interfere with communication systems, including radar, navigation aids, and infrared instruments.

WSMR Radar and Instrumentation Sites:
- New frequency uses (e.g. communication towers) can interfere with critical radar and instrumentation sites.

Light Pollution

Light pollution is the effect of stray or excessive light from artificial lighting sources, such as building exteriors, advertising, streetlights, or outdoor facilities or venues. Pollution occurs when light travels beyond its intended target of illumination into otherwise darkened areas. The adverse impacts of light pollution include glare from overly bright sources or night sky brightness in which upward-bound light creates a background glow.

Compatibility issues can arise when light pollution interferes with the use of night vision training devices (NVD) during military training operations. Night vision goggles, other types of NVD worn by personnel, or NVD systems integral to aircraft and vehicles capture and amplify any illumination in the surrounding landscape, displaying an extreme sensitivity to a broad spectrum of light sources. Exposure to stray light can cause the vision screen to white-out, temporarily robbing the wearer of vision.

In addition to training, other facilities such as the Ground-Based Electro-Optical Deep Space Surveillance (GEODSS) facility at the northern end of WSMR are also highly sensitive to stray light exposure.

Light pollution can also affect the region's observatories. Apache Point in Sunspot, New Mexico has noted compatibility issues related to ramp lights at HAFB. The sky brightness from base lighting reduces the star magnitudes by nearly 1 magnitude (factor of 10) versus other parts of the sky, limiting the depth of space into which the observatory can see and the types of objects on which data can be collected. Though less of an issue, the growth of El Paso combined with Fort Bliss contributes to an expanding sky glow visible at the observatory.

Light pollution can be minimized by the use of dark sky friendly lighting, such as fully shielded fixtures that direct light downward. Local jurisdictions can promote more sensitive outdoor lighting practices through adoption of dark sky ordinances. The City of Alamogordo, for example, has adopted an ordinance that sets forth restrictions and guidelines on the timing, orientation, and shielding of outdoor lights on public and private property as a means to protect aviation and observatories. The military installations are also increasingly exploring more sensitive light strategies as part of mandated energy conservation measures.

Specific Areas of Sensitivity:

Regional Observatories:
- Light pollution from both civilian and military sources can reduce visibility in the surrounding area and limit astronomical observation.

- Apache Point in Sunspot, New Mexico has specifically noted compatibility issues related to ramp lights at HAFB.

Northern WSMR:

- The Ground-Based Electro-Optical Deep Space Surveillance (GEODSS) facility at the northern end of WSMR is highly sensitive to stray light exposure.

Noise - Aviation

Historically, training missions at HAFB have generated aviation noise and caused compatibility issues within the surrounding region. Noise and startle effects from low-level high-speed aircraft operations, primarily along MTRs, can affect local activities, including ranching. The startle effect on livestock can result in property damage or injury to the animals. It should be noted that a large bibliography of studies on the effects of aircraft noise on livestock has found varied effects. Although some studies report inconclusive findings on the overall effects of aircraft noise on domestic animals, a majority of the literature reviewed indicates that domestic animals exhibit minimal behavioral reactions to military overflights and seem to habituate to the disturbances over a period of time (Environmental Impact Statement for the Realistic Bomber Training Initiative, United States Air Force, 2006).

More recently, supersonic operations (by military aircraft using airspace approved for these operations) with the F-22 aircraft have caused sonic booms in the region. Several sensitive spots have been identified by HAFB through calls to the base and public meetings. Most of the affected areas involve residential locations, national parks, refuges, and wilderness areas. The majority of current noise complaints are filed by residents in the communities of the Sacramento Mountains to the east of HAFB, mostly related to sonic booms. HAFB receives about a dozen complaints each month. The Air Force investigates any claims of damage (e.g., broken windows, animal injuries) and verifies the complaint by checking if HAFB aircraft were operating at the time of the event and in the area of the incident.

In addition to the Sacramento Mountain area, sonic booms are intermittently heard throughout the Tularosa Basin and surrounding mountain valleys, including Alamogordo and in neighborhoods east of the City of Las Cruces.

Army helicopter operations are also a source of noise, but with less specific locations since they operate both in restricted areas over military land and in FAA-controlled airspace over non-military land. Helicopter noise is frequently heard around the Alamogordo Airport, Orogrande and the Keyhole area, the Sacramento foothills in northern McGregor Range, and south and east of the Fort Bliss South Training Areas in areas of El Paso County.

The military has defined local noise avoidance procedures for several sensitive locations affected by aircraft noise. While avoidance provides some noise reduction for underlying locations, exposure can continue to create ongoing compatibility challenges for residential areas. Inversely, residential development on the boundaries of an installation can constrain training flexibility.

As described earlier, the AICUZ study describes the average noise environment around HAFB using three noise zones (see **Figure 5.3**):

- Noise Zone III: This is an area around the source of noise in which the Day/Night Average Sound Level (DNL) is greater than 75 decibels. This zone receives severe noise exposure and is deemed unacceptable for noise sensitive activities, such as housing, medical facilities, schools, and churches.

- Noise Zone II: This area is considered to have significant noise exposure and is normally unacceptable for noise-sensitive land uses. It consists of an area where the DNL is between 65 and 75 decibels.

- Noise Zone I: This area, considered to have minimal noise exposure, includes areas in which DNL is less than 65 decibels and is acceptable for all types of land uses.

Within higher noise contours, compatibility guidance suggests residential development with lower populations or non-sensitive land uses, such as commercial or industrial activities to minimize exposure and associated annoyance. As shown in **Figure 5.3**, the highest decibel noise zones are contained within HAFB boundaries. Portions of the noise contours, however, extend to the east, west, and south of the base.

Specific Areas of Sensitivity:

East Mesa:

- Exposure to sonic booms from aircraft operating in WSMR restricted airspace affect existing and developing residential areas in the foothills of the Organ Mountains.

Communities/Observatories in the Sacramento Mountains:

- Communities in the Sacramento Mountains are affected by sonic booms and low-flying aircraft operations in MTRs.

- Apache Point Observatory has noted infrequent issues with mirror vibrations caused by sonic booms from HAFB aircraft. Nighttime helicopter operations using spotlights near the observatory have also forced closure of the telescope to avoid damage to sensitive electronic cameras.

- Residents experience some exposure to noise from Army helicopter operations in the Sacramento foothills in northern McGregor Range.

HAFB AICUZ Noise Contours:

- Reflected in the noise contours that extend to the east, west, and south of the base boundary, some areas proximate to the HAFB airfield are exposed to higher average noise levels generated by arriving and departing aircraft.

Special Areas:

- The following areas can be exposed to noise from aircraft overflights: recreational, cultural, and natural resources that place a value on relative solitude, including Native American religious sites, parks, wildlife refuges, Wilderness Areas, Areas of Critical Environmental Concern, and Protected Activity Centers for threatened species, such as the Mexican Spotted Owl.

- HAFB has adjusted the flight tracks over the years to minimize noise exposure at the WHSA facilities and visitor center.

Orogrande, NM and the "Keyhole" area:

- The community of Orogrande and the "Keyhole" area experience noise from Army helicopter operations.

Noise - Range

Noise is defined as unwanted sound that interferes with normal activities or otherwise diminishes the quality of the environment. The physical characteristics of sound include intensity, frequency, and duration. Most noise associated with Fort Bliss comes from large-caliber weapons training on a variety of weapons systems, including mortars, artillery (e.g. 105- and 155-mm Howitzer), and M1 tanks firing on gunnery and qualification ranges. These sources generate sounds with high levels of acoustic energy similar to a clap of thunder, gunshot, or explosion. This type of sound may be felt as well as heard.

The Army uses both peak noise and day-night average sound levels to assess potential noise impacts on surrounding areas from impulsive sound. The day-night average is expressed as C-weighted noise (CDNL). The CDNL level is measured in decibels (dB) and represents the average sound exposure that would occur in a 24-hour period from noise produced over a one-year timeframe. Peak noise is also measured in decibels, but is expressed as the likely level of noise in a specified area from a one-time event (explosion or weapon firing).

Army guidance establishes three zones for both peak noise and CDNL based on decibel levels that estimate the likelihood that people exposed to the noise source will experience annoyance. Within each zone, certain types of off-installation land uses are considered to be incompatible with military training and operations based on the projected noise levels generated by such activity. In Zone I, typically very few people will be bothered by noise levels and thus land use is generally considered to be unrestricted. In Zone II, as noise levels increase and more people become annoyed by the noise, restrictions or conditions are suggested by the Army on certain land uses such as residences, schools, and medical facilities. Zone III represents the highest potential noise levels and very few land uses are considered to be compatible with Zone III noise levels.

In addition to the three noise zones, the Army has identified the Land Use Planning Zone (LUPZ) as a planning tool for working with communities to promote compatibility. The LUPZ represents the upper end of Zone I noise levels (57 to 62 dB) that may occur during periods of more intense training or increased operations for limited periods. For residential land uses, noise levels in the LUPZ may be considered to have an adverse impact on the surrounding environment (increase in numbers of people annoyed) during periods of sustained training and operations.

Fort Bliss has three major live-fire range complexes that generate impulsive noise: Doña Ana, McGregor, and Meyer. As shown in noise modeling for large caliber weapons, the Organ Mountains act as an effective barrier to noise propagation to the west of the Doña Ana Range Complex. Peak Noise Zones II and III are essentially contained within the installation boundary. Zone III CDNL noise levels are also contained within the installation boundary except in the north where they may extend onto WSMR. Zone II CDNL noise levels, however, are projected to extend off the installation to the south and west and may impact the communities of Chaparral and Anthony, NM, both areas of active, continued growth. Likewise, the LUPZ 57 CDNL extends beyond the boundary to the south and west and potentially affects areas in El Paso (see **Figure 5.1**).

Tank and helicopter live-fire and qualification ranges on the McGregor Range Complex generate noise near the community of Orogrande, New Mexico. Zone II peak and CDNL noise levels reach or approach the eastern portions of the town, but Zone III levels do not extend off the installation and are not projected to affect the Orogrande area.

The Meyer Range Complex in the southeastern portion of the installation is primarily a small arms range, but impulsive C-weighted and peak noise is generated from a demolition range. Zone II peak noise from the demolition range is projected to travel off the installation over a substantial area that extends toward Hueco Tanks State Park. Likewise, Zone I and the LUPZ also extend beyond the installation boundary to the south and east. Zone III noise levels remain on the installation.

In addition to the three major range complexes, Fort Bliss has planned for a .50-caliber machinegun range in the southern training area along Loop 375 near the Fort Bliss Rod and Gun Club. Based on analyses and studies conducted by the Army Public Health Command, Zone II noise levels from that range may reach portions of the adjacent community. However the impacts are expected to be minimal given existing ambient noise levels in the area. Fort Bliss will continue to monitor training that could affect El Paso neighborhoods as use of the range proceeds.

Specific Areas of Sensitivity:

Chaparral, NM:

- The community just south of Fort Bliss experiences noise associated with large-caliber weapons training on the Doña Ana Range.

El Paso, TX:

- Though generally less in impact and more limited in duration, noise from large-caliber weapons training on the Doña Ana Range could affect residential areas to the south in El Paso during periods of sustained training and operations.

- Noise from the .50-caliber machinegun range in the southern training area along Loop 375 near the Fort Bliss Rod and Gun Club may also affect the adjacent community. Development of this range has currently been placed on hold.

Orogrande, NM:

- The community of Orogrande and adjoining areas experience noise from tank and helicopter live-fire and qualification ranges on the McGregor Range Complex.

Hueco Tanks Area:

- Operations on Meyer Range expose the Hueco Tanks area to noise.

Public Trespass/Access

Public trespass on military land is a concern, especially in areas where military activities could place the trespasser at risk of physical harm (e.g. such as in active firing and bombing ranges or areas previously used for the delivery of ordnance). Also, unauthorized access can pose security concerns considering the high value of some assets on the three installations. Within cantonment areas, anti-terrorism barriers are required around facilities (depending on their function), but similar structures and defenses are not in place for most of the boundaries of the three installations in the study area.

One area of concern is McGregor Range, which consists of withdrawn lands jointly managed by the BLM and the U.S. Army. The co-use areas of McGregor Range are available to the public when authorized by the Army through a Recreational Access Permit and subject to training schedules (which take priority). Controlling access to McGregor Range is difficult due to its size and lack of fencing. A small force of range riders patrols the range, but it is relatively easy to come onto the range without a permit. Recent mission changes have brought increased training, such as infantry training and Stryker wheeled vehicle operations into the co-use areas of McGregor Range. Coupled with a rise in population in the surrounding Sacramento Mountains, more hunters and other recreational users are using McGregor Range, often without permits, especially in areas north of NM Highway 506.

Another concern is on the western boundary of Doña Ana Range in the Organ Mountains, where a potential change in land use on the west side of the ridge line (Fillmore Canyon area) is being discussed with the BLM. This area is popular for recreation and is currently adjacent to BLM recreation and a Wilderness Study Area. There are currently no access roads to Fillmore Canyon from the Fort Bliss side. A similar situation occurs farther north in the Organ Mountains at Aguirre Springs, where a campground and trails overlook the Tularosa Basin into WSMR. Steep terrain inhibits trespass at this location, but physical security (of the military assets) and public safety are a concern along any of these accessible boundaries.

The NMSLO also holds game/fish easements in the WSMR call-up areas and has cited the need for an improved system of notification for hunters or other recreational users with permits to access affected lands during testing activity.

While trespass on the main installation area of HAFB is not an issue, approximately 90 percent of the perimeter around HAFB and WSMR is three-strand barbed wire. There have been problems in the past with civilians cutting the wire in order to hunt oryx. In addition, cattle have broken through perimeter fences in order to graze. On a few occasions, lost hikers from WHSA have wandered across the southwestern boundary of HAFB into the main cantonment and airfield area. The east boundary is mostly owned by one family, with associated BLM grazing land. Public access is not currently an issue from this direction, but proximity to Alamogordo may influence activity and uses along this boundary in the future.

Specific Areas of Sensitivity:

Otero Mesa and Sacramento Mountain foothills :

- Increased hunting and recreational activity create the potential for inadvertent public trespass and safety risks in the co-use area of McGregor Range during training operations.

Fillmore Canyon area:

- The popularity of the Fillmore Canyon area as a recreational site raises the potential for inadvertent public access or trespass onto Doña Ana Range.

Northern Fix and Western Call-up Areas:

- Recreational users accessing the call-up areas during testing operations are subject to safety risks.

Transportation

Transportation related impacts from the military mission include periodic road closures due to testing and training activities, military vehicle use of local roadways, and localized traffic impacts resulting from ingress and egress at installation gates.

Missile tests can also cause the closure of Dunes Road, the primary access road to WHSA and restrict activities within the monument, such as camping and horseback riding. WSMR maintains a public telephone line with a recorded message, updated daily, that provides information about upcoming roadblocks, as well as through their social media sites. The NPS WHSA web page also provides information about missile tests and park closures. Finally, the local media disseminates information about road closures to the public.

Some training activities on Fort Bliss result in the brief closure of NM Highway 506, a primary access road for the town of Timberon. Closures of NM Highway 506 have been an area of previous concern for local residents and ranchers north of McGregor Range. Residents want the road open at all times. There are currently no formal agreements in place governing the closures. Fort Bliss safety procedures prioritize emergency response and road access over any scheduled military training. It has been noted that NM Highway 506 closures are increasingly rare.

Local highways also support mission-related traffic, such as convoys traveling from cantonment areas up into the training areas. Wheeled military vehicles can produce additional wear and tear on roads, contributing to increased infrastructure maintenance costs for communities. Such convoys can also generate fugitive dust on adjacent areas. Residents have cited safety concerns when military vehicles travel along community roads, such as Lisa Drive in Chaparral. U.S. 54 in El Paso experiences traffic congestion during peak hours when personnel enter or exit Fort Bliss.

Specific Areas of Sensitivity:

New Mexico Highway 506:

- Convoy crossings result in periodic, brief closure of the roadway.

U.S. 54, El Paso:

- Significant back-ups at post gates during peak hours can affect level of service and safety along U.S. 54.

U.S. 70 and 380:

- Testing results in intermittent roadblocks of these highways.

Lisa Drive, Chaparral:

- Wheeled military vehicles raise safety issues when traveling along a local road with school facilities.

Water
Multiple, overlapping factors affect the region's water supply, including the current exceptional drought, climate change, water quality issues, damage or overuse of specific water sources, and increased demands from military and civilian growth in specific parts of the study area.

Specific Areas of Sensitivity:

Mesilla Aquifer:
- The aquifer level has continued to drop due to the drought, population growth in Las Cruces and Doña Ana County, and growth of water intensive crops, such as pecan trees (Depletion of Aquifer Levels in the Lower Rio Grande, 2012). The potential for litigation between the States of Texas and New Mexico related to the apportionment of water between Doña Ana County and El Paso County and the use of groundwater wells in the Lower Rio Grande could also affect agricultural irrigation.

Hueco Bolson Aquifer:
- Low recharge and high pumping rates have caused significant water-level declines and decreased groundwater availability in the El Paso area (The Hueco Bolson: An Aquifer at the Crossroads, Zhuping Sheng, Robert E. Mace, and Michael P. Fahy, 2001)

- City of El Paso, El Paso Water Utilities, and Fort Bliss have been aggressive in implementing water conservation measures, as well as reuse and desalination strategies to alleviate groundwater demands.

Tularosa Basin Aquifer:
- Introduction of pollutants into the groundwater from chemical spills, stormwater runoff, septic and underground storage tank leakage, agricultural runoff, industrial point sources, and contaminated sediment poses water quality concerns.

- Damage to Bonito Lake from the 2012 Little Bear Fire has interrupted surface water supplies to communities, including Carrizozo, Alamogordo, and HAFB.

- The recent collapse of HAFB's main well and the risk of a cumulative drawdown of the aquifer by increasing numbers of private wells from ranchette development in the Taylor Ranch area could affect HAFB's water supply plans.

Wildfires
Based on fire history at Fort Bliss, the primary risk of wildfire from the military comes from weapons firing and ordnance use. The majority of military-caused fires have been in the Surface Danger Zones for missile firings on McGregor Range. Military-related fires in the Organ Mountains have been infrequent because fuels are discontinuous and fuel loading is low. However, in 2011 a training exercise at Fort Bliss caused a fire on the eastern side of the Organ Mountains that burned about 7,000 remote acres.

Previous analysis from Fort Bliss indicates that even with the increased use of Doña Ana Range, the fire hazard is not anticipated to change significantly. The risk of wildfires from live-fire ranges in the south Tularosa Basin portion of McGregor Range is also not high due to relatively low fuel loading, as well as good fire detection and suppression capabilities. Live-fire ranges are concentrated in discrete areas that are continuously manned and have the infrastructure and fire suppression capability to respond rapidly to fire outbreak. Currently, Fort Bliss is preparing a Wildland Fire Management Plan working in close coordination with the BLM. The BLM is assisting Fort Bliss in preparation of the plan, as well as constructing firebreaks and conducting controlled burns to reduce fuel loads.

Specific Areas of Sensitivity:

Maneuver areas north of NM Highway 506 and the Sacramento Mountain foothills:
- An increased presence of military personnel and vehicles can lead to higher fire risk in the area.

Soledad and Boulder Canyons in Doña Ana County:
- Portions of the canyons have been previously threatened by the spread of wildfire beyond military lands.

09 COMPATIBILITY FACTORS

The overall goal of the JLUS is to create an ongoing and shared informational tool that enables the agencies, jurisdictions, and decision-makers of the region to:

- Understand and anticipate the compatibility issues associated with any particular land use, resource management or mission action;
- Map the physical footprint of the current or foreseeable impacts; and
- Assist in establishing any measures that can reduce impacts.

The informational tool will have both text and Geographic Information System (GIS) components. This section outlines the methodology for building the foundational elements of the compatibility tool. The focus for this initial compatibility analysis is the text-based component. The planning team will continue to collaborate with the Technical Committee to refine the methodology and gather spatial data in support of the mapping functions.

The analysis process is described in the following sequence of topics:

- Compatibility Factors
- General Military and Non-Military Activities and Use Compatibility
- Compatibility Issue Identification
- Compatibility Analysis - Mapping and Overlays

Compatibility Factors

Section 8 highlighted areas of sensitivity in which military operations and community activities physically interact to create compatibility challenges. The purpose of this section is to develop a series of more general factors that describe types of activities, land and resource uses, and potential project-related impacts that can be used to assess the compatibility of ongoing and planned initiatives within the JLUS region. The 19 factors below overlap with the compatibility themes reviewed at the public meetings, but the planning team and Technical Committee have drawn from stakeholder input to refine the list and add new categories when appropriate.

Air Quality

This element focuses on air quality that can be affected by civilian and military activities. Examples may include dust generation from civilian/military construction activities; dust generation from convoy activities; smoke generation from controlled burns on agricultural and managed public lands; and emissions caused by commuter traffic congestion or increased vehicular use.

Airspace (Hazardous Activity)

Activities dangerous to the flight of non-participating aircraft can be created by hazardous operations, such as military exercises involving live or inert expenditures, missile and rocket transit through airspace, aerial target impact (virtual or live), arming of live munitions on aircraft, laser and directed energy use, parachute dropping, high-speed and unpredictable aircraft maneuvers, tethered balloons, or the use of UASs (conditioned on authorizations). This factor includes boundaries of airspace approved for hazardous operations.

Airspace (Non-Hazardous Activity)
Airspace, as a finite, shared geographic area, can become saturated by the amount of air traffic. Activity can occur in the form of military training or testing, civilian air traffic, or commercial operations. The growth in the level of any of these activities can limit the availability of airspace for other operations.

Cultural Resources
This element is defined as the collective evidence of the past activities, practices, and accomplishments of people. Cultural resources encompass archaeological, traditional, and built environment resources, including but not necessarily limited to buildings, structures, objects, prehistoric and historic archaeological sites, historic standing structures, bridges, cemeteries, and monuments. Culturally valued aspects of the environment generally include historic properties, other culturally valued pieces of real property, and the cultural use of the biophysical environment, such as traditional religious practices of Native Americans.

An action results in an adverse effect to a cultural site or property when it alters the qualities of the resource through physical destruction, damage or alteration; isolation of the site or changes in the site's surrounding character; changes in the visual or auditory character of a site, particularly the introduction of unwanted noise; neglect of a property or site; ground disturbance, including erosion from the operation and management of training areas; damage such as vandalism resulting from increased access to a site; or the transfer, sale or lease of land that removes a property or site from protection.

Developed Areas
This factor can be defined as areas of open, natural, or 'raw' land that are converted into housing, recreational, commercial, or industrial activities, or the improvements supporting these uses such as roads, parking lots, and structures. Compatibility issues arise when the development would result in or support a new land use that exposes people to a nuisance such as noise or a safety hazard related to military operations.

Frequency Spectrum
Any electrical circuit can be affected by electromagnetic induction or radiation from an external source. This disturbance can interrupt, limit, or obstruct the performance of that circuit. Electromagnetic energy is used to provide telecommunications services, such as radio, television broadcasting, cellular telephones, hand held automatic car door lock and burglar alarm controls, radio communications for police and fire departments, and satellite communications. Non-communication uses include microwave energy, industrial heating and sealing, medical imagery, and radar used in air traffic control and military surveillance. Any of these uses have the potential to interfere with one another, with effects ranging from annoyance at the disturbance of a television or radio channel, interference with air traffic control, or damage to a sensitive circuit.

Institutional Infrastructure
Institutional infrastructure primarily delivers specialized services to the human population, including: governance infrastructure such as political, legislative, law enforcement, emergency services, and military systems; economic infrastructure such as banking systems, financial institutions, business logistics facilities, manufacturing, and agriculture, forestry, or fishing; social infrastructure, such as the health care, educational, or social welfare systems; and cultural infrastructure such as museums, libraries, sports facilities or parks. As this factor is driven by population, it also may include demographic data and population trends.

Light/Glare
This factor is defined as any sources of light or reflectance off of physical features that may affect civilian or military activities. Examples could include reflectance off of wind turbine blades or solar panels affecting aviation exercises; urban light pollution disrupting viewing quality of observatories; and military installation lighting systems affecting local communities.

Natural Resources
This factor is defined as biotic and abiotic resources that exist within the study area. Biotic resources include wildlife, fish and plant species that can be affected by civilian/military activities. Abiotic resources include soils (note that water/groundwater and air have been classed as separate factors).

Noise/Vibration
Noise generating activities, that can also cause vibrations, are created by a variety of activities, including: munitions testing; airspace operations or tests that cause a sonic boom; persistent noise level, or intermittent, elevated noise (such as low-level overflight); resource extraction activities such as drilling or blasting for mines; and construction or development. Noise and vibration can have a variety of impacts, such as disturbance to wildlife; injury and annoyance to humans; damage to structure or cultural resources; and interference with sensitive instrumentation.

Obstacles/Structures
This factor includes obstacles and certain structures that can be hazardous to safe flight navigation. The FAA Terrain and Obstacles Data Team has specific definitions for these elements, found at: http://tod.faa.gov/tod/public/TOD_ObstacleTypes.html. Examples can include construction cranes, windmills, communications towers, pyrotechnics, balloons, or efflux/exhaust plumes from a structure.

Physical Infrastructure
The capital assets that convey people, vehicles, fluids, energy, or information, including: transportation infrastructure such as roads, bridges, culverts, mass transit, railways, and airports; energy infrastructure such as power transmission lines, electrical generation plants and substations, natural gas or petroleum pipeline, refineries, and wells; water management infrastructure for drinking water, sewage collection, stormwater, irrigation, and flood control; communications infrastructure such as land lines for telephone networks, cable television, communications satellites, television and radio transmission stations; solid waste management infrastructure such as landfills, recycling centers, incinerators, or hazardous waste disposal facilities; and earth monitoring networks such as meteorological monitoring, geodetic benchmarks, GPS, or seismometers.

Physical Security
Physical security is primarily concerned with restricting physical access by unauthorized people (commonly interpreted as intruders) to controlled facilities (government, commercial or private), or protecting sensitive sites such as traditional cultural properties that may be subject to vandalism or theft.

Protected Areas
These are areas that are protected by federal and state government entities, but can be affected by military activities, including State Parks, National Monuments, Areas of Critical Environmental Concern, Protected Activity Centers, National Wilderness Areas, and National Wildlife Refuges.

Recreational Resources
This factor is described as the recreational uses of an area that include any type of outdoor activity in which people participate. Activities may include uses such as hiking, climbing, fishing, camping, cycling, boating, and ATV use. This factor includes developed recreational sites and trails, public sporting arenas/ball fields, amphitheaters, outdoor performance areas, racing tracks, parks and monuments.

Resource Extraction/Development
This factor is defined as activities (civilian and military) focused on extracting and developing physical resources. These extraction and development activities and related infrastructure can affect ongoing activities on military installations or within surrounding communities. Examples include mining activities that generate noise/vibration and could disrupt sensitive military observation equipment; natural gas and oil extraction, refinement and delivery; water system treatment and delivery infrastructure; quarry and gravel extraction and refinement processes and associated infrastructure.

Surface Contamination
This factor is defined as areas where activities and uses have caused surficial contamination. Any future use of the area should involve a site assessment to ensure future use of the area will not expose individuals to health and safety risks. Examples may include areas under airspace used persistently for chaff and flare expenditures, ordnance target sites, unexploded ordnance (UXO) areas, chemical/biological applications, and industrial site uses.

Water Resources
This factor includes both surface water and groundwater resources whose quantity and quality may be affected by civilian and military activities and uses. This may include natural features such as an underground aquifer or watershed area, or infrastructure such as a desalination plant, pipelines, treatment facilities, or well field.

Wildfires
This factor considers wildfire initiation resulting from various military activities, which produce sparks, fire, and explosions. Factors that contribute to fire danger from military off-road vehicle training include fuel load (type, quantity, and moisture content of vegetation), climate, terrain, length of time before a fire is reported, and response capability. Conversely, wildfire can also be generated by civilian sources such as controlled burns that are not successfully managed, campsites, cigarette butts, and other inadvertent causes. Wildfires can produce impacts such as degraded air and water quality, the loss of vegetative cover and resulting soil erosion, disturbance of flora and fauna, and safety and health risks to humans.

Military and Non-Military Activity and Use Compatibility
Table 9.1 provides an overall assessment of how activities and uses affect other compatibility factors. Interactions can fall into two categories:

- Compatible (shown in green) – both activities/uses can occur near one another without significant adverse impacts; or

- Potential compatibility factor (shown in yellow) - more review is necessary to determine if the interactions are compatible; guidance may suggest additional steps such as communication or a specific physical mitigation to reduce the anticipated impact (conditionally compatible) or further analysis may identify exclusion as the most appropriate course of action (incompatible).

Incompatibility occurs when the interaction creates impacts of a level sufficient to generate a safety threat or create conditions that degrade the quality of the affected factor. The DoD produces compatibility guidance on land uses within designated air safety zones (Accident Potential Zones) and noise contours (see **Technical Appendix**). The planning team draws from this guidance but has also identified compatibility for a series of factors tailored for this JLUS study. The factors shown in **Table 9.1** can be influenced by any of the land and resource managers in the region, including local governments, state or federal agencies, or the military installations.

Given the complexity of many of the factors in the study area, **Table 9.1** is intended as the basis for the initial interface of the shared informational tool. Users would reference the table to conduct a preliminary screening of compatibility risks between activities. The designation of a potential compatibility factor (shown in yellow) then directs the user to the more detailed **Appendix** tables to understand the underlying issues associated with the factors.

Compatibility in the context of the JLUS is the relationship between military and surrounding non-military activities. The **Technical Appendix** includes two tables that examine the compatibility factors from each perspective. The tables describe general types of military activities and uses (effectors or the cause of a potential impact) and potential receptors in surrounding areas (uses, locations or resources that can be affected by the activity); and inversely, general types of non-military activities and uses that affect military operations.

The tables also indicate data sets that can be used to identify the physical footprint of a particular activity or use. These data sets are critical for conducting the spatial analysis that shows where compatibility issues can emerge.

Compatibility Issue Identification
The next step in the analysis is to assign more specific issues to each compatibility factor and to examine these issues relative to each of the three installations. The tables in the **Technical Appendix** describe the factor, the cause, the specific compatibility issue, and potential GIS data sets to identify areas of likely interaction. The tables assess how each of the three installations affects the surrounding areas and then how uses and activities in the communities can affect military operations. These tables represent the most detailed level of compatibility analysis conducted for the JLUS.

Compatibility Analysis - Mapping and Overlays
The final step in the analysis is to overlay available GIS data sets to determine where conditionally compatible or incompatible interactions may occur. Data sets are the building blocks for displaying compatibility issues geospatially. The compatibility tool will compile a comprehensive list of geospatial data collected for this study. The list will include both data acquired and data identified as potentially useful or relevant. Data may be very specific or general (for a large area or at a macro level). Any data set may be useful or relevant for more than one compatibility factor.

Primary GIS data sources for the SNM-EP JLUS include the three installations, the six counties, the States of New Mexico and Texas, the BLM, NMSLO, and various publicly accessible government websites.

Some compatibility overlays involve clearly defined data sets and issues. For example, residential uses falling inside higher noise zones constitute a clear compatibility challenge. Some factors in the study, such as GPS jamming and frequency spectrum interference lack a currently available data set. The planning team will continue to explore with the Technical Committee alternatives for displaying less concrete compatibility issues. Strategies might include the development of conceptual mapping or the use of text to describe the interaction.

Factors	Air Quality	Airspace (Hazardous Activity)	Airspace (Non-Hazardous Activity)	Cultural Resource	Developed Areas	Frequency Spectrum	Institutional Infrastructure	Light/Glare	Natural Resource	Noise/Vibration	Obstacles/Structures	Physical Infrastructure	Physical Security	Protected Area	Recreational Resource	Resource extraction/ development	Surface Contamination	Water Resource	Wildfires	Surface Safety Hazard
Air Quality	NA	NA	NA	NA		NA	NA	NA	NA	NA	NA	NA	NA				NA	NA		NA
Airspace (H.A.)[1]	NA	NA																		
Airspace (N.H.A.)[2]	NA		NA															NA		
Cultural Resource	NA			NA					NA									NA		
Developed Areas[3]					NA															
Frequency Spectrum[4]	NA					NA		NA			NA						NA	NA	NA	
Institut. Infrastructure[5]	NA						NA				NA									
Light/Glare	NA					NA		NA		NA	NA	NA	NA	NA			NA	NA	NA	
Natural Resource	NA			NA					NA				NA					NA		
Noise/vibration	NA							NA		NA							NA	NA	NA	NA
Obstacles/Structures	NA					NA	NA	NA			NA	NA					NA			
Physical Infrastructure	NA							NA			NA	NA								
Physical Security	NA							NA	NA				NA				NA	NA	NA	NA
Protected Area								NA						NA						
Recreational Resource															NA			NA		
Res. extract./develop.[6]																NA				
Surface Contamination	NA					NA		NA		NA	NA		NA				NA		NA	
Water Resource	NA		NA			NA		NA		NA			NA		NA			NA		
Wildfires						NA		NA		NA			NA				NA		NA	
Surface Safety Hazard	NA									NA			NA							NA

Table 9.1 | Military and Non-Military Activity and Use Compatibility

NA - Not Applicable
Compatible
Potential Compatibility Factor

[1] Airspace (Hazardous Activity; [2] Airspace (Non-Hazardous Activity);[3] Developed areas include concentrated activity/growth/urban); [4] Category covers non-hazardous spectrum; [5] Institutional Infrastructure; [6] Resource extraction/development

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