

Joint Base Lewis-McChord (JBLM) Joint Land Use Study (JLUS)



Land Use Compatibility Analysis Final



October 2015

Executive Summary

The Joint Land Use Study (JLUS) for Joint Base Lewis-McChord (JBLM) is a strategic plan that provides specific implementation actions to ensure compatible civilian growth and development in the vicinity of JBLM. The JLUS presents recommendations for consideration by local and state governments that promote compatible development and to protect public health, safety, and welfare while also protecting the ability of the military to accomplish its vital training and operational missions both now and over the long term. To be developed as part of the JLUS process, an Implementation Plan will contain details such as the timing, order of magnitude costs, potential funding sources, lead and partner jurisdictions/ agencies/ organizations, and supporting background information such as model ordinances. The final JLUS Report will comprise the results of the Existing Conditions Report, the Land Use Compatibility Analysis (this report), and the Implementation Plan.

The JBLM JLUS is made possible through a grant from the Department of Defense (DoD) Office of Economic Adjustment (OEA) to the City of Lakewood and coordinated by the South Sound Military and Communities Partnership (SSMCP). A consultant team of AECOM, 3 Square Blocks, and Transpo Group prepared this report for the City of Lakewood. Additionally, a wide array of partners is involved in the study process, including but not limited to:

- DoD OEA
- JBLM Headquarters and staff
- Washington State Department of Commerce
- Nisqually Indian Tribe
- Thurston Regional Planning Council (TRPC)
- Pierce County
- Thurston County
- City of DuPont
- City of Lacey
- City of Lakewood
- City of Rainier
- City of Roy
- Town of Steilacoom
- City of Tacoma
- Tacoma-Pierce County Chamber
- Tacoma-Pierce County Health Department
- City of Yelm

A JLUS study area was established early in the JLUS process to ensure that stakeholders and any potential impacts were identified, and as a preliminary means to account for base security and anti-terrorism/force protection. It extends roughly 2 miles outside the entire JBLM installation boundaries, and includes the following extensions: north into Tacoma to include the Accident Potential Zones (APZs) of McChord Field, and routes to the Port of Tacoma; south to include all

of the cities of Yelm and Rainier; southwest to include all of the Nisqually National Wildlife Refuge and the Nisqually Indian Reservation; the eastern portion of Olympia/Lacey, and routes to the Port of Olympia; and west to include the Town of Steilacoom.

This JLUS, in part, builds upon the results of prior studies, including the 2010 JBLM Growth Coordination Plan (GCP) and the 1992 McChord Air Force Base (AFB) and Fort Lewis Joint Land Use Study. Since the 1992 JLUS was completed, the two installations have been combined into a joint base and grown considerably, missions have changed, and significant urban growth has occurred adjacent to or near JBLM. While some specific compatibility issues identified in the previous (1992) JLUS have been resolved and some others are no longer relevant, several persistent issues remain that are being addressed in the 2015 JLUS.

Most current land uses around JBLM do not have negative impacts on military capabilities; however, some ongoing and potential new or future areas of concern were identified through the current JLUS process. Continued collaboration is needed between local jurisdictions and JBLM to develop and implement regional solutions to these issues, and to support the military's ability to carry out its mission requirements today and in the future.

This report presents the findings of the Land Use Compatibility Analysis. It contains a summary of the current land use context; a summary of relevant land use compatibility guidance; a description of the compatibility analysis methodology; geographic information system (GIS) mapping and analysis of land use and military impacts; conclusions; and a preliminary list of compatibility strategies.

This Land Use Compatibility Analysis report also proposes a menu of strategies intended to mitigate existing incompatible land uses, and to ensure future compatible development. The menu of strategies is organized around the seven compatibility issues analyzed in this report and is found in Section 6.

The purpose of the Land Use Compatibility Analysis report is twofold:

- To conduct quantitative and qualitative analyses to identify existing or potential incompatible land uses between nearby communities and JBLM.
- To identify preliminary strategies to address the incompatibilities identified in the analysis.

The Land Use Compatibility Analysis is structured around the following issues:

- Urban growth
- Aircraft safety
- Noise from military operations
- Threatened and endangered prairie species and habitat
- Regional transportation impacts
- Trespass and unauthorized access to JBLM range and training lands

- Communication and coordination

The consultant team developed a five-prong definition of compatibility, based on OEA JLUS guidance, to guide this land use compatibility analysis for the JLUS. For the purposes of the JBLM JLUS, compatible uses are defined as land uses that:

- Do not interfere with military training and operations.
- Include civilian and JBLM land uses that exist harmoniously alongside each other.
- Do not expose people to undue safety risks or nuisance.
- Maintain quality of life.
- Balance safety, growth, and development.

Compatibility issues arise when land uses do not reflect this definition. Compatibility issues can vary depending on types of land uses and exposures, and may evolve over time. The land uses listed below may be incompatible when located near military training and operational activities.

- Noise-sensitive uses, such as housing, schools, medical facilities or places of worship, and uses that cannot be readily sound-attenuated, such as manufactured housing.
- Uses that concentrate people (certain higher residential densities, schools, theaters).
- Uses that can interfere with safe air navigation, such as tall structures; activities that emit electrical currents that may impair aircraft equipment; or activities that throw off excessive light, smoke, or dust and may impair pilot vision.
- Uses that attract birds and other wildlife that can interfere with safe aviation.

The tables below represent a high-level summary of detailed federal guidelines. Decisions about land use compatibility are not always “black and white,” and there are some grey areas where compatibility is influenced by community context, site conditions, or other factors. Federal guidelines referenced in this analysis are advisory. It is the responsibility of local jurisdictions to make policy and regulatory decisions regarding land uses under their jurisdiction.

Table ES-1 shows the compatibility of various types of land uses in areas where there is risk of aircraft accident, and Table ES-2 shows the same for areas where there is risk of public nuisance complaint due to noise exposure. Land uses shown in red are categorized as incompatible within the given zones, meaning that they are not recommended based on federal compatibility guidance, and their impacts are significant enough that mitigation may not be effective. Uses depicted in yellow are categorized as conditionally compatible and may warrant mitigation measures, such as noise attenuation or real estate disclosure, to reduce conflicts. Land uses shown in green are categorized as compatible with nearby military operations and training activities.

Table ES-1. Land Use Compatibility Summary: Aircraft Safety.

Land Use	Clear Zone (CZ)	Accident Potential Zone I (APZ I)	Accident Potential Zone II (APZ II)
Single-family Detached	Incompatible	Incompatible	Conditionally Compatible
All Other Residential	Incompatible	Incompatible	Incompatible
Mixed-Use Center	Incompatible	Incompatible	Conditionally Compatible
Light Commercial	Incompatible	Conditionally Compatible	Compatible
Heavy Commercial	Incompatible	Incompatible	Compatible
Light Industrial	Incompatible	Compatible	Compatible
Heavy Industrial	Incompatible	Incompatible	Compatible
Institutional/Public Use	Incompatible	Incompatible	Incompatible

Source: This table summarizes land use compatibility guidance from the Land Use Compatibility Guidelines for APZs (DoD 1977), Department of Defense Instruction 4165.57, Air Installations Compatible Use Zones, The Air Force Handbook 32- 7084 AICUZ Program Manager's Guide (DoD 1999) and UFC 3-260-01.

Table ES-2. Land Use Compatibility Summary: Military Operational Noise.

Land Use	Aircraft Noise Zone III: >75 DNL dBA (Not recommended w/ any noise-sensitive uses)	Aircraft Noise Zone II: 65-75 DNL dBA (Normally not recommended with noise-sensitive uses)	Aircraft Noise Zone I: <65 DNL dBA (Generally acceptable with any noise-sensitive uses)	Large Weapon CDNL Noise Zone III: >70 CDNL dBC (Incompatible with noise sensitive uses)	Large Weapon CDNL Noise Zone II: 62-70 CDNL dBC (Normally incompatible with noise-sensitive uses)	Large Weapon CDNL Noise Zone I: <62 CDNL dBC (Compatible with most noise-sensitive uses)	JBLM Firing Range Large Weapon PK15(met) Noise Zone: 115-130 dBP (Noise-sensitive uses are discouraged)	JBLM Firing Range Large Weapon PK15(met) Noise Zone: >130 dBP (Noise-sensitive uses are strongly discouraged)
All Residential	Incompatible	Incompatible	Conditionally compatible	Incompatible	Incompatible	Conditionally Compatible	Incompatible	Incompatible
Commercial	Conditionally compatible	Conditionally compatible	Compatible	Conditionally compatible	Conditionally compatible	Compatible	Conditionally compatible	Conditionally compatible
Industrial	Conditionally compatible	Conditionally compatible	Compatible	Conditionally compatible	Conditionally compatible	Compatible	Conditionally compatible	Conditionally compatible
Institutional /Public Use	Incompatible	Incompatible	Conditionally compatible	Incompatible	Incompatible	Conditionally Compatible	Incompatible	Incompatible

Source: This table summarizes land use compatibility guidance from several sources, including The Federal Interagency Committee on Urban Noise Guidelines for Considering Noise in Land Use Planning (FICUN 1980), the Land Use Compatibility Guidelines for APZs (DoD 1977), the Air Force Handbook 32- 7084 AICUZ Program Manager's Guide (DoD 1999), and Army Regulation 200-1 (DoD 2007).

General Conclusions

Most current land uses around JBLM do not have negative impacts on military capabilities; however, some ongoing and potential new or future areas of concern were identified through the current JLUS process. Continued collaboration is needed between local jurisdictions and JBLM to develop and implement regional solutions to these issues and to support the military's ability to carry out its mission requirements today and in the future. Based on the analysis contained in this report, several conclusions are drawn and are summarized in Table ES-3.

Table ES-3. Summary of Conclusions.

Compatibility Issue	Conclusions
Urban Growth	<ul style="list-style-type: none"> • Additional urban growth within the McChord Field North CZ should be prohibited. • Urban growth should be directed away from high noise areas and APZs, where feasible. • Significant growth capacity in the Thurston Highlands Master Planned Community represents potential incompatibility.
Aircraft Safety	<ul style="list-style-type: none"> • Existing non-conforming incompatible uses in the McChord Field north CZ represent the most critical encroachment issue facing JBLM. • JBLM should seek federal, state, and local funding to resume property acquisition efforts in the McChord north CZ. • In APZ II, medium and high density residential uses in Tacoma and recreational uses in Lakewood are categorized as incompatible. • Jurisdictions should seek to phase out incompatible uses in APZs through zoning, property acquisition, and public facility siting decisions.
Noise	<ul style="list-style-type: none"> • Areas in Lakewood and Tacoma near I-5 are zoned for residential, mixed use, and recreational uses categorized as incompatible or conditionally compatible. • Incompatible or conditionally compatible land uses in the JBLM large weapon noise zones include Roy, parts of Yelm and DuPont, the Nisqually Indian Reservation, and parts of the urban growth area in unincorporated Thurston County near Lacey.
Endangered and Threatened Species and Habitat	<ul style="list-style-type: none"> • Listed species requirements limit the scope of training on JBLM training lands.
Transportation	<ul style="list-style-type: none"> • Continuation of current and exploration of new solutions for JBLM-related and other traffic are needed, particularly as it affects local road networks.
Trespass and Unauthorized Access to JBLM Range and Training Lands	<ul style="list-style-type: none"> • The continuing management of access to training lands will limit trespass and competition for access to military training lands while maintaining legitimate compatible recreational uses.
Communication and Coordination	<ul style="list-style-type: none"> • Communication and coordination among JLUS partners are critical for the implementation of compatibility recommendations.

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Acronyms and Abbreviations

ACP	Access Control Point
ACUB	Army Compatible Use Buffer
ADU	Accessory Dwelling Unit
AFB	Air Force Base
AICUZ	Air Installation Compatibility Use Zone
APZ	Accident Potential Zone
AT/FP	anti-terrorism/force protection
BRAC	Base Realignment and Closure
CDNL	C-weighted Day-Night Level
CFR	Code of Federal Regulations
CNLM	Center for Natural Lands Management
CZ	Clear Zone
dBA	Decibels, A-weighted
dB	Decibels, C-weighted
DoD	Department of Defense
DPTMS	Directorate of Plans, Training, Mobilization, and Security
DSHS	Department of Social and Health Services
FEIS	Final Environmental Impact Statement
FHWA	Federal Highway Administration
FICUN	Federal Interagency Committee on Urban Noise
FY	Fiscal Year
GCP	Growth Coordination Plan
GIS	geographic information system
GMA	Growth Management Act
GMCC	Growth Management Coordination Committee
HOV	High Occupancy Vehicle
I-5	Interstate 5
IJR	Interchange Justification Report
IONMP	Installation Operational Noise Management Plan
JBLM	Joint Base Lewis-McChord
JLUS	Joint Land Use Study
MIF	Military Installation Fund
MTRs	Military training routes
MWR	Morale, Welfare, and Recreation
NGO	non-governmental organization
NRCS	Natural Resources Conservation Service
OEA	Office of Economic Adjustment
PK15	Peak Noise Level
PSRC	Puget Sound Regional Council
RCW	Revised Code of Washington
REPI	Readiness and Environmental Protection Initiative
RFP	Request for Proposals
RMI	Regional Military Influence
ROW	right-of-way
SPP	Sustainability in Prisons Program
SSMCP	South Sound Military and Communities Partnership

TDM	transportation demand management
TRPC	Thurston Regional Planning Council
TWG	Technical Working Group
UGA	Urban Growth Area
USDA	U.S. Department of Agriculture
USDOl	U.S. Department of the Interior
USFWS	U.S. Fish and Wildlife Service
UXO	unexploded ordnance
WDFW	Washington Department of Fish and Wildlife
WDNR	Washington Department of Natural Resources
WSDOT	Washington State Department of Transportation

Land Use Compatibility Analysis

1. Introduction

The Joint Land Use Study (JLUS) for Joint Base Lewis-McChord (JBLM) is a collaborative process among local, regional, state, federal, and tribal partners that is designed to create dialogue around complex land use issues related to JBLM. The Department of Defense (DoD) Office of Economic Adjustment (OEA) administers the JLUS program and provides funding and guidance to local communities. The JBLM JLUS is made possible through a grant from the DoD OEA to the City of Lakewood and coordinated by the South Sound Military and Communities Partnership (SSMCP).

A JLUS study area was established early in the JLUS process to ensure that stakeholders and any potential impacts were identified, and as a preliminary means to account for base security and anti-terrorism/force protection (AT/FP). The JLUS study area extends approximately 2 miles outside the entire JBLM installation boundaries, and includes the following extensions: north into Tacoma to include the Accident Potential Zones (APZs) of McChord Field, and routes to the Port of Tacoma; south to include all of the cities of Yelm and Rainier; southwest to include all of the Nisqually National Wildlife Refuge and the Nisqually Indian Reservation; the eastern portion of Olympia/Lacey, and routes to the Port of Olympia; and west to include the Town of Steilacoom. See Figure 1.

To reflect the complexity of the study area, a wide array of partners are involved in the study process, including but not limited to:

- DoD OEA
- JBLM Headquarters and staff
- Washington State Department of Commerce
- Nisqually Indian Tribe
- Thurston Regional Planning Council (TRPC)
- Pierce County
- Thurston County
- City of DuPont
- City of Lacey
- City of Lakewood
- City of Rainier
- City of Roy
- Town of Steilacoom
- City of Tacoma
- Tacoma-Pierce County Chamber
- Tacoma-Pierce County Health Department
- City of Yelm

The 2006 *OEA Joint Land Use Study Program Guidance Manual* (OEA 2006) notes that the “JLUS is produced by and for the local jurisdiction(s). It is intended to benefit both the local community and the military installation...”

The Guidance Manual further defines JLUS program objectives as twofold:

- *“To encourage cooperative land use planning between military installations and the surrounding communities so that future civilian growth and development are compatible with the training or operational missions of the installation; and*
- *To seek ways to reduce the operational impacts on adjacent land.”*

The JBLM JLUS is a strategic plan that provides specific implementation actions to ensure compatible civilian growth and development. The JLUS presents recommendations for consideration by local and state governments that promote compatible development and protect public health, safety, and welfare while also protecting the ability of the military to accomplish its vital training and operational missions currently and over the long term.

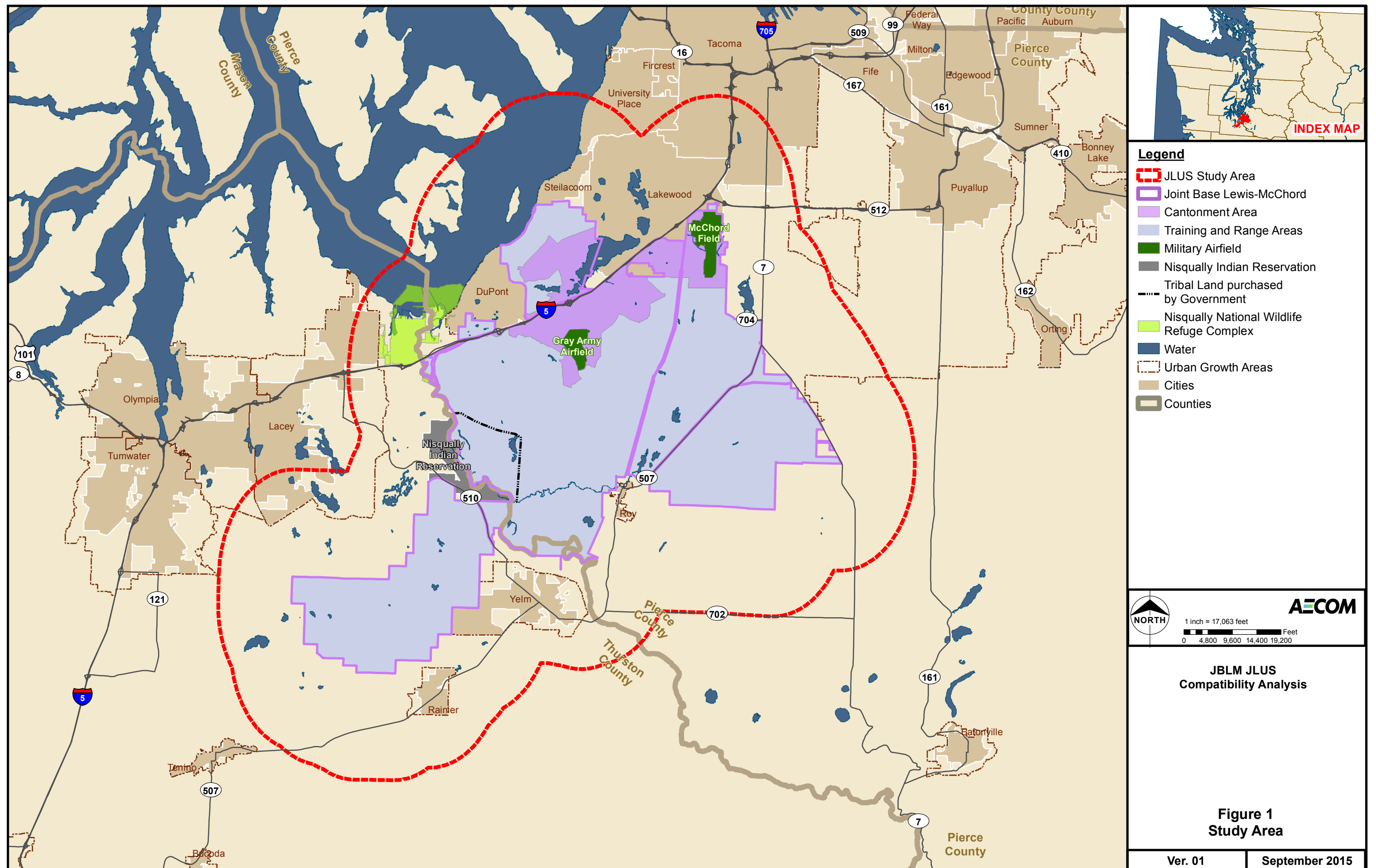
A consultant team of AECOM, 3 Square Blocks, and Transpo Group has prepared this Land Use Compatibility Analysis Report, which is one component of the overall JLUS process. Its purpose is to identify existing and potential future incompatible land uses around the base, and to identify preliminary recommendations to ensure the ability of the military to accomplish its training and operational missions while protecting public health, safety, and welfare in the communities surrounding the military installation

The Land Use Compatibility Analysis builds on the findings of the Existing Conditions Report (AECOM et al. 2015). It identifies existing and potential incompatible land uses. It proposes a preliminary list of strategies to mitigate for existing incompatibility and ensure compatible future development.

Based on the review and guidance of the JBLM JLUS Technical Working Group (TWG) and the SSMCP JLUS Subcommittee, this preliminary list of strategies will be refined and prioritized, resulting in an actionable Implementation Plan. The Implementation Plan will contain details including the timing, order of magnitude costs, potential funding sources, lead and partner jurisdictions/agencies/organizations, and supporting background information such as model ordinances. The final JLUS Report will comprise the results of the Existing Conditions Report, the Land Use Compatibility Analysis, and the Implementation Plan.

The purpose of the Land Use Compatibility Analysis Report is twofold:

- To conduct quantitative and qualitative analysis to identify existing or potential incompatible land uses between nearby communities and JBLM.
- To propose preliminary strategies that address the incompatibilities identified in the analysis.



The Existing Conditions Report identified and described seven initial compatibility issues to address during the JLUS process. These issues provided the starting point for the compatibility analysis. The analysis is structured around the issues of:

- Urban growth
- Aircraft safety
- Noise from military operations
- Threatened and endangered prairie species and habitat
- Regional transportation impacts
- Trespass and unauthorized access to JBLM range and training lands
- Communication and coordination

This report presents the findings of the Land Use Compatibility Analysis. It contains a summary of the current land use context; a summary of relevant land use compatibility guidance; a description of the compatibility analysis methodology; geographic information system (GIS) mapping and analysis of land use and military impacts; conclusions; and a preliminary list of compatibility strategies.

2. Current Context

This JLUS, in part, builds upon the results of prior studies, including the 2010 JBLM Growth Coordination Plan (GCP) (City of Lakewood. 2010) and the 1992 McChord Air Force Base (AFB) and Fort Lewis Joint Land Use Study (McChord AFB and Fort Lewis 1992). The 1992 JLUS and the GCP represent strong relationships and coordination among surrounding communities and the U.S. DoD. Numerous ongoing coordination activities strengthen military-civilian relationships, and go a long way in ensuring compatibility of military and civilian activities.

During the JBLM Growth Coordination process, however, stakeholders suggested that a revised JLUS was needed to address the changing nature of land uses associated with both JBLM and surrounding jurisdictions. Detailed recommendations about the need for this JLUS are contained in the GCP and Land Use Appendix to the GCP and are summarized here to provide context.

As a result of the 2005 Base Realignment and Closure (BRAC) process, the two military installations were combined into JBLM. Military missions have changed and significant urban growth has occurred in the region since the 1992 JLUS. The population of Pierce County increased 13.5 percent from 700,818 in 2000 to 795,225 in 2010. Thurston County's population increased 21.7 percent from 207,335 in 2000 to 252,264 in 2010. The JBLM population has fluctuated over that time due to changing missions, conflicts overseas, deployment and redeployment cycles, and currently, Army downsizing. The U.S. Census indicated that in 2000, the on-base population of JBLM was 19,089. JBLM reports that, as of June 2015, the on-base population stands at 23,700. Region-wide, the JBLM-supported population, which includes full-time military, family members, and dependents; DoD employees; and civilian contractors; living on base and in neighboring communities, stands at more than 130,000.

The 1992 JLUS resulted in several successful implementation actions. Most significantly, both Pierce County and the City of Lakewood have addressed land use impacts related to JBLM within their comprehensive plans and development regulations, particularly with regard to land uses in the McChord Field north Clear Zone (CZ) and Accident Potential Zones (APZs).

Property acquisition by the U.S. Air Force, using federal and state funding and funding from Pierce County, City of Tacoma, and City of Lakewood, within the north CZ and APZs has occurred to remove some incompatible land uses. Funding for property acquisition was provided, in part, through the Readiness and Environmental Integration (REPI) program. Congress authorized REPI in 2003 to address a variety of encroachment issues, including incompatible land uses within CZs. Current DoD policy has, however, precluded the use of REPI funds for the acquisition of property in a CZ. DoD policy requires that installations have control over land within their CZs and that any efforts to acquire property for this purpose should be funded by the service, not the REPI program. Because REPI funding for property acquisition is no longer available, and because not all property owners within the McChord north CZ are willing sellers, efforts to remove incompatible land uses in the CZ have reached an impasse. Unless and until DoD REPI funding policy changes, JBLM will need to seek alternate funding

sources for future property acquisition. Such funding sources may include OEA, state, or contributing funds from local jurisdictions.

While some specific compatibility issues identified in the previous study have been resolved and some others are no longer relevant, several persistent issues remain that will be addressed in this 2015 JLUS. However, land uses categorized as incompatible still exist within the north CZ and APZs, regional transportation impacts continue to pose a significant challenge, and noise impacts remain as missions have evolved.

3. Evaluation of Land Use Compatibility

The following section describes the overall approach to the Land Use Compatibility Analysis. This section:

- Defines compatibility.
- Summarizes relevant federal and other compatibility guidance.
- Provides a brief overview of the compatibility issues being analyzed.
- Describes the applicable geographic extent, or study area, within which each issue applies.

For purposes of evaluating compatibility of land uses around JBLM, the JLUS draws guidance from several federal level sources, including The Federal Interagency Committee on Urban Noise Guidelines for Considering Noise in Land Use Planning (FICUN 1980), the Land Use Compatibility Guidelines for APZs (DoD 1977), Department of Defense Instruction 4165.57, Air Installations Compatible Use Zones, The Air Force Handbook 32- 7084 AICUZ Program Manager's Guide (DoD 1999), Army Regulation 200-1 (DoD 2007), and Unified Facilities Criteria (UFC) 3-260-01 for airfield and heliport planning. These publications include suggested guidelines for whether various types of land uses within airfield safety zones and noise zones should be considered incompatible, conditionally compatible or compatible with military installations.

The guidelines listed above are advisory in nature and are intended to convey exposure to impacts generated by military training and operations in order to inform community decisions regarding land use. Only local governments have the authority to determine allowable land uses on private lands within their jurisdiction.

The analysis presented in this report, as well as the recommendations resulting from this JLUS, seek to strike a balance between the consistent application of federal guidance for the purposes of data analysis and mapping, and real-world policy implications. In the analysis sections that follow, land uses are categorized as compatible, conditionally compatible, or incompatible, based on the application of the guidance cited above. However, the policy recommendations that are made to address the findings of the compatibility analysis consider other factors such as the extent or severity of certain incompatible uses (recognizing that limited areas of uses categorized as incompatible may be consider *de minimus*) and the practicability of implementation. Policy recommendations are intended to be forward-looking, with a focus on preventing additional incompatible uses (e.g., preventing upzoning) rather than creating large areas of non-conforming uses through downzoning.

3.1. Definition of Compatibility

The consultant team developed a five-prong definition of compatibility, based on OEA JLUS guidance (OEA 2006), to guide this land use compatibility analysis for the JLUS. For the purposes of the JBLM JLUS, compatible uses are defined as land uses that:

- Do not interfere with military training and operations.
- Include civilian and JBLM land uses that exist harmoniously alongside each other.
- Do not expose people to undue safety risks or nuisance.
- Maintain quality of life.
- Balance safety, growth, and development.

Compatibility issues arise when land uses do not reflect this definition. Compatibility issues can vary depending on types of land uses and exposures, and may evolve over time. The land uses listed below may create compatibility concerns when located near military training and operational activities.

- Noise sensitive uses, such as housing, schools, medical facilities, or places of worship and uses that cannot be readily sound attenuated, such as manufactured housing.
- Uses that concentrate people (certain higher residential densities, schools, theaters).
- Uses that can interfere with safe air navigation such as tall structures; activities that emit electrical currents that may impair aircraft equipment; or activities that throw off excessive lighting, smoke, or dust and may impair pilot vision.
- Uses that attract birds or other wildlife that can interfere with safe aviation.

3.2. State-Level Compatibility Guidance

The local governments around JBLM make land use decisions in the context of Washington State law and policy guidance provided by the Puget Sound Regional Council (PSRC). Revised Code of Washington (RCW) 36.70A.530 states that military installations are of particular importance to the economic health of the state of Washington, and it is a priority of the state to protect the land surrounding our military installations from incompatible development; thus, per state law as well as federal guidance, local governments should not allow development in the vicinity of a military installation that is incompatible with the installation's ability to carry out its mission requirements. A city or county may find that an existing comprehensive plan or development regulations are not compatible with the installation's ability to carry out its mission requirements. Local jurisdictions are required to submit comprehensive plans for military installation review and comment. Similarly, policy guidance published in PSRC's regional growth management plan, VISION 2040 (PSRC 2009), calls for jurisdictions in the region to protect military lands from encroachment by incompatible uses.

The tables below represent a high-level summary of detailed federal guidelines. Decisions about land use compatibility are not always black and white and there are some grey areas where compatibility is influenced by community context, site conditions and other factors.

Table 1 identifies the compatibility of various types of land uses in areas where there is risk of aircraft accident. Table 2 shows the same for areas where there is risk of public nuisance complaint due to noise exposure. Land uses shown in red are categorized as incompatible

within the given zones, meaning that they are not recommended based on federal compatibility guidance, and their impacts are significant enough that mitigation may not be effective. Uses depicted in yellow are categorized as conditionally compatible and may warrant mitigation measures, such as noise attenuation or real estate disclosure, to reduce conflicts. Land uses shown in green are considered compatible with nearby military operations and training activities and require no action.

Table 1. Land Use Compatibility Summary: Aircraft Safety.

Land Use	Clear Zone (CZ)	Accident Potential Zone I (APZ I)	Accident Potential Zone II (APZ II)
Single-Family Detached	Incompatible	Incompatible	Conditionally Compatible
All Other Residential	Incompatible	Incompatible	Incompatible
Mixed Use Center	Incompatible	Incompatible	Conditionally Compatible
Light Commercial	Incompatible	Conditionally Compatible	Compatible
Heavy Commercial	Incompatible	Incompatible	Compatible
Light Industrial	Incompatible	Compatible	Compatible
Heavy Industrial	Incompatible	Incompatible	Compatible
Institutional/Public Use	Incompatible	Incompatible	Incompatible

Source: This table summarizes land use compatibility guidance from the Land Use Compatibility Guidelines for APZs (DoD 1977), Department of Defense Instruction 4165.57, Air Installations Compatible Use Zones, The Air Force Handbook 32- 7084 AICUZ Program Manager's Guide (DoD 1999), and UFC 3-260-01.

Table 2. Land Use Compatibility Summary: Military Operational Noise.

Land Use	Aircraft Noise Zone III: >75 DNL dBA (Not recommended w/ any noise sensitive uses)	Aircraft Noise Zone II: 65-75 DNL dBA (Normally not recommended with noise-sensitive uses)	Aircraft Noise Zone I: <65 DNL dBA (Generally acceptable with any noise-sensitive uses)	Large Weapon CDNL Noise Zone III: >70 CDNL dBC (Incompatible with noise-sensitive uses)	Large Weapon CDNL Noise Zone II: 62-70 CDNL dBC (Normally incompatible with noise-sensitive uses)	Large Weapon CDNL Noise Zone I: <62 CDNL dBC (Compatible with most noise-sensitive uses)	JBLM Firing Range Large Weapon PK15(met) Noise Zone: 115-130 dBP (Noise-sensitive uses are discouraged)	JBLM Firing Range Large Weapon PK15(met) Noise Zone: >130 dBP (Noise-sensitive uses are strongly discouraged)
All Residential	Incompatible	Incompatible	Conditionally compatible	Incompatible	Incompatible	Conditionally Compatible	Incompatible	Incompatible
Commercial	Conditionally compatible	Conditionally compatible	Compatible	Conditionally compatible	Conditionally compatible	Compatible	Conditionally compatible	Conditionally compatible
Industrial	Conditionally compatible	Conditionally compatible	Compatible	Conditionally compatible	Conditionally compatible	Compatible	Conditionally compatible	Conditionally compatible
Institutional /Public Use	Incompatible	Incompatible	Conditionally compatible	Incompatible	Incompatible	Conditionally Compatible	Incompatible	Incompatible

Source: This table summarizes land use compatibility guidance from several sources, including The Federal Interagency Committee on Urban Noise Guidelines for Considering Noise in Land Use Planning (FICUN 1980), the Land Use Compatibility Guidelines for APZs (DoD 1977), the Air Force Handbook 32- 7084 AICUZ Program Manager's Guide (DoD 1999), and Army Regulation 200-1 (DoD 2007).

Housing and certain uses such as health care, schools, churches, and public/institutional uses are generally the most sensitive to noise and safety risks and thus tend to raise the greatest compatibility concerns.

3.3. Compatibility Issues

Many factors can affect compatibility, as well as overall quality of life for an installation and surrounding areas. These factors may reflect specific impacts that result from the interaction of military operations and nearby land uses or broader social, economic, and environmental conditions that influence the health and well-being of residents, workers, and communities, including:

- Air Quality
- Alternative Energy Development (could produce glare, EMI, or tall structures)
- Antiterrorism/Force Protection (AT/FP)
- Bird or wildlife air strike hazards
- Competition for Airspace
- Drainage/Stormwater
- Dust
- Economic Development
- Frequency Spectrum
- Ground Transportation
- Growth Pressures/Future Development
- Historic or Cultural Sites
- Housing (lack of adequate off-base private rental housing)
- Infrastructure Capacity
- Interagency and Stakeholder Coordination
- Legislative Initiatives/Authority (either constrains the mission or limits the ability of local governments to manage growth)
- Light and Glare
- Noise
- Public Safety (safety of off-base housing)
- Public Trespassing/Perimeter Security
- Safety Zones (air)
- Safety Zones (training buffers)
- Threatened and Endangered Species (requires protection and could reduce training flexibility)
- Vertical Obstructions
- Vibration
- Water Quality

The consultant team narrowed the range of potential compatibility factors to a core set of issues for detailed study based on four primary sources: the 1992 Fort Lewis and McChord Air Force Base JLUS, the JBLM Growth Coordination Plan, the Request for Proposals (RFP) for preparing the current JLUS, and stakeholder and public engagement feedback provided as part of the current JLUS process. The primary issues identified by these sources are summarized below. While the JLUS focuses on these seven areas of compatibility, other factors, such as

housing adequacy remain significant challenges for JBLM and surrounding communities. The JLUS communication and coordination strategies will reinforce opportunities to address quality of life issues through ongoing regional initiatives, such as the South Sound Military & Communities Partnership (SSMCP).

Urban Growth

There is the potential for urban encroachment around JBLM, given current zoning designations and capacity for future growth. Area-wide growth potential near or within military impact areas, and smaller, geographically specific areas with known incompatibilities or potential incompatibilities are addressed in the compatibility analysis. Additional urban growth within the McChord Field north CZ should be prohibited, and urban growth should be directed away from high noise areas and APZs, where feasible. Within the APZs, jurisdictions should explore options for phasing out incompatible land uses through property acquisition, incremental zoning changes, or siting decisions regarding incompatible public uses like schools or hospitals.

Aircraft Safety

There is a statistical possibility of aircraft accidents in the McChord Field CZ and APZs. Existing development in these areas poses safety risks to people and property, and challenges JBLM's ability to conduct training activities and operations. The presence of incompatible land uses in the CZ and APZs is the most critical encroachment issue from the perspective of the military. The resolution of this issue in a way that minimizes the presence of incompatible land uses will have a significant effect on the long-term viability of JBLM and its power projection and training missions.

Military Operational Noise

Noise from aircraft operations, artillery firing, and other JBLM training activities and operations affects surrounding communities and creates the risk of noise complaints. Civilian nuisance complaints can cause military capabilities to erode over time.

Threatened and Endangered Species

There are federally listed threatened and endangered prairie species and habitat on and around JBLM. Listed species requirements limit the scope of training on JBLM training lands.

Transportation

The I-5 corridor is the primary transportation artery in the region. Traffic circulation and access around the I-5 corridor have been an increasing challenge as both JBLM and surrounding communities have grown over recent years. Transportation issues are being jointly addressed on a regional level by state, military, regional, and local jurisdictions.

Trespass and Unauthorized Access to JBLM Range and Training Lands

Unauthorized recreational use, trespass, and nuisance uses such as illegal dumping, shooting, and off-road vehicle use create safety risks to civilians and JBLM personnel and interfere with

military training. JBLM currently operates a program that authorizes specific types of recreational use of rangelands on specific days and times.

Communication and Coordination

JBLM and surrounding communities have a history of communication and coordination that is important to maintain and enhance.

Lack of Adequate Off-Base Private Rental Housing

JBLM has identified the lack of adequate off-base rental housing for servicemembers as a significant issue. Approximately 70% of JBLM servicemembers live off base. The DoD follows criteria for what is considered adequate private rental housing for servicemembers that take into account factors such as cost, unit square footage, and number of bedrooms. Servicemember rank and family status (i.e., single, married, with children) affect the acceptable ranges for these criteria. Other criteria, such as crime rates affects the adequacy of private rental housing. Given recent decreases in rental availability due to increasing occupancy rates, a significant increase in rental costs, and a rise in crime rates in some areas, the supply of private rental housing DoD deems adequate has decreased and is not sufficient to serve the number of servicemembers in need of such housing.

JBLM is in the process of updating a Housing Market Analysis (HMA), expected to be released in 2015. Regional stakeholders should work with JBLM to address the conclusion of the HMA and identify ways to increase the supply of housing and decrease crime rates in order to provide a more suitable market for rental housing that meets the needs of servicemembers.

3.4. Military Areas of Influence

Military areas of influence are defined by federal guidelines and reflect the results of technical modeling to demonstrate noise and air safety risks associated with military operations. The 2014 Draft JBLM AICUZ Study identifies military influence areas associated with aircraft operations, and the 2014 Draft JBLM Installation Operational Noise Management Plan (IONMP) identifies military influence areas associated with noise-generating operations¹. Certain military influence areas extend off base and into the surrounding communities, and were considered as part of this analysis. They are listed below and described in greater detail in Section 4.2.

- North CZ and APZs for McChord Field
- Imaginary surfaces for McChord Field
- Military training routes (MTRs)
- Noise zones for McChord Field
- Noise zones for large weapons firing activities at JBLM ranges

¹ This Land Use Compatibility Analysis contains data from the 2014 Draft JBLM AICUZ Study and the 2014 Draft JBLM Installation Operational Noise Management Plan (IONMP). Both of these documents are in draft form, pending the completion of an Environmental Assessment. These data should therefore not be considered final at this time.

- Noise zones for large weapons “single-event” firing activities at JBLM ranges

The evaluation of land use compatibility in all of the military areas of influence, except for the airfield imaginary surfaces (defined in Section 4.2.1) and MTRs, utilized GIS analysis, zoning data, and the classifications shown in Tables 1 and 2, which reflect suggested federal land use compatibility guidelines². The analysis overlaid existing zoning data for surrounding communities with noise contours and air safety zones. The planning team collapsed detailed zoning classifications into the broader use categories shown in Tables 1 and 2. The analysis then assigned one of three designations to parcels of land based on the overlap of zoning type and guidance:

- **Incompatible:** Use is not recommended based on compatibility guidance; the impacts are significant enough that mitigation may not be effective. (Designated in **red** on Tables 1 and 2.)
- **Conditionally Compatible:** Some actions to mitigate impacts may be warranted, such as sound attenuation or real estate disclosures. (Designated in **yellow** on Tables 1 and 2.)
- **Compatible:** Use does not trigger any compatibility concerns; no action is required. (Designated in **green** on Tables 1 and 2.)

The results of this analysis demonstrate where current zoning regulations ensure compatible land uses. However, there are several specific areas where existing legal non-conforming land uses are incompatible, despite being located in a compatible zoning designation. These specific areas are described in the analysis below.

A different method was used for imaginary surface areas and flight training routes. This method relied on conversations with local stakeholders to identify known compatibility issues.

² Tables 1 and 2 are based on suggested federal guidance from the Federal Interagency Committee on Urban Noise Guidelines for Considering Noise in Land Use Planning (FICUN 1980), the Land Use Compatibility Guidelines for APZs (DoD 1977), The Air Force Handbook 32-7084 AICUZ Program Manager’s Guide (DoD 1999), and Army Regulation 200-1 (DoD 2007).

4. Analysis

4.1. Urban Growth

Existing land use patterns in the JLUS study area are varied. The northern portion of JBLM is next to the edge of Pierce County's urban growth boundary; lands within this boundary are intended for urban development. The northern and northwestern edges of the base are adjacent to the cities of Lakewood, Steilacoom, and DuPont. The City of Tacoma, one of the state's largest cities, is just north of the base. The northeastern edge of the base is adjacent to an area of unincorporated Pierce County that is developed with urban land use patterns including a mix of residential and commercial uses. For these reasons, land use patterns in the northern part of the JLUS study area are urban in nature.

Other places within the JLUS study area with urban land use patterns include the urban growth areas containing the cities of Roy, Yelm, Rainier, and Lacey; and the Nisqually Indian Reservation. Roy and Yelm touch the southern border of the base. Roy is in a Pierce County urban growth area, and Yelm is in a Thurston County urban growth area. Rainier is located to the south of the base, and Lacey is located to the west of the base. Both cities are in Thurston County urban growth areas; neither touches the base boundary, but they are close. The Nisqually Indian Reservation straddles the western border of JBLM. The Tribal lands outside of JBLM include some urban development.

The eastern portion of the JLUS study area is outside of urban growth areas and Tribal lands. This includes unincorporated portions of Pierce County, including the unincorporated urban areas of Parkland and Spanaway. In general, it has lower levels of development and less intensive types of land uses. Land uses include vacant and undeveloped land, resource lands used for agriculture and forestry, low-density residential and commercial uses, and industrial uses. The Nisqually National Wildlife Refuge is located on the western edge of the base, and is protected from future development.

4.1.1. Approach

Urban growth in general can pose a threat to military capabilities when it occurs near an installation in areas where there may be operational impacts, such as noise or accident potential. More urban development will increase the likelihood of land uses that are categorized as incompatible with safety or noise zones, which may place pressure on the installation to limit or modify training and operations in such a way that overall capabilities are reduced. Urban growth on land adjacent to military training lands may impact training operations more directly, such as by producing light pollution or increasing the potential for trespass or unauthorized access to training lands. Therefore, part of the compatibility analysis is to examine where future growth may occur and identify those areas of potential growth that are adjacent to the installation or that may be affected by noise or other impacts from the installation.

The methodology for evaluating land use compatibility in the JLUS study area used Buildable Lands data supplied by Pierce County and TRPC and GIS analysis to identify areas around JBLM where urban growth could occur in the next 20 years, and whether growth in those areas could pose any future compatibility issues.

Under the State of Washington's Growth Management Act (GMA), Pierce and Thurston counties are required to participate in the Buildable Lands Program and develop data that show the estimated capacity of lands within the county to accommodate housing and employment growth. The processes used to estimate capacity account for such factors as whether lands are vacant or underutilized, and current zoning designations. The purpose of the Buildable Lands data is not to project growth or prescribe where growth should occur, but to identify areas with the capacity to accommodate future housing and employment uses. The data are a forecasting tool that help to predict where growth may occur. The data have certain limitations since factors other than capacity, including market attractiveness, may influence the timing and nature of development. The data are used here to identify areas with development potential that may present compatibility issues, should they develop.

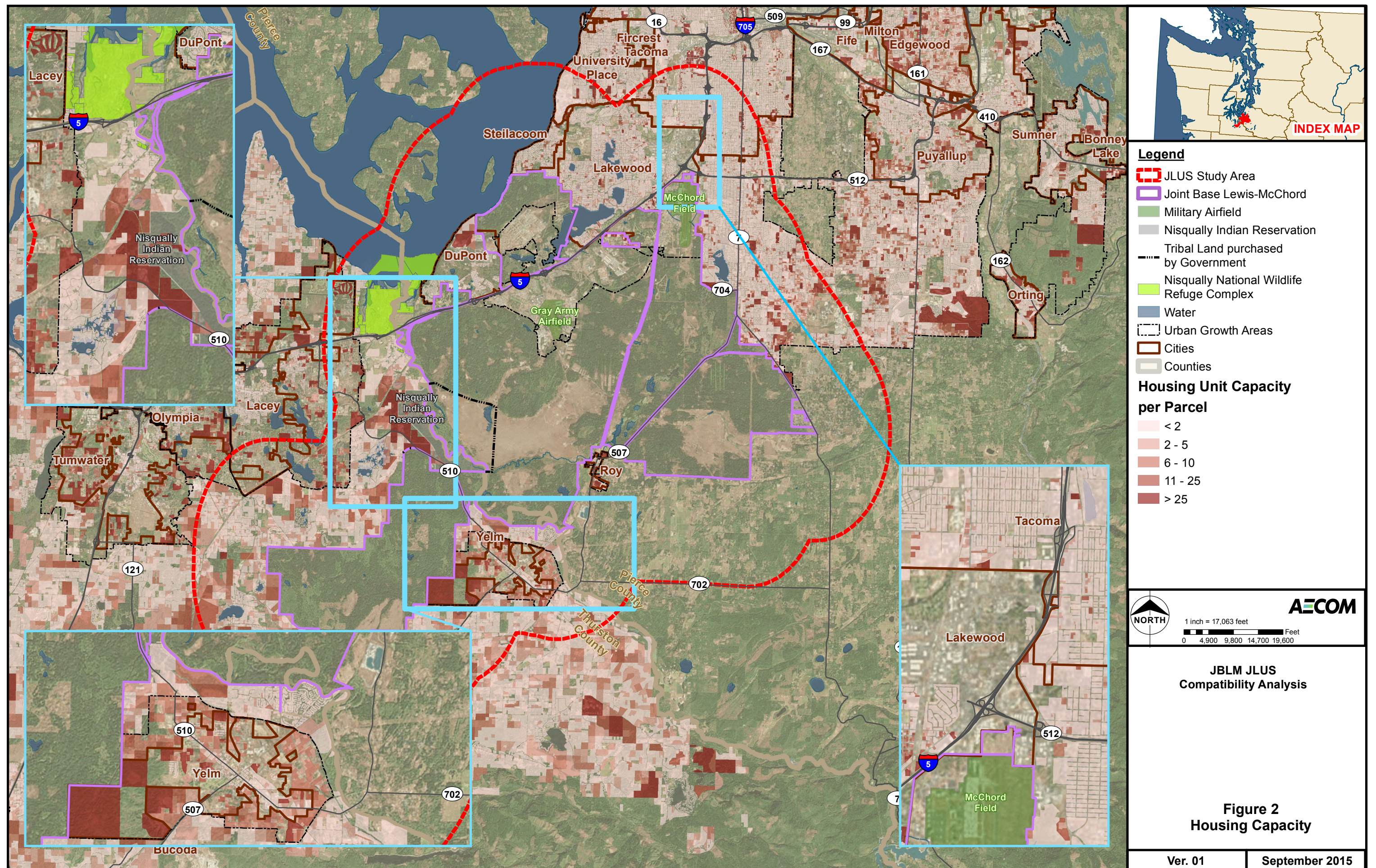
The analysis identified areas around JBLM with significant housing and employment capacity as areas with potential for compatibility issues. Areas with significant housing capacity include Yelm, the Nisqually Indian Reservation, and DuPont. Significant employment capacity exists in Yelm and the Nisqually Indian Reservation. When more people are exposed to the impacts of military training and operations, this increases the risk of nuisance and subsequent complaints from the public, which in turn threatens the erosion of JBLM's military capabilities.

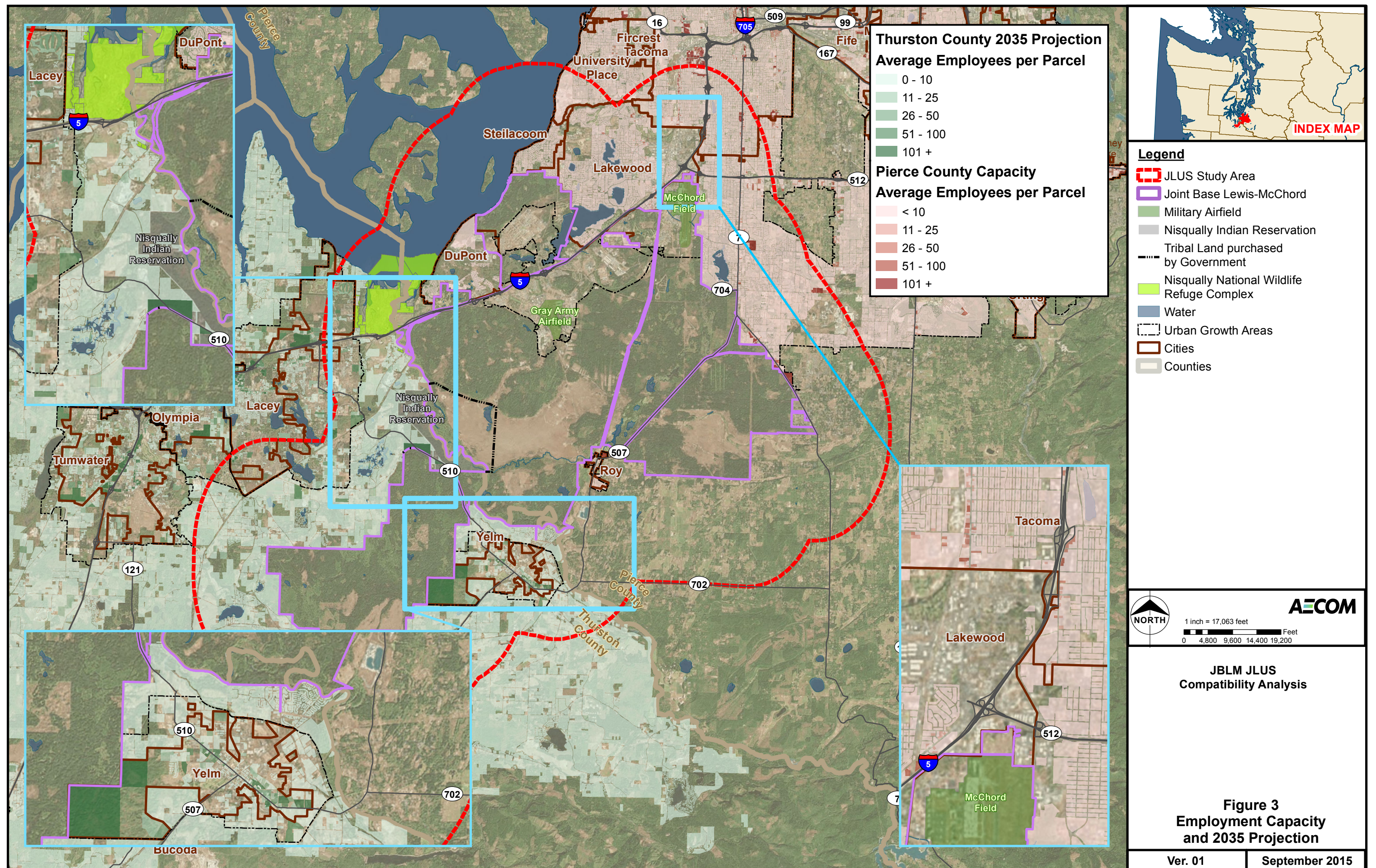
4.1.2. Findings

Figures 2 and 3 show the projected capacity for new housing units and new jobs around JBLM in the next 20 years. Places within the JLUS study area with high capacity for both housing and employment include the areas around Roy and Yelm and the area of unincorporated Pierce County around State Route 7. Additionally, parts of the City of DuPont have significant capacity for residential growth. The area between Lacey and the Nisqually Indian Reservation, within the Lacey UGA also has some housing development capacity. About 950 acres of agricultural land in this vicinity, outside of the UGA, will remain in agricultural use and not be converted to urban development due to the purchase of development rights by Thurston County. The area of unincorporated Thurston County to the northwest of the Yelm city limits, adjacent to JBLM training lands is zoned UR (Urban Reserve) 1/5. While current allowed land uses are low density rural residential, agriculture, forestry, and conservation, the intention is that this area may accommodate future urban growth. Given its proximity to JBLM training lands, this area could represent future compatibility concerns, depending on the land uses and density allowed and development standards applied.

These areas have the potential for future compatibility issues, depending on how they develop and how military and training operations are conducted on the base in coming years. Current military operations provide a useful indication of the areas around the base that are likely to

experience noise and other impacts in the future. These areas are described in the following sections.





4.1.3. Site-Specific Areas of Concern

Two specific sites adjacent to the base were identified during the existing conditions analysis as having the potential to hold incompatible land uses in the future, given their potential for significant future growth. The sites were a proposed master planned community in the City of Yelm, and a proposed mine redevelopment in the City of DuPont.

Thurston Highlands Master Planned Community

The southwest portion of the City of Yelm is currently undeveloped and abuts the heavily used Rainier Training Area in the southwestern part of JBLM. This area is currently zoned for a master planned community known as the Thurston Highlands (see Figure 4). The master plan includes 5,000 homes, commercial and retail space, open space, a regional sports complex, and schools. Locating sensitive receptors such as suburban housing areas next to military training areas may lead to noise complaints.

The potential for development of the Thurston Highlands Master Planned Community represents an encroachment threat to JBLM, given its location near critical training land. As shown on Figures 2 and 3, Thurston Highlands has the potential for significant housing and job growth. A portion of it is within the C-weighted Day-Night Level (CDNL) noise zones, and is shown to be conditionally compatible. Conceptual land use plans propose residential uses and some higher densities in the northern portion of the site, in areas affected by the CDNL noise contours.

A Final Environmental Impact Statement (FEIS) was published in 2008 for the Thurston Highlands (R.W. Thorpe & Associates, Inc. 2008). The FEIS studied potential impacts such as noise and light from military operations on residents. It found that these could be mitigated and that no significant unavoidable adverse impacts were identified that would affect compatibility between the proposed master planned community and JBLM. However the Thurston Highlands project has the potential to negatively affect training operations due to its immediate proximity to important training land. Urban development at the scale and intensity envisioned for Thurston Highlands has the potential to introduce light pollution that may affect training operations and would increase the potential for trespass or unauthorized access to training lands.

The development has not moved forward since publication of the FEIS, due to economic challenges posed by the recession and due to a lack of sufficient water rights to support this level of urban growth in Yelm. This affords the opportunity to work with the City of Yelm to review the potential impacts of the master planned community on the military training and operations, encourage the redesign of the community to locate sensitive uses away from noise zones, and identify additional mitigation strategies. Potential site design strategies include locating open space and commercial uses and limiting residential uses in those portions of the site affected by the CDNL Noise Zone 1.

CalPortland Mine Reclamation and Future Use

The CalPortland gravel mine in the City of DuPont contains an active gravel mining area that abuts the base in the Lewis North area (the portion of JBLM that is adjacent to DuPont, north of I-5). A second area of active mining near Greene Park is close to the base, but not directly adjacent. These two areas are identified as future residential uses on the DuPont Future Land Use Map (City of DuPont 2011)(see Figure 5). The first is identified as Residential Reserve. This land is designated as a reserve to be developed if and when the City needs additional land to accommodate future growth. The second area is identified as R4, single family residential development.

The Buildable Lands data reflect these zoning designations, showing high capacity for housing growth in the City (Figure 2). Conversations with City staff indicated that the lands are likely to continue in mining use for 10 years or more, and that the City and community have no concerns about land use compatibility with JBLM or these areas. The lands, although adjacent to JBLM lands, are not located within any military areas of influence. Noise contours associated with firing ranges on Lewis North do not extend beyond the installation boundaries.

4.2. Aircraft Safety

Clear Zones (CZ) and Accident Potential Zones (APZs) are areas where the potential for aircraft accidents has been identified through the Air Installation Compatible Use Zone (AICUZ) program. The CZ is a 3,000 by 3,000 foot zone at the end of the runway where there is the highest statistical possibility of aircraft accidents. Any existing or future development in the CZ is of concern. Development in the CZ increases the likelihood of flight obstructions such as physical structures, smoke, and glare, and challenges the military's ability to safely carry out missions. Development should be prohibited in this zone. Any use other than airfield infrastructure (e.g., approach lighting) is incompatible in the CZ.

The APZ I designation has somewhat lower accident potential than the CZ, but it is high enough that most types of development in this zone are discouraged, including residential uses. The APZ II designation has a lower accident potential, and some compatible uses are appropriate; however, uses that concentrate people in the APZ II, including residential uses at densities greater than 2 dwelling units per acre, are considered incompatible per federal guidance. It should be noted that the 1992 Fort Lewis and McChord AFB JLUS did not define "low density" residential uses. Local jurisdictions have defined low density residential to include densities up to 6 dwelling units per acre. The analysis and mapping contained here uses the federal guideline of 2 dwelling units per acre with the understanding that local existing conditions may justify allowing greater range of residential densities within the APZs.

Figure 6 shows the north CZ and APZs for McChord Field and whether zoning designations within these zones are compatible, conditionally compatible, or incompatible. Figure 6 also includes an overlay showing existing uses that are known to be incompatible with military

activities. Land use categorized as incompatible in the CZ and APZs is of high concern, due to the risks to both civilians and military personnel related to aircraft crashes.

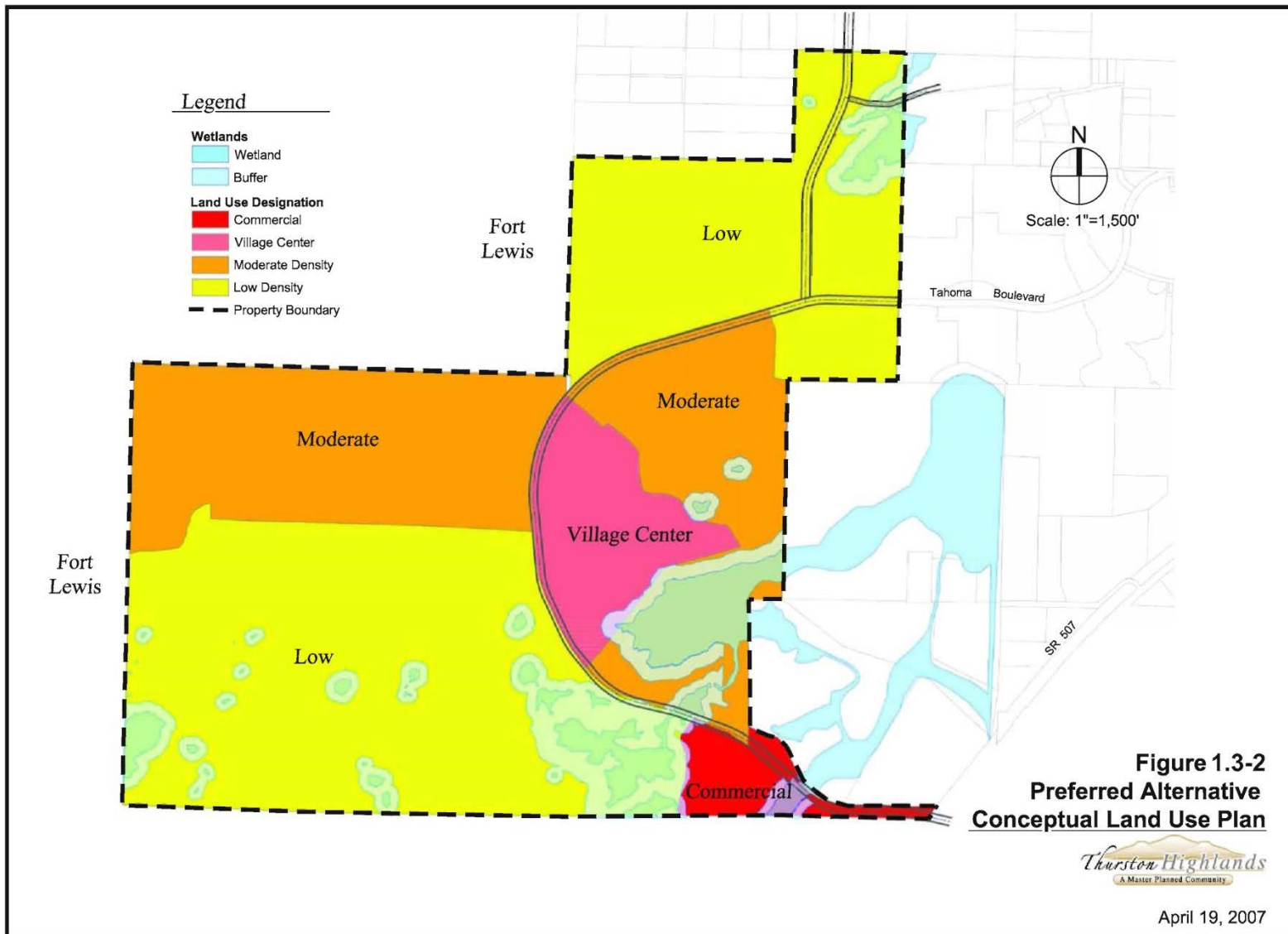


Figure 4: Thurston Highlands Master Planned Community
(reproduced from the Thurston Highlands FEIS, 2008)

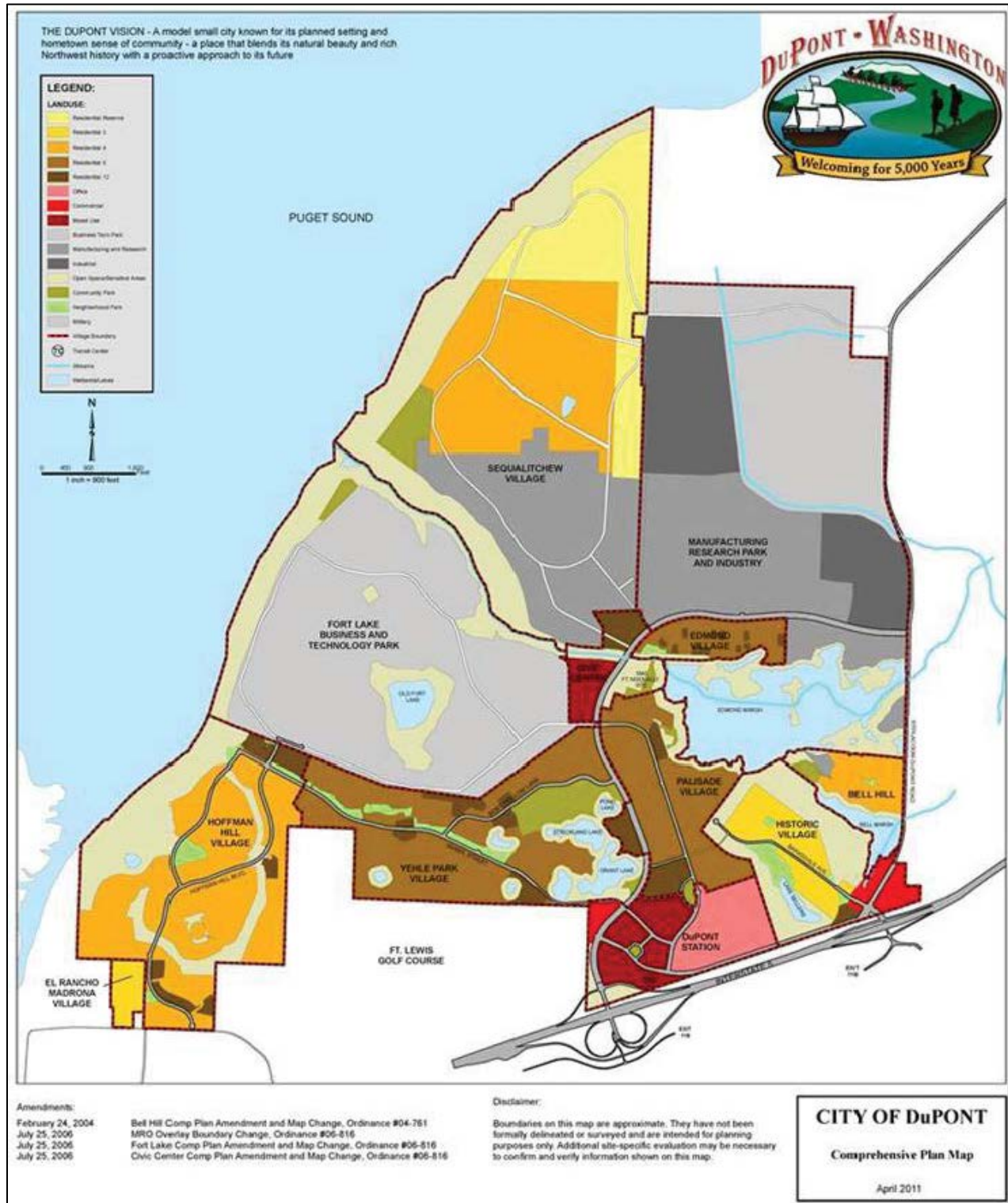
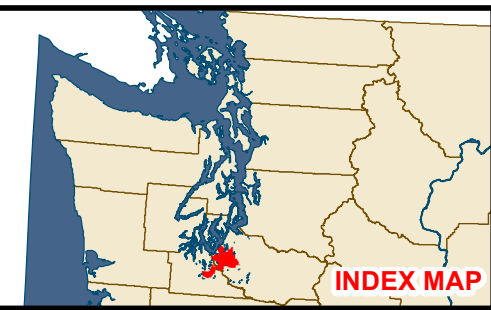
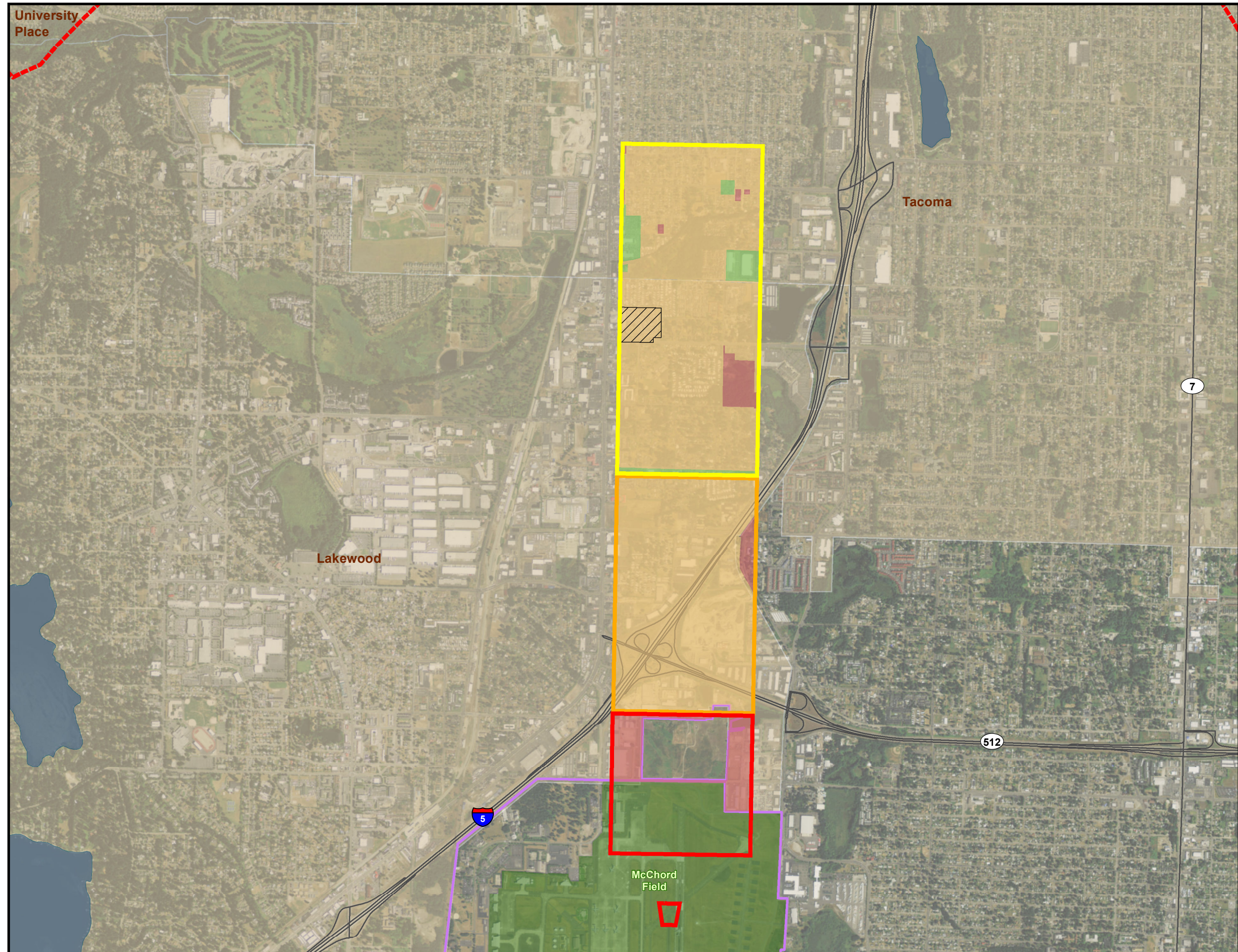



Figure 5: City of DuPont Future Land Use Map
(Reproduced from the DuPont Comprehensive Plan, 2011)




- Legend**
- JLUS Study Area
 - Joint Base Lewis-McChord
 - Military Airfield
 - Urban Growth Areas
 - Cities
 - Counties
 - Air Accident Zones**
 - APZ I
 - APZ II
 - CZ
 - Land Use Compatibility**
 - Compatible
 - Conditionally Compatible
 - Incompatible
 - Non-conforming Incompatible Use Area



NORTH

1 inch = 2,000 feet

0 570 1,140 1,710 2,280 Feet

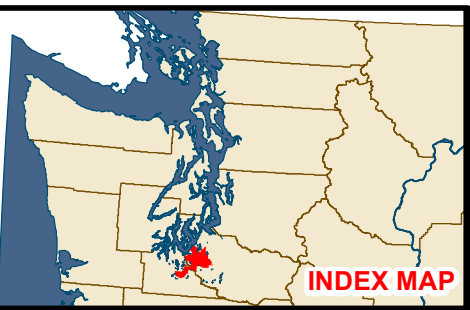
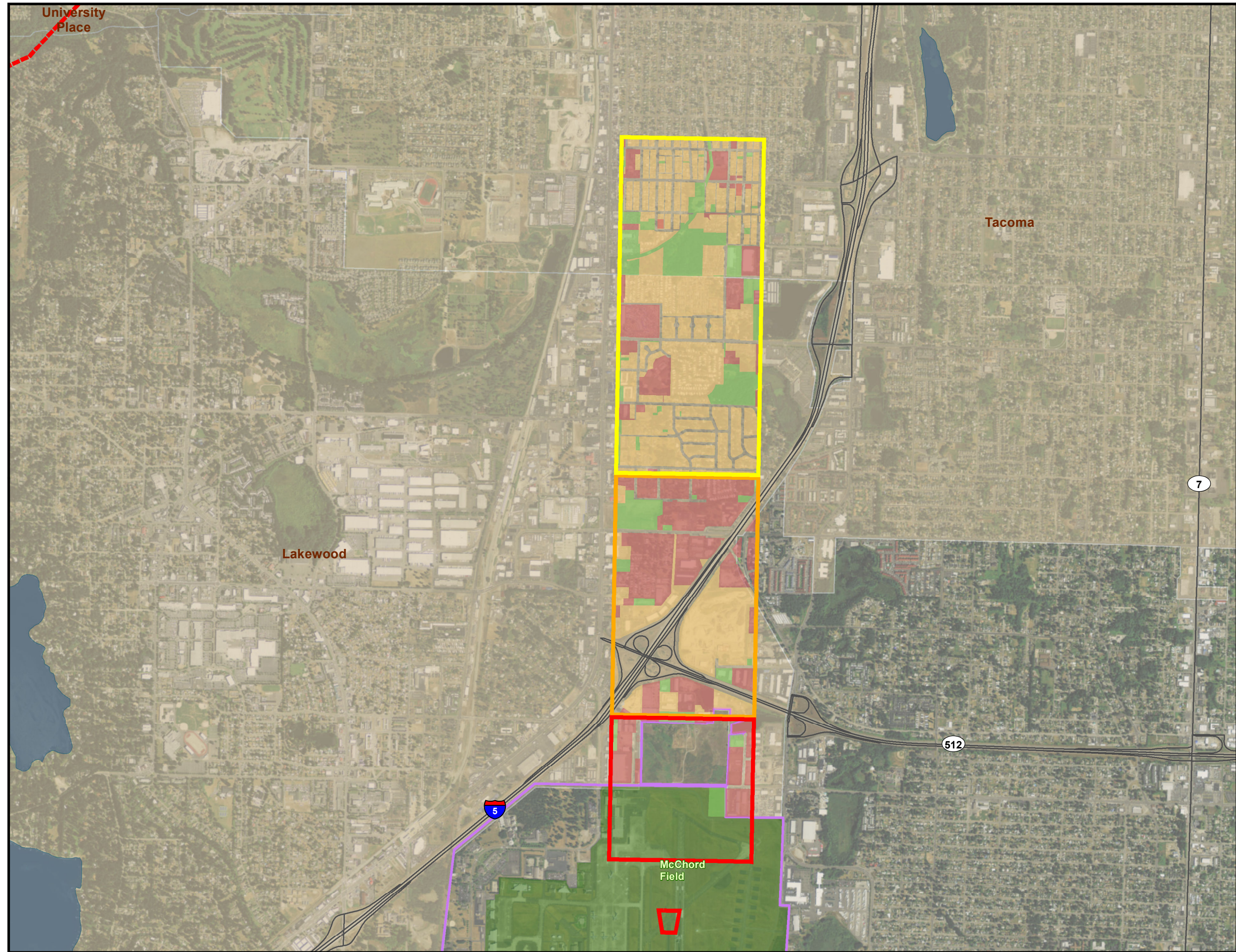


**JBLM JLUS
Compatibility Analysis**


**Figure 6
Zoning Compatibility in
McChord Field North Clear Zone
and Accident Potential Zones**

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September 2015

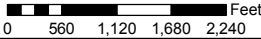


- Legend**
- JLUS Study Area
 - Joint Base Lewis-McChord
 - Military Airfield
 - Urban Growth Areas
 - Cities
 - Counties
 - Air Accident Zones**
 - APZ I
 - APZ II
 - CZ
 - Land Use Compatibility**
 - Compatible
 - Conditionally Compatible
 - Incompatible




NORTH

1 inch = 1,963 feet



0 560 1,120 1,680 2,240 Feet



JBLM JLUS
Compatibility Analysis

Figure 7
Land Use Compatibility in
McChord Field North Clear Zone
and Accident Potential Zones

Of greatest concern is the presence of incompatible land uses in the CZ. There are existing uses on the western and eastern edges of the CZ that are incompatible, including industrial uses and storage condominium units (individual, privately owned storage units). The majority of these uses are nonconforming uses built before the City of Lakewood adopted a Clear Zone zoning designation in 2001. The Clear Zone zoning designation which prohibits most uses; however, it allows for established non-conforming uses to continue and allows for the potential development of some new land uses. As noted above, any land uses other than airfield infrastructure is incompatible in the CZ.

A small area of land within the City of Lakewood along the western edge of the CZ is zoned industrial. This zoning is incompatible with the CZ. One other issue of concern for the CZ is the presence of two adjacent industrial uses, also within the City of Lakewood, that emit steam plumes located at Steele Street S and 112th Street S, and on the east side of I-5 just north of State Route 512. While not located inside the CZ, these uses could pose aviation hazards.

The presence of incompatible land uses within the CZ is the most critical encroachment issue facing JBLM. All incompatible land uses should be removed from the CZ through, zoning and property acquisition from willing sellers. As noted earlier, JBLM should seek funding from federal, state, and local sources to resume prior property acquisition efforts.

Within APZ I and APZ II, all existing uses and zoning designations are categorized as either conditionally compatible or incompatible.

In APZ II, the Star Lite Swap Meet, located in the City of Lakewood, is a popular weekend destination for the public. There are areas zoned by the City of Tacoma for residential uses and by the City of Lakewood for recreational uses. These existing uses and zoning designations allow for concentrations of people, which increases the safety risks associated with APZ II.

The majority of APZ I and II within the City of Lakewood falls within either the Air Corridor 1 (AC1) or Air Corridor 2 (AC2) zoning designations. These zoning designations were adopted to ensure that future development is compatible with JBLM air operations and contain limits on intensity and development standards such as noise attenuation requirements and prohibitions on uses that emit smoke or dust that would interfere with aircraft operations. These development standards would ensure that land uses listed as conditionally compatible in Table 1 would be developed in a way that is compatible. However, both the AC1 and AC2 zoning designations allow for the continuation of non-conforming uses and allow certain other uses, including some residential uses to continue. Residential uses are not categorized as compatible in APZ I and categorized as compatible in APZ II only at densities less than 2 dwelling units per acre.

Within the City of Tacoma, uses generally categorized as conditionally compatible exist in APZ II, including residential uses at densities over 2 dwelling units per acre. Incompatible uses include several small instances of medium density residential uses (i.e. three duplexes, one 8-plex, and three 6-plexes). Arlington Elementary School, located within a single-family residential zone, is

a use generally categorized as incompatible in APZ II. Tacoma encourages the use of noise reduction techniques to mitigate impacts of aircraft noise and encourages lower density development in APZs. While existing residential development can be expected to continue, “upzoning” that would increase residential densities should be avoided in both APZs. Incremental zoning changes that avoid increasing incompatible land uses should be employed. Local jurisdictions should also seek other ways to remove incompatible uses from the APZs, such as property acquisition, where feasible, and conversion of this property to compatible uses such as open space. Future siting decisions for incompatible public uses, such as schools or hospitals, should avoid siting these uses within the APZs.

Accessory Dwelling Units in Lakewood

The issue of Accessory Dwelling Units (ADUs) in APZ I and II was raised by the TWG. Discussion focused on acknowledgement of the issue and whether any action is needed in the JLUS. The issue relates to whether the additional population density that could potentially result from the development of additional ADUs within the APZs would be a cause for concern, given compatibility criteria that discourage high concentrations of people within the APZs. Discussion with Lakewood planning staff provided the following information.

ADUs are currently allowed under the City of Lakewood zoning code in both APZs I and II as accessory uses to single-family residences. Existing single-family development in these areas is allowed as a pre-existing use. While no new single-family residential development can be built, ADUs have been authorized since 2000. ADUs do not require a permit although they are required to be recorded on deeds.

Lakewood considers the ADUs in these areas to be a minor concern given that they are located in stable single-family neighborhoods that are unlikely to convert to industrial or other uses any time soon. So while additional residential development within APZ I should be discouraged, the potential for significant residential growth resulting from the development of ADUs is low.

Home-based daycare facilities, also permitted as an accessory use in existing single-family areas, are of more concern. The City of Lakewood, in conjunction with the Department of Social and Health Services (DSHS) (which licenses home-based daycares), has denied permits for home-based daycares in APZ I and II based on safety concerns.

Lakewood staff did not see any potential expansion or intensification of ADUs or home-based daycare facilities in APZ I and II. However, any increase in density of residential uses or daycare facilities in the APZs would not be compatible with the compatibility guidance cited in this report and should be discouraged.

4.2.1. Imaginary Surfaces

Guidance on height limitations related to the imaginary surfaces is provided by 14 Code of Federal Regulations (CFR) 77.28 and UFC 3-260-01. Height restrictions of man-made structures are necessary to ensure that no object interferes with the safe operation of aircraft at military

installations. Imaginary surfaces consisting of horizontal and transitional planes are defined to ensure that land development within the imaginary surfaces does not result in aviation hazards. PART 77 further specifies notification requirements for the construction or alteration of objects that are higher than 200 feet AGL above ground level or exceed an imaginary surface. Based upon the notice received, the FAA determines if the proposed action poses a hazard to air navigation and if any mitigation recommendations, such as marking and lighting can reduce the safety risk. The FAA also notifies the aviation community of the construction or alteration of objects that affect the navigable airspace, including the revision of charts.

The imaginary surfaces surrounding an airfield represent areas that are sensitive to navigational risks. Objects such as trees or towers that protrude through or above imaginary surfaces can interfere with safe aircraft operations. The surfaces rise at varying slopes from the runway so that objects may increase in height farther from the airfield without posing an obstruction.

Imaginary surfaces include:

- **Inner horizontal surface.** An oval plane that is at a height of 150 feet above the airfield.
- **Conical surface.** A surface extending from the periphery of the inner horizontal surface outward and upward at a slope of 20:1 for a horizontal distance of 7,000 feet to a height of 500 feet above the airfield.
- **Outer horizontal surface.** A plane that is 500 feet above the airfield, extending outward from the outer periphery of the conical surface for a horizontal distance of 30,000 feet.
- **Primary surface.** A surface located on the ground, longitudinally centered on each runway, and the same length as the runway. The width of the primary surface for runways is 2,000 feet.
- **Clear-zone surface.** A surface located on the ground at each end of the primary surface. The clear-zone surface is 1,000 feet long and is the same width as the primary surface.
- **Approach/departure-clearance surface.** An inclined plane that is located symmetrical from the extended runway's centerline, beginning 200 feet beyond each end of the primary surface at the centerline elevation of the runway's end and extending for 50,000 feet. The slope of the approach-clearance surface is 50:1 along the extended runway's centerline until it reaches an elevation of 500 feet above the established airport elevation. The surface then continues horizontally at this elevation to a point 50,000 feet from the beginning point. The width of this surface at the runway's end is the same as the primary surface, then it flares uniformly and the width at 50,000 feet is 16,000 feet.
- **Transitional surfaces.** These surfaces connect the primary surfaces, the first 200 feet of the clear-zone surfaces, and the approach/departure-clearance surfaces to the inner horizontal surface, the conical surface, the outer horizontal surface, or other transitional surfaces. The slope of the transitional surface is 7:1 outward and upward at right angles to the runway's centerline.

Figure 8 shows imaginary surfaces for McChord Field. Height restrictions associated with imaginary surfaces related to the runway were addressed through the CZ and APZ analysis. The lowest remaining imaginary shape is the Inner Horizontal Surface, at 150 feet above ground level. Cell towers can reach up to 200 feet, and are often mounted on the top of existing structures. As such, applications for new cell towers in the Inner Horizontal Surface are an issue of potential concern. JBLM has established relationships with Pierce County and City of Lakewood staff and received notification of proposed new towers. The information is forwarded to the Directorate of Plans, Training, Mobilization, and Security (DPTMS). This relationship should be formalized and strengthened by establishing height restrictions related to aircraft imaginary surfaces.

There are also six existing warehouses, trees, and a flagpole that penetrate the imaginary surfaces. JBLM has surveyed and continues to monitor trees within the vicinity of McChord Field. Cooperative efforts with landowners to manage trees by trimming or planting low growing species should be encouraged.

4.2.2. Military Training Routes

Military Training Routes (MTRs) are aerial corridors that accommodate low-level military aircraft operations (Figure 8). Land uses in areas below MTRs could be exposed to noise from low-flying aircraft such as helicopters. Aircraft flying in the MTRs could be vulnerable to navigational hazards such as tall structures, smoke or glare.

The flight training routes are shown in Figure 7. Past feedback from community members living and working around JBLM indicated low-flying aircraft resulted in noise impacts to surrounding communities. JBLM is working with local communities to improve communications about training activities to reduce the number of noise complaints. Previous community concerns related to helicopter noise have largely been resolved by JBLM through the designation of helicopter flight routes that avoid sensitive residential areas.

4.3. Military Operational Noise

Federal guidelines establish zones for levels of noise generated by different types of military activities, such as aircraft operations and weapons firing, and the types of land uses that are compatible in these zones. The noises for these different types of activities are perceived differently by the human ear, and for this reason are measured using different decibel scales. For instance, weapons training activities generate sounds with high levels of acoustic energy, similar to a clap of thunder, gunshot, or explosion. Residents in nearby communities can both feel and hear this type of sound.

The 2014 Draft JBLM IONMP provides the following summary of relevant noise metrics:

- **A-weighted Scale (dBA)** – The human ear cannot perceive all pitches or frequencies equally well. Reflecting this fact, measures can be adjusted, or weighted, to compensate

for the human lack of sensitivity to low-pitched and high-pitched sounds. This adjusted measurement unit is known as the A-weighted decibel, or dBA. The dBA is used to evaluate noise from transportation activities (traffic and aircraft).

- **C-weighted Scale (dBC)** – The C-weighted scale measures more of the low-frequency components of noise than does the A-weighted scale. This unit, symbolized as dBC, is used for evaluating impulse noise and vibrations generated by heavy weapons such as artillery, mortars, armor (20 mm or greater), and explosive charges.
- **Peak Sound Level (PK15)** – The peak sound level in a flat-weighted scale can be used to measure noise from small-arms (less than or equal to 20 mm) firing, heavy artillery, and explosives.
- **Day-Night Sound Level (DNL)** – The day-night average sound level is useful to account for the difference in response to noises that occur during sleeping hours as compared to waking hours. This indicator is defined as the average sound level in decibels during a 24-hour period, with a 10-dB weighting (penalty) applied to nighttime sound levels. The 10-dB nighttime weighting accounts for the fact that noises at night sound louder because there are usually fewer noises occurring at that time.

It should be noted that noise levels in one scale cannot be added or compared mathematically to levels in another scale.

In the zones for the loudest noise levels, most land uses are discouraged because there is a high probability that people living and working in these areas will complain about noise, which challenges the ability of military installations to carry out missions. In zones for lower noise levels, a variety of land uses may be compatible.

Noise zones for the McChord Field and large weapons firing activities at JBLM ranges were considered as part of the land use analysis. The decibel levels for each zone are shown in Table 3. The land use compatibility guidelines for each zone are summarized in Table 2. There are two different types of noise zones for large weapons firing. The Large Weapon C-weighted Day-Night Level (CDNL) Noise Zones are for regular firing activities, and the Large Weapon PK15 (peak noise level) Noise Zones are for “single events.” Single events occur when significant noise is generated from a single impulse blast. Table 4 contains comparative examples of noise levels, to provide context for the noise zones shown in Table 3. Noise zones for firing ranges at Lewis North were considered for this analysis; however they were not included because they do not extend beyond the borders of JBLM.

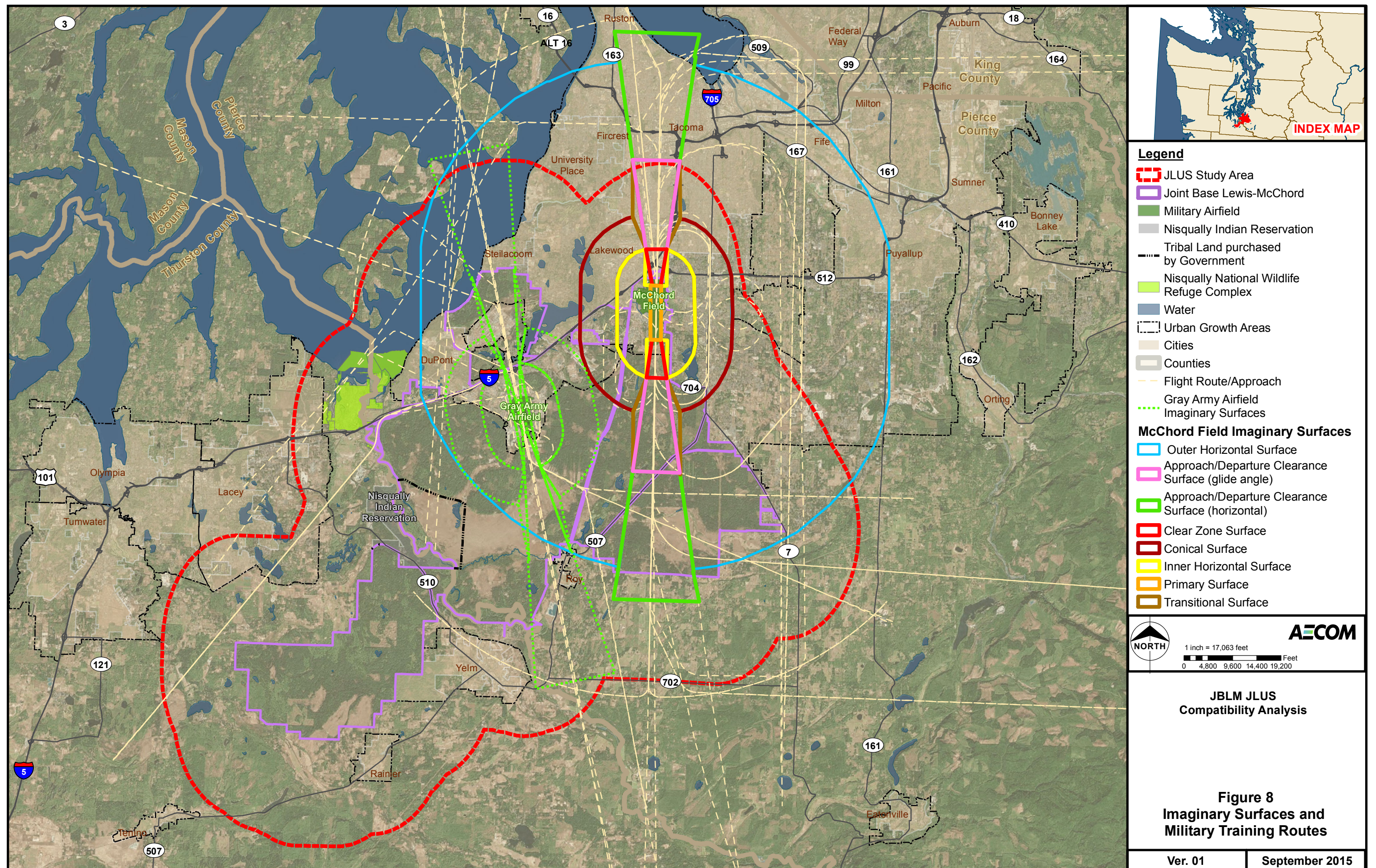


Table 3. Noise Zones

Noise Zones	Sound Level
<i>Aircraft Noise Zones</i>	
Noise Zone II	>75 DNL dBA
Noise Zone II	65-75 DNL dBA
Noise Zone I	<65 DNL dBA
<i>Large Weapon CDNL Noise Zones for JBLM Firing Ranges</i>	
Noise Zone III	>70 CDNL dBC
Noise Zone II	62-70 CDNL dBC
Noise Zone I	<62 CDNL dBC
<i>Large Weapon PK15 Noise Zones for JBLM Firing Ranges</i>	
PK 15(met)	>130 dBP
PK 15(met)	115-130 dBP

Table 4. Noise Level Comparative Examples.

Noise Source	Decibel Level (dB)	Effect to the Unprotected Ear
Jet take-off (at 25 meters)	150	Eardrum rupture
Chainsaw	120	Painful
Live rock music	110	Average human pain threshold
Motorcycle	100	Hearing damage possible after 8 hours of exposure
Vacuum Cleaner	70	Annoyingly loud
Quiet suburban neighborhood	50	Quiet, one-fourth as loud as 70 dB
Quiet rural area	30	Quiet, one-sixteenth as loud at 70 dB

Sources: Temple University 2015; Federal Interagency Committee on Noise 1992.

4.3.1. Aircraft Noise Zones for McChord Field

Figures 9 and 10 shows the aircraft noise zones for McChord Field³, and whether zoning designations or existing land use within the noise zones are compatible, conditionally compatible, or incompatible. There are a few small areas in Lakewood and Tacoma that are incompatible. Uses in these areas include residential, mixed use, and recreation. People in these areas may complain about exposure to high levels of noise.

Other City of Lakewood, City of Tacoma, and Pierce County zoning designations within the aircraft noise zones for McChord Field are either conditionally compatible or compatible. Future growth in these areas will be consistent with zoning designations, and as such will likely not result in any compatibility issues with JBLM that cannot be mitigated.

³ Based on draft data contained in the 2014 Draft JBLM AICUZ Study.

4.3.2. Large Weapon CDNL Noise Zones for JBLM Firing Ranges

Figures 11 and 12 shows the Large Weapon CDNL Noise Zones for JBLM firing ranges⁴ and zoning or existing land use compatibility. There are large areas of land with incompatible zoning, including most of the City of Roy, most of the Nisqually Indian Reservation, and unincorporated Pierce County. These areas contain established communities that have a history of collaborating with JBLM to support the military's mission and lower the risk for noise complaints. The Buildable Lands data show that these communities have the capacity for new housing and job growth. This demonstrates the need to direct incompatible growth away from areas subject to noise impacts, where feasible, to mitigate noise impacts where new development does occur in the future, and to provide information to residents about potential noise impacts.

Parts of the cities of Yelm and DuPont are included in the Large Weapon CDNL Noise Zones for JBLM firing ranges. Their zoning designations are either conditionally compatible or compatible.

4.3.3. Large Weapon PK15 Noise Zones for JBLM Firing Ranges

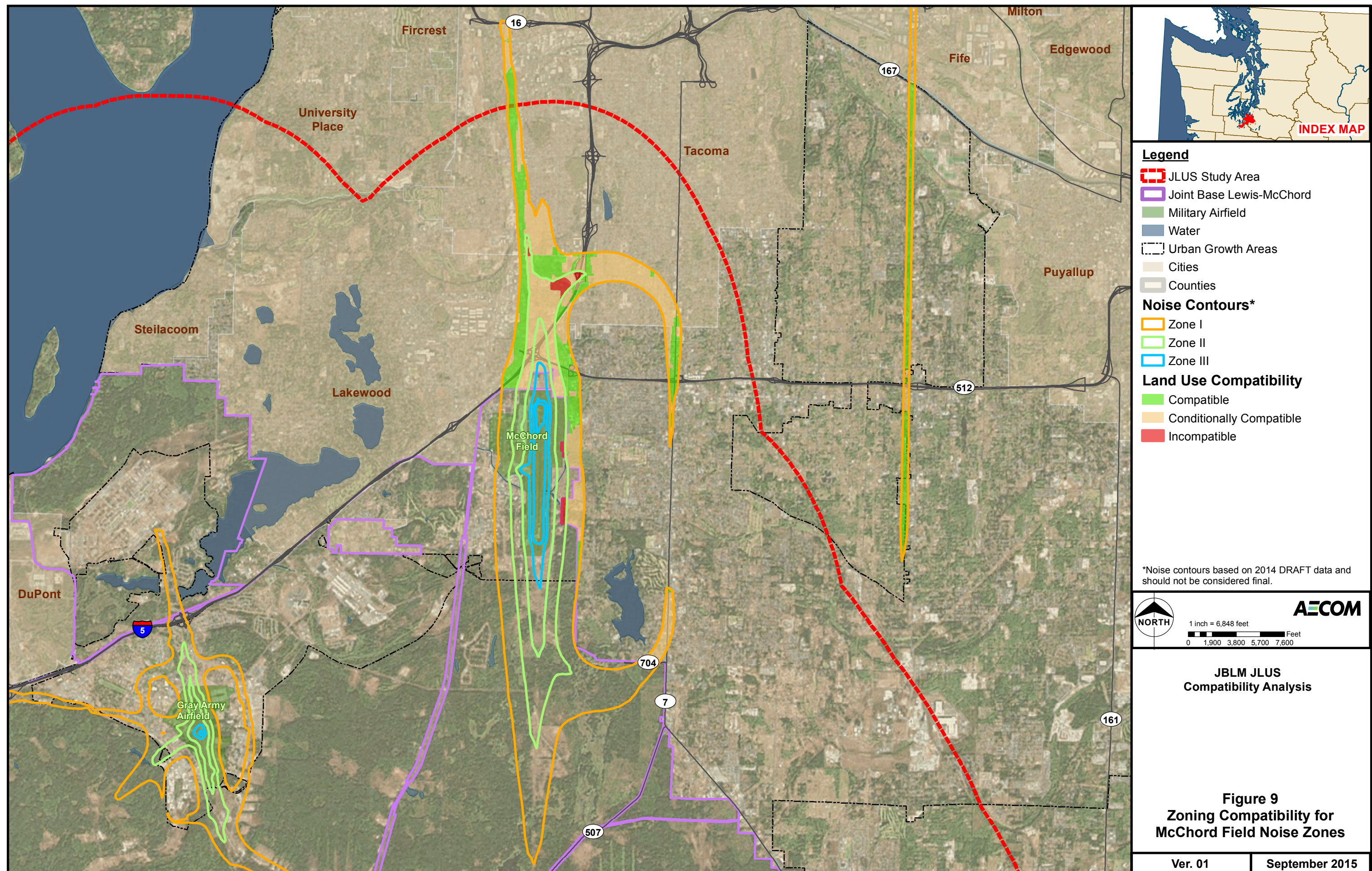
Figures 13 and 14 shows the Large Weapon PK15 Noise Zones for JBLM firing ranges⁵ and zoning or existing land use compatibility. The Large Weapon PK15 Noise Zones reach farther outside of the base than the Large Weapon CDNL Noise Zones. With few exceptions, all areas within the Large Weapon PK15 Noise Zones are considered incompatible due to the risk that civilian complaints about loud single-event noise will lead to the reduction of JBLM military capabilities over time.

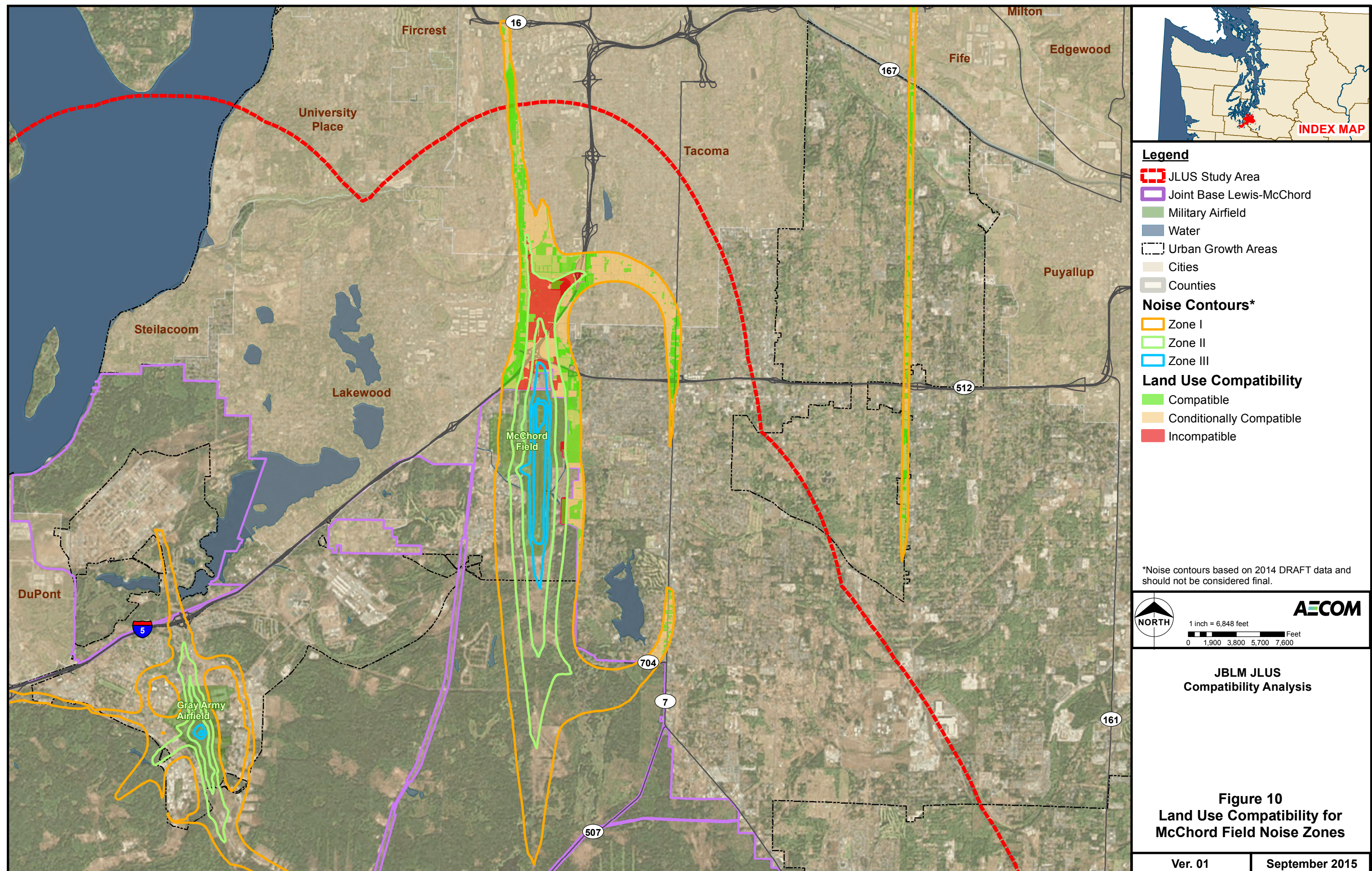
Areas within the Large Weapon PK15 Noise Zones include Roy, parts of Yelm and DuPont, the Nisqually Indian Reservation, unincorporated Pierce County, and parts of the urban growth area in unincorporated Thurston County near Lacey. The Buildable Lands data shows that these areas have capacity for housing and employment growth.

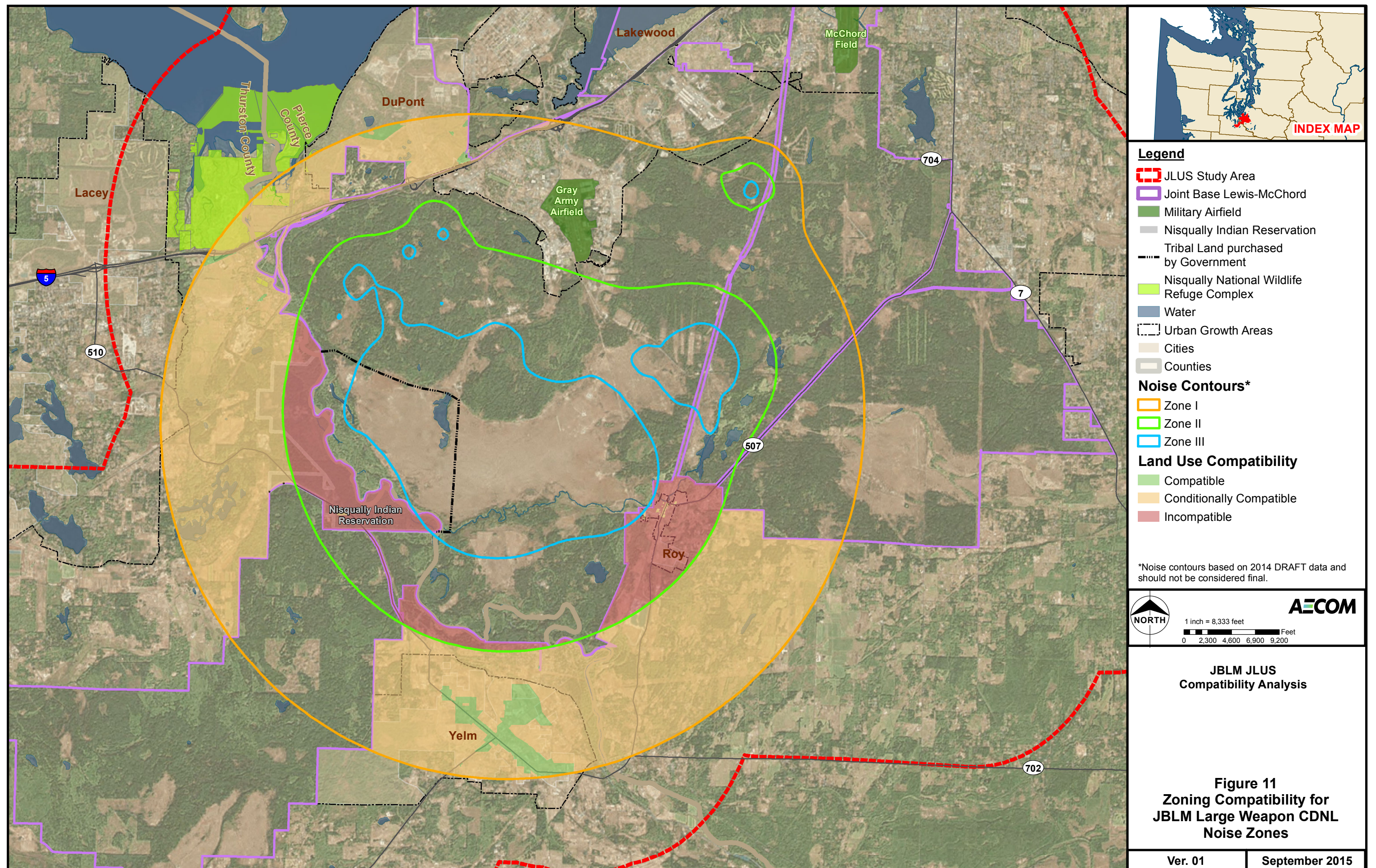
As stated in the prior section, Roy and the Nisqually Indian Tribe have a history of co-existing with JBLM and working to reduce the risk of nuisance complaints. The same is true of Yelm, DuPont, and Thurston County. There is a need for ongoing collaboration between the jurisdictions and JBLM to prevent noise complaints as growth occurs in the region in the coming years.

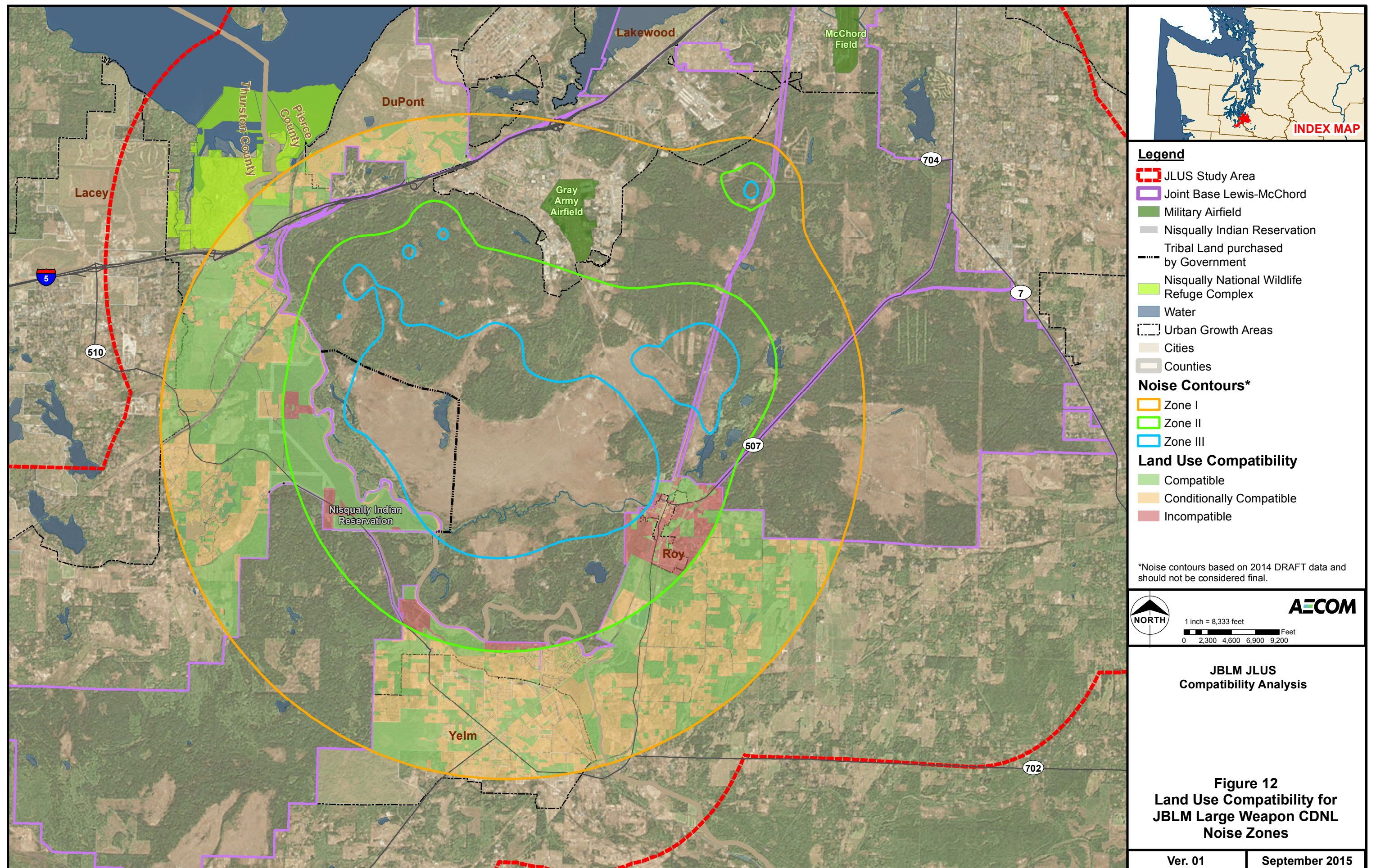
⁴ Based on draft data contained in the 2014 Draft JBLM IONMP.

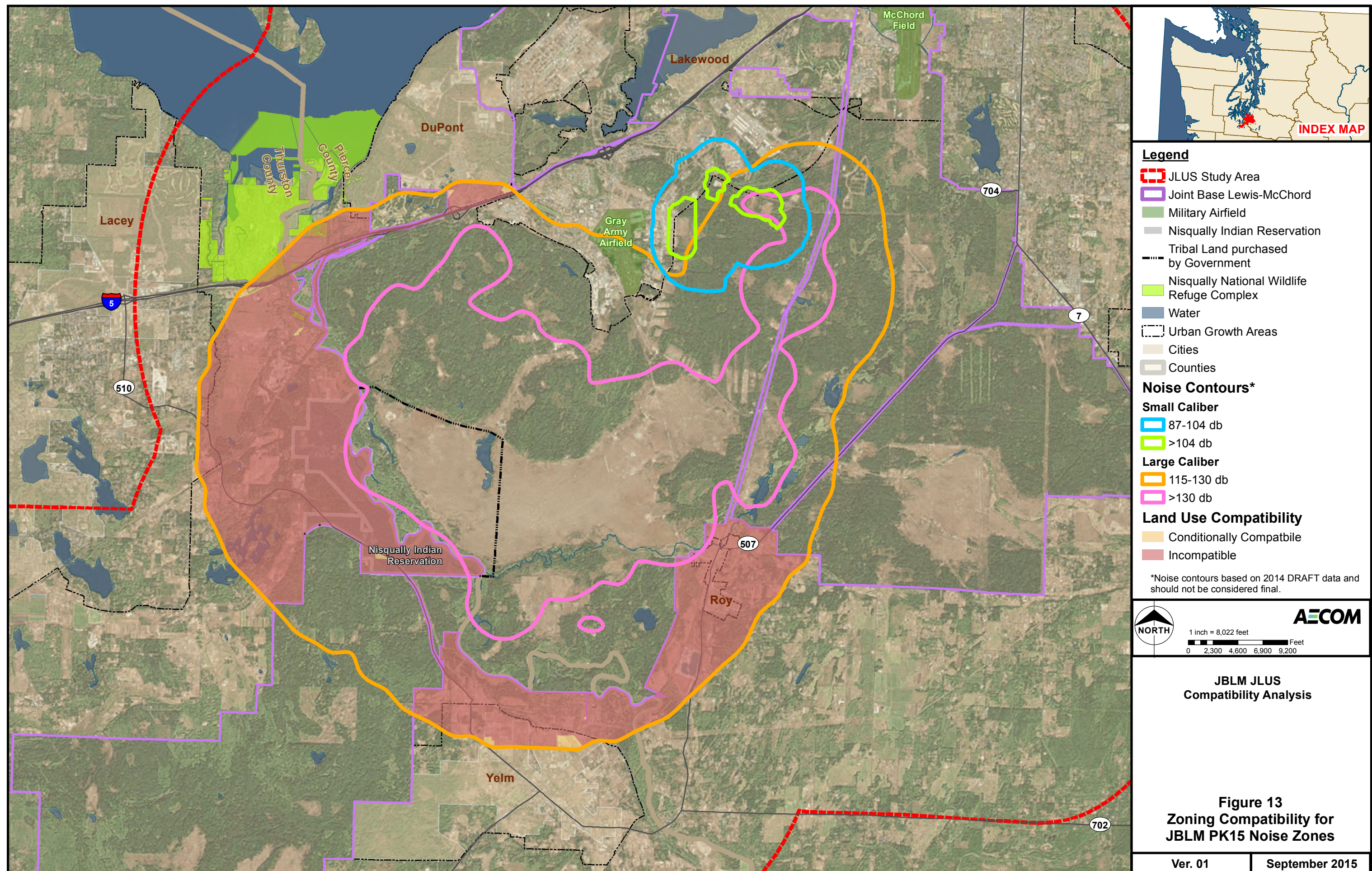
⁵ Based on draft data contained in the 2014 Draft JBLM IONMP.

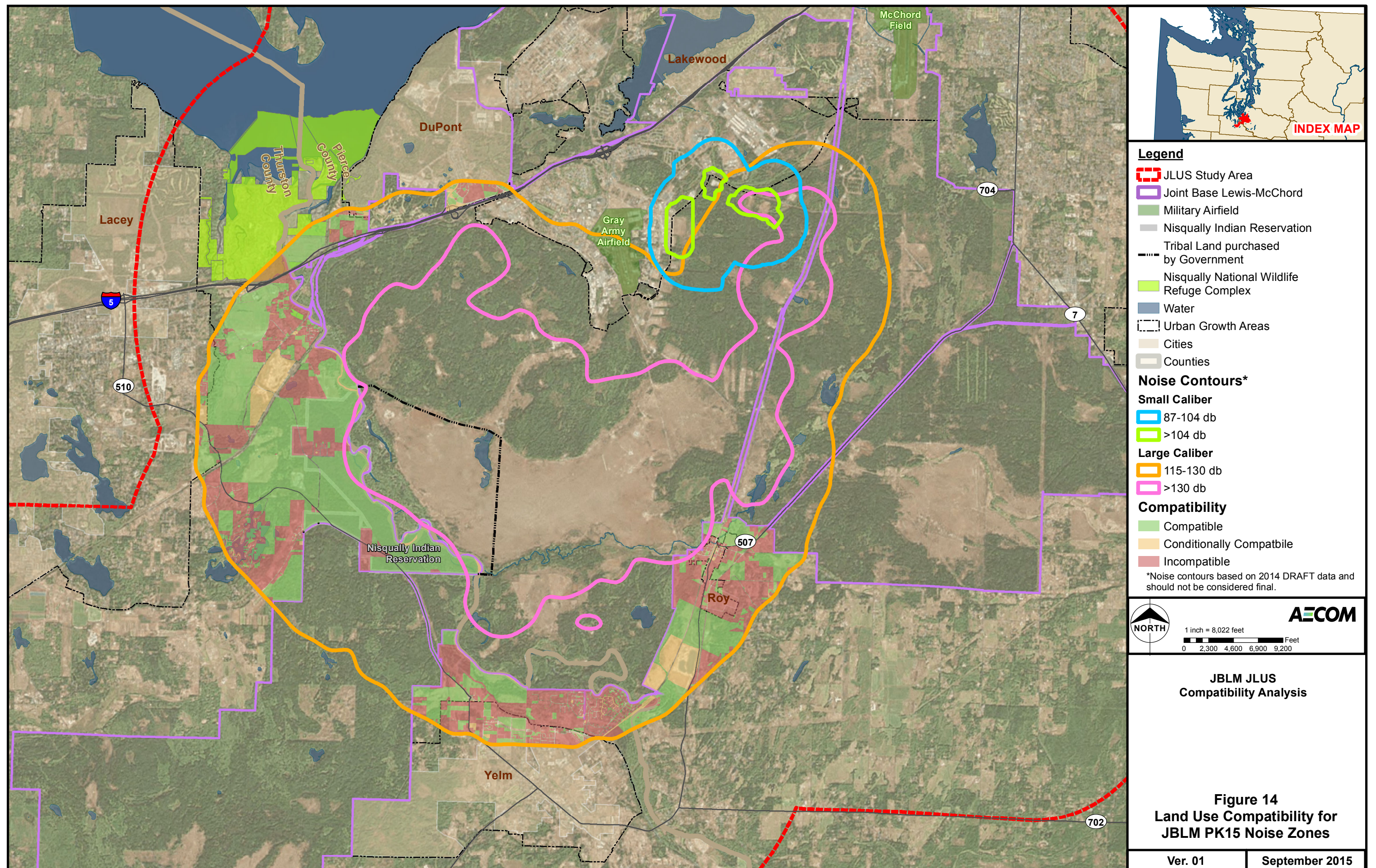












4.4. Transportation

The JBLM Growth Coordination Plan identified the need for regional collaboration to address transportation issues. Since the Growth Coordination Plan was completed, the Washington State Department of Transportation (WSDOT), JBLM, and other partners have undertaken a coordinated effort toward addressing regional transportation issues in the vicinity of JBLM. The summary below, from the *WSDOT I-5 JBLM Vicinity Interchange Justification Report (IJR) and Environmental Documentation, Phase 1 – Corridor Feasibility Study*, January 2014 provides an overview of the issues and primary activities undertaken to implement the Growth Coordination Plan strategy. A subsequent report, the *I-5 JBLM Vicinity Congestion Relief Study, Phase 2 – Multi-modal Alternatives Analysis*, March 2015, reiterates the issues in the Phase 1 document.

I-5 links the key population centers of Vancouver, Olympia, Tacoma, Seattle, Everett, and Bellingham. In the JLUS study area, I-5 also serves a function in national defense by providing access to JBLM. Within south Pierce County, I-5 traffic increased 73 percent between 1986 and 2011 to over 118,000 vehicles per day. The traffic increase in this corridor has been influenced both by population and employment growth, and by increased economic activity including a rapid rise in freight movement. Overall, I-5 has not been widened in the study area since 1975, and is inadequate to meet today's demand. Between 1970 and 2010, the population of Washington State grew by 97 percent, Pierce County grew by 95 percent, and Thurston County grew by 228 percent. Population growth in Pierce and Thurston counties is projected to continue at a similar pace through 2040. The communities of Lakewood, DuPont, and Steilacoom have also grown. Increased residential development has occurred without a commensurate increase in jobs in Thurston County. These changes have resulted in increased through traffic along the I-5 corridor between Olympia and Seattle (and beyond). Increased regional low-density development contributes to the need for widening I-5, which in turn could encroach on JBLM by requiring additional right-of-way and possibly producing impacts to significant cultural resources, such as the Museum and the Family Resource Center, both WWI-era facilities.

While the substantial population growth has affected the corridor, there has also been significant employment growth at JBLM. JBLM has evolved into a strategic military base with more than 75,000 employees, making it the second-largest employer in Washington State. It should be noted, however, that JBLM is the largest employer in the state with employees situated on a single site. Employment on the base has increased substantially since 2006, and JBLM is now the fifth-fastest growing military installation in the United States. Camp Murray, which houses the headquarters of the Washington Military Department and the Washington Air National Guard, has also expanded. Additionally, truck traffic along I-5 in the corridor study area has grown from approximately 8,900 vehicles on a typical weekday in 1986, to over 14,000 in 2011.

There are no existing alternate parallel routes for regional travel through the study area corridor. Using roads other than I-5 requires circuitous routes and extended detours. As a

result, congestion along I-5 through the JBLM vicinity has become a daily occurrence, with heavy through volumes and a large number of vehicles getting on and off the freeway in the study area. Heavy off-ramp traffic backs up along some of the ramps and spills back onto the I-5 mainline. This causes drivers to change lanes to avoid other drivers entering or leaving the highway. All of these lane changes cause traffic to slow, create extended delays, and reduce traffic safety along I-5.

Additionally, the narrowing of I-5 southbound at the Thorne Lane interchange constrains traffic movement. Accommodating traffic growth through the study area is challenging, largely due to the physical constraints along the highway including both the military bases and the presence of an existing rail line paralleling the west side of the freeway.

In 2012, WSDOT undertook an effort to prepare IJR for four interchanges on I-5 through the JBLM area. IJR are required to justify new and/or revised ramps accessing limited access freeways such as I-5. The purpose of these revisions would be to open up opportunities for potential solutions to chronic I-5 congestion in the study area corridor. The I-5 Corridor Study Area, defined by WSDOT, includes nine interchanges running from Mounts Road (Exit 116) on the south to State Route 512 (Exit 127) on the north. Stakeholder participants include the Federal Highway Administration (FHWA); WSDOT; JBLM; Camp Murray; the cities of Lakewood, DuPont, and Lacey; Town of Steilacoom; Pierce County; Nisqually Indian Tribe; SSMCP; Puget Sound Regional Council; Thurston Regional Planning Council; Intercity Transit; Pierce Transit; and Sound Transit.

The Corridor Feasibility Study and the Multi-modal Alternatives Analysis are the guiding document to achieve the following outcomes:

- Create a plan to provide transitional flexibility and guide the preservation of needed right-of-way (ROW), identify program needs for an efficient multi-use/ multimodal corridor such as managed lanes, and improve transit and transportation demand management (TDM).
- Identify and evaluate interchange alternatives that support and enhance cross-circulation for JBLM operations and internal base connectivity to improve interchange operations on I-5, while maintaining the flexibility to consider other alternatives.
- Evaluate the need for and strategic sequencing of additional general purpose lanes.
- Incorporate functional design elements to improve efficiency with the potential to reduce serious and fatal collisions, assess local street and on-base roadway options to improve connectivity within local communities as a means of easing demand on I-5, explore transit priority options and enhanced service opportunities along I-5 and to/from JBLM, and identify a short-list of I-5 mainline scenarios and interchange improvement concepts to be advanced to further phases of analysis and implementation.

The ongoing WSDOT I-5 corridor efforts represent significant steps toward addressing regional JBLM-related transportation impacts. Additional transportation strategies may be needed to address impacts related to the local road network.

4.5. Threatened and Endangered Species and Habitat

Only 10% of the estimated 150,000 acres of prairie present in the South Puget Sound region at the time of Euro-American settlement remain today, and only 30% of what remains is dominated or partially dominated by native flora. The causes are habitat loss due to conifer forest invasion and agricultural/urban development, and habitat degradation due to absence of fire, invasion of non-native vegetation, and military training. One consequence of this loss of habitat is that some animal and plant species that require prairie habitat are at risk of extinction. Recently, the US Fish and Wildlife Service (USFWS) listed the Taylor's checkerspot butterfly (*Euphydryas editha taylori*) as endangered and the streaked horned lark (*Eremophila alpestris strigata*) and four subspecies of Mazama pocket gopher (*Thomomys mazama*) as threatened under the federal Endangered Species Act (ESA).

About two-thirds of the remaining South Puget Sound prairie is on JBLM, along with the source population for checkerspot captive breeding, two of the remaining five populations of lark, most of the remaining populations of the Yelm pocket gopher, and all of the remaining populations of the Roy pocket gopher. Anticipating possible listings, starting in 2006, the Army increased its conservation actions on behalf of these species on JBLM lands, and, in addition, began an Army Compatible Use Buffer (ACUB) program to conserve prairie habitat and the listed species on non-Army land in the South Puget Sound region. The Army also negotiated voluntary restrictions on military training with the USFWS. A draft Biological Opinion (BO) has been issued by the USFWS. When this BO is finalized, JBLM will be legally required to have these restrictions, and to actively participate in the recovery of the listed species.

The restrictions in place include (a) no off-road vehicle maneuver/digging/bivouacking on multiple prairies, (b) mounted maneuver restricted to specific corridors on Ranges 74/76 (the only location on JBLM suitable for live-fire Stryker training), (c) modified mowing regimes at both airfields, (d) modified parachute drop locations in Training Area 14, (e) no-training buffers around active lark nests, and (e) a number of other mitigating natural resource management actions, including when and where prescribed fire can occur. The BO also imposes intensive monitoring requirements for the species populations and habitats, and their responses to military training.

JBLM's ACUB program is unique. ACUB is the Army's implementation of the DoD REPI program, which was authorized by Congress in 2003 to combat encroachment on military installations. The REPI legislation authorizes the military services to acquire interest (in fee or easement; only from willing sellers) in lands outside installation boundaries. These lands are owned and managed as open space by partners (other federal agencies, state/local government, non-governmental organizations). Almost all REPI projects to date have focused on preventing

incompatible development around installation boundaries, but JBLM's ACUB program is specifically designed to reduce environmental encroachment due to the ESA listings.

In 2013, the JBLM ACUB program won a special REPI grant and the South Puget Sound region was designated as the first Sentinel Landscape, a joint initiative by DoD, the US Department of Agriculture, and the US Department of the Interior to preserve landscapes, natural and working, in the vicinity of military installations. As a result, the geographic scope, conservation tools, partners, and funding of the JBLM ACUB increased substantially. To date, more than \$35 million has been invested in the program, split about equally between DoD/Army and the partners.

The lead ACUB partner is the Center for Natural Lands Management. Other major partners are the Washington State Departments of Fish & Wildlife and Natural Resources, Wolf Haven International, the Natural Resources Conservation Service, and the USFWS. To date, JBLM's ACUB program has enrolled 2,952 acres of state, county, and private land already in conservation status, and acquired an additional 2,104 acres as new conservation preserves. On these lands, the ACUB program helps fund (a) restoration of remnant prairies to suitable habitat for listed species, and (b) increasing the numbers and sizes of listed species populations, often through reintroduction to areas where they once existed, but went locally extinct. In addition, the NRCS has acquired conservation easements on 912 acres of agricultural lands that will be managed simultaneously for grazing and prairie conservation. The ACUB program also has invested in planning, monitoring, and research to support the two main conservation actions.

Creative actions under Sentinel Landscapes include research on how to conserve prairie while continuing grazing, outreach and education, teaming with the USFWS and Thurston County to provide regulatory certainty to prairie landowners, internship programs, and two actions just getting underway, a prairie conservation bank and stewardship endowments to fund perpetual management of ACUB lands.

The Army's proactive conservation actions, both on and off of JBLM, raised the "baseline" status of the listed species, allowing the military mission to continue post-listing, albeit with significant restrictions and at substantial additional expense. As the species recover, the restrictions should gradually be lifted. A recently-signed Memorandum of Understanding between JBLM and the USFWS sets the stage for negotiations to develop a system whereby ACUB actions can serve as "credits" to reduce training restrictions.

4.6. Trespass and Unauthorized Access to JBLM Range and Training Lands

The unauthorized use of JBLM range and training lands is a significant concern for a variety of reasons. Civilians not associated with JBLM in the training areas without Range Operations knowledge can interfere with military training and are at risk of injury from training. Trash dumping, primarily household and construction waste is a common problem. Twice per year for a week each time, JBLM sends thousands of soldiers out to clean up trash. Hazardous waste dumping, including household chemicals, batteries, oil, and meth labs poses a risk to soldiers and civilian personnel. JBLM Hazmat must respond to such occurrences. Timber theft, particularly in the Rainier Training Area results in thousands of dollars of lost revenue from commercial wood and interferes with ecosystem management of JBLM forests. Illegal shooting presents a clear risk to soldiers and JBLM civilians. Off-road vehicles, primarily in the Rainier Training Area can interfere with military training and cause environmental damage, especially soil erosion and loss of vegetation. Illegal brush-picking affects ecosystem management of JBLM's forests. Unauthorized use of JBLM lands can also result in other illegal activities, such as methamphetamine production, causing significant safety issues.

In addition to these unauthorized uses of JBLM training lands, there are a number of authorized civilian uses. JBLM is required by the Sikes Act to open range lands for recreational use, although military training and environmental protection are higher priorities. Civilian recreational use of JBLM is allowed in authorized areas only. Twenty-one of the training areas are at times open for civilian recreational use that does not conflict with military operations. Activities include hiking, horseback riding, dog training, wildlife and vegetation observation, orienteering, photography, model boating, and service group camping activities (e.g., Boy Scouts, etc.).

Comments received during public open houses conducted in the initial phase of the JLUS process revealed that public uses of JBLM range lands are a potentially important consideration. JBLM actively manages its extensive, unfenced range and training lands to allow certain public uses based on a system of permits and general authorizations. Such uses include hunting, horseback riding, hiking, and other recreational uses. Unauthorized uses also pose a problem, in particular illegal dumping and illicit drug manufacturing. The maintenance of authorized public uses will not only continue to provide benefits to the neighboring communities, but can also minimize unauthorized uses. For instance, authorized users can spot illegal uses, help to clean up trash, and act as stewards for range lands, when they are not in use for training activities.

The JBLM Range Complex rests on 64,000 acres of land, broken down into 32 separate training areas, 14 indirect firing points, and 65 direct fire ranges.

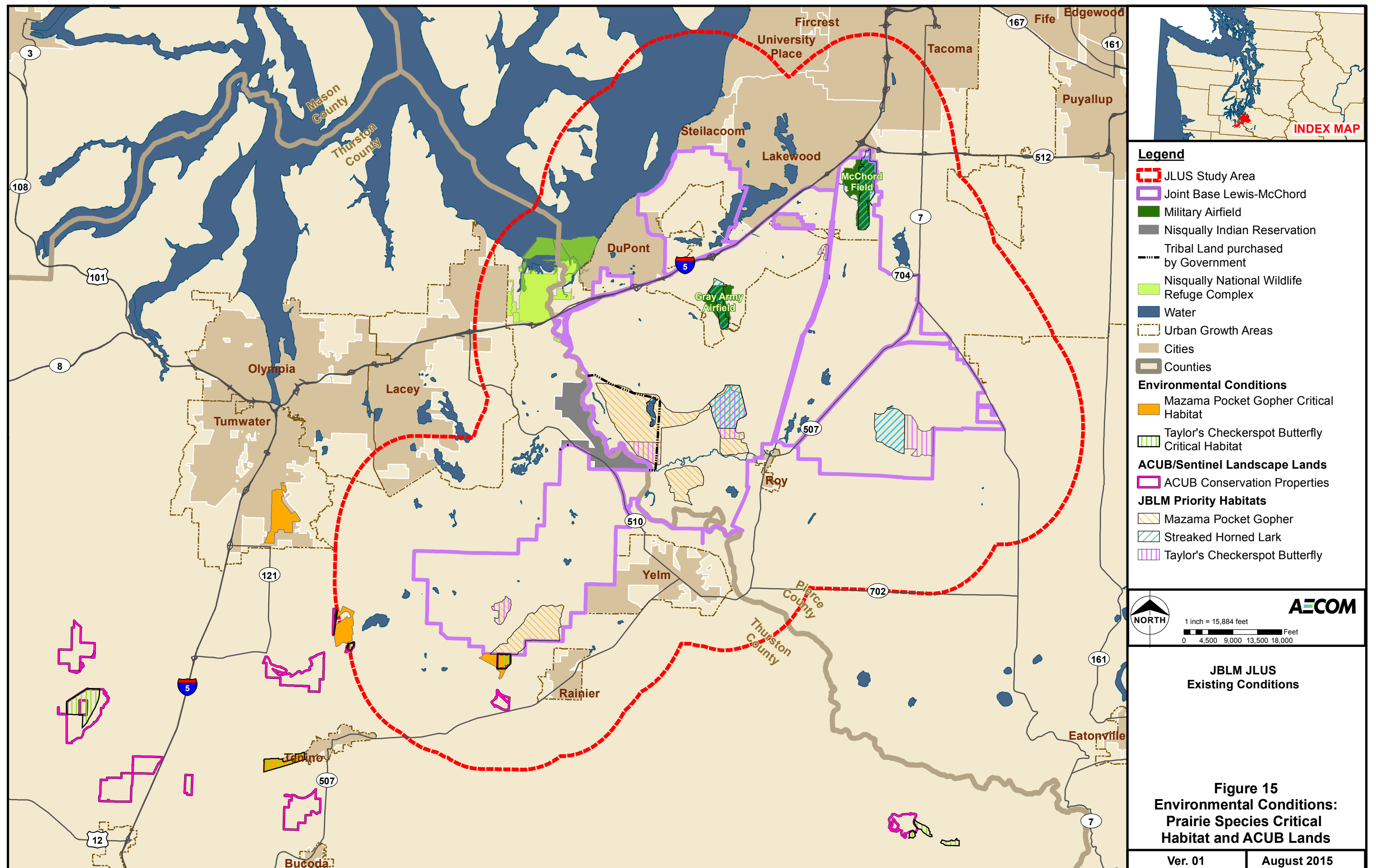
Hunting, fishing, trapping, and the JBLM Morale, Welfare, and Recreation (MWR) ranges (skeet ranges and privately owned weapons Range 15) are authorized in accordance with FL REG 215-1 with coordination from Northwest Adventure Center.

JBLM Range Control operates the Area Access Office to issue permits and grant non-training access to the Range Complex. The Artillery and South Impact Areas are never open to the public due to unexploded ordnance (UXO) hazard. JBLM Range Control publishes a weekly schedule that identifies locations where authorized recreational activities are permitted.

Conduct of illegal activities and nuisance use (such as garbage dumping) on JBLM lands were identified during the public input process. The continuing management of public recreational access to training lands will limit trespass and competition for access to military training lands while maintaining legitimate compatible recreational uses.

4.7. Communication and Coordination

Communication and coordination among JLUS partners is critical for the implementation of compatibility recommendations. The establishment of the South Sound Military & Communities Partnership (SSMCP) has provided a regional forum for such communication and coordination focused on military related issues. The implementation of communication and coordination strategies is an overarching need that will affect the ability to successfully address the other land use compatibility issues addressed in this report.



5. Conclusions

5.1. General Conclusions

Most current land uses around JBLM do not have negative impacts on military capabilities. This is due in part to the work local jurisdictions around JBLM have done since the 1992 JLUS to support base capabilities for training and operations. There are some ongoing and new areas of concern that were identified through the current (2015) JLUS process. These are described below. Continued collaboration is needed between local jurisdictions and JBLM to develop and implement regional solutions to these issues and to support the military's ability to carry out its mission requirements today and in the future.

The following section contains conclusions relating to the seven compatibility issues analyzed in this report. Table 5 summarizes those conclusions.

Table 5. Summary of Conclusions.

Compatibility Issue	Conclusions
Urban Growth	<ul style="list-style-type: none"> • Additional urban growth within the McChord Field North CZ should be prohibited. • Urban growth should be directed away from high noise areas and APZs, where feasible. • Significant growth capacity in the Thurston Highlands Master Planned Community represents potential incompatibility.
Aircraft Safety	<ul style="list-style-type: none"> • Existing non-conforming incompatible uses in the McChord Field north CZ represent the most critical encroachment issue facing JBLM. • JBLM should seek federal, state, and local funding to resume property acquisition efforts in the McChord north CZ. • In APZ II, medium and high density residential uses in Tacoma and recreational uses in Lakewood are categorized as incompatible. • Jurisdictions should seek to phase out incompatible uses in APZs through zoning, property acquisition, and public facility siting decisions.
Noise	<ul style="list-style-type: none"> • Areas in Lakewood and Tacoma near I-5 are zoned for residential, mixed use, and recreational uses categorized as incompatible or conditionally compatible. • Incompatible or conditionally compatible land uses in the JBLM large weapon noise zones include Roy, parts of Yelm and DuPont, the Nisqually Indian Reservation, and parts of the urban growth area in unincorporated Thurston County near Lacey.
Endangered and Threatened Species and Habitat	<ul style="list-style-type: none"> • Listed species requirements limit the scope of training on JBLM training lands.
Transportation	<ul style="list-style-type: none"> • Continuation of current and exploration of new solutions for JBLM-related and other traffic are needed, particularly as it affects local road networks.
Trespass and Unauthorized Access to JBLM Range and Training Lands	<ul style="list-style-type: none"> • The continuing management of access to training lands will limit trespass and competition for access to military training lands while maintaining legitimate compatible recreational uses.
Communication and Coordination	<ul style="list-style-type: none"> • Communication and coordination among JLUS partners are critical for the implementation of compatibility recommendations.

5.2. Urban Growth

Areas around the north of the base are developed with urban uses and are affected by several military impacts, including aircraft safety and military operational noise. Land use patterns in this area are not anticipated to change significantly in the future, although additional densification and development are possible. Areas around the southern portion of the base are generally rural in character, but there are isolated areas with urban character with the potential for future growth, and that may be affected by military-related impacts.

Urban growth in these areas can pose a threat to military capabilities when it occurs in areas subject to potential impacts such as aircraft accidents and noise exposure. Urban growth can threaten military training capabilities when adjacent to training lands by introducing light pollution or increasing the possibility of trespass on training lands. Additional urban growth within the McChord Field North CZ should be prohibited, and incompatible urban growth should be directed away from high noise areas and APZs, where feasible.

5.3. Aircraft Safety

The presence of incompatible land uses in the McChord north CZ is the most critical encroachment issue facing JBLM. Existing structures on the western and eastern edges of the CZ pose challenges for aircraft training and operations, including industrial uses and storage condominium units. Most of these uses are nonconforming with current City of Lakewood zoning; however, there is a small area of land along the western edge of the CZ that is zoned industrial. Additionally, there are industrial uses adjacent to the CZ that emit steam plumes, which could pose aviation hazards. JBLM should seek federal, state, and local funding to resume property acquisition efforts in the McChord north CZ.

In APZ I and II, zoning designations for moderate- and high-density residential uses in Tacoma and Lakewood recreational uses in the Lakewood, and Arlington Elementary School in Tacoma create the potential for concentrations of people in an area with a statistically significant risk of aircraft accident. The Star Lite Swap in Lakewood, an existing public assembly site located in a commercially zoned area of the APZ II, poses the same challenge. Jurisdictions should seek to phase out incompatible uses in APZs through zoning, property acquisition, and public facility siting decisions.

5.4. Noise

There are areas in the McChord Field aircraft noise zones to the north of JBLM and in the large weapon noise zones to the south and southwest of the installation that have the potential to generate public nuisance complaints. Within the aircraft noise zones, a few small areas in Lakewood and Tacoma near I-5 are zoned for residential, mixed use, and recreational uses categorized as incompatible or conditionally compatible. Areas within the JBLM large weapon noise zones include Roy, parts of Yelm and DuPont, the Nisqually Indian Reservation, and parts of the urban growth area in unincorporated Thurston County near Lacey. These jurisdictions have been working with JBLM since the 1992 JLUS to reduce the risk of nuisance complaints and to exist amicably alongside the base. This work will continue to be important in the future since these areas have the capacity for population and employment growth.

5.5. Endangered and Threatened Species and Habitats

Listed species requirements limit the scope of training on JBLM training lands. JBLM has led efforts through the Army Compatible Use Buffer (ACUB) program to acquire property and conservation easements, and to implement habitat restoration outside the installation as well as management of land and training operations on the installation to protect listed species. Thurston County and cities within the County can take additional steps by developing additional habitat conservation programs and regulations.

5.6. Transportation

Ongoing WSDOT and JBLM efforts to address regional transportation impacts along the I-5 corridor through JBLM represent significant progress toward ensuring access and mobility both for JBLM and for the surrounding community. Continuation of current and exploration of new solutions for JBLM-related and -non-related traffic is needed.

5.7. Trespass and Unauthorized Access to JBLM Range and Training Lands

Trespass and unauthorized uses of JBLM range and training lands presents risks to civilians and JBLM personnel and interferes with military training. Civilian recreational use of JBLM is allowed in authorized areas only. JBLM is required by the Sikes Act to open range lands for recreational use, although military training and environmental protection are higher priorities. JBLM Range Control operates the Area Access Office to issue permits and grant non-training access to the Range Complex. The Artillery and South Impact Areas are never open to the public due to UXO hazard. JBLM Range Control publishes a weekly schedule that identifies locations where authorized recreational activities are permitted.

Conduct of illegal activities and nuisance use (such as garbage dumping) on JBLM lands were identified during the public input process. The continuing management of public recreational access to training lands will limit trespass and competition for access to military training lands while maintaining legitimate compatible recreational uses.

5.8. Communication and Coordination

Communication and coordination among JLUS partners are critical for the implementation of compatibility recommendations. The establishment of the SSMCP has provided a regional forum for such communication and coordination focused on military related issues.

6. Preliminary Compatibility Strategies

A variety of strategies could be employed to mitigate the existing or potential land use incompatibilities noted in the preceding analysis. The tables that follow contain a preliminary set of possible strategies that mitigate for existing incompatibility and ensure compatible future development. Tables 7 through 14 are organized according to the seven compatibility issues examined in this report and contain information regarding geographic applicability as well as examples and detailed actions. Tables 15 through 26 organize those same strategies according to the jurisdiction affected.

Based on the review and guidance of the TWG and SSMCP JLUS Subcommittee, this preliminary list of strategies will be refined and prioritized, resulting in an actionable Implementation Plan. The Implementation Plan will contain details such as the timing, order of magnitude costs, potential funding sources, lead and partner jurisdictions/ agencies/organizations, and supporting background information such as model ordinances.

The TWG and SSMCP JLUS Subcommittee conducted a preliminary strategy prioritization exercise intended to identify the highest priority strategies. Table 6 below summarizes the results of that exercise.

Table 6. Preliminary Strategy Prioritization.

Rank	Compatibility Issue	Implementation Strategy	Votes
1	Urban Growth	Incorporate compatibility in updates of local Comprehensive Plans.	15
2	Aircraft Safety	Establish or strengthen permitting process for structures that could pose risks to aviation operations.	9
3	Aircraft Safety/Noise	Real estate tools (e.g., disclosure, deed restrictions, hold harmless agreements).	8
3	Communication & Coordination	Promote pre-planning and review of major new proposals among JLUS internal stakeholders, including JBLM.	8
3	Communication & Coordination	Establish an ongoing JLUS implementation entity.	8
4	Noise	Avoid overflight of sensitive locations and residential areas, when feasible.	6
5	Threatened and Endangered Species and Habitat	Explore use of property tax incentives to encourage preservation of open space and working lands.	5
6	Transportation	Conduct a joint transportation study with a focus on the local circulation network and impacts of ACPs.	4
6	Urban Growth	Incorporate specific land use compatibility requirements into local zoning codes and ordinances (e.g., density or height limits in sensitive areas).	4
7	Aircraft Safety/Noise	Incorporate considerations of aircraft safety and military operational noise into local jurisdiction planning and permitting processes.	3

7	Threatened and Endangered Species and Habitat	Pursue additional conservation partnering opportunities through REPI/ACUB and the Sentinel Landscapes partnership.	3
7	Urban Growth	Enact or amend state-level legislation to promote land use compatibility around military installations.	3
8	Communication & Coordination	Promote analysis of military economic impact in state-wide planning processes.	2
8	Communication & Coordination	Pursue state funding for resolution of encroachment issues.	2
8	Communication & Coordination	Increase outreach by military partners.	2
8	Communication & Coordination	Provide information about military installations and activities to property owners and external stakeholders (e.g., POC guidebook, web-based tools, CPLO).	2
8	Threatened and Endangered Species and Habitat	Expand federal or state role in conservation efforts (e.g., funding, legislation to support land transfers).	2
8	Threatened and Endangered Species and Habitat	Support establishment of conservation banking in Thurston County.	2
9	Aircraft Safety	Promote site planning and design guidelines to reduce Bird Aircraft Strike Hazard (BASH).	1
9	Noise	Promote sound attenuation building standards and/or energy efficiency practices, including retrofits.	1
9	Communication & Coordination	State designated Area of Critical State Concern or Regional Military Influence (RMI).	1
9	Light Pollution	Adopt and enforce local dark-sky ordinances.	1
9	Light Pollution	Conduct a lighting study to refine the geographic area in which a Military Lighting Overlay District may be applied.	1

Table 7. Aircraft Safety Strategies.

Strategy	Actions/Examples	Geographic Applicability	Jurisdictions Affected
Establish or strengthen the permitting process for structures that could pose risks to aviation operations	<ul style="list-style-type: none"> · Permitting and/or notification process to coordinate or guide placement and design of structures such as renewable energy and telecommunications infrastructure · Encourage collocation of cellular towers · Incorporate height/marking standards for structures in MTRs · Work to ensure that infrastructure below 200 feet in height is adequately marked for air traffic safety 	McChord North CZ McChord APZ I McChord APZ II McChord Imaginary Surfaces	Lakewood Pierce County Tacoma
Promote site planning and design guidelines to reduce Bird Aircraft Strike Hazard (BASH)	<ul style="list-style-type: none"> · Develop standards to minimize the attraction of birds near the airfield environs or in low-level flight corridors · Typically includes standards for uses that can attract birds, such as detention ponds, sanitary landfills, crops etc. · Coordinate with state and federal entities on aviation impacts on bird species at wildlife refuges and other natural areas in the region 	McChord North CZ McChord APZ I McChord APZ II McChord Imaginary Surfaces	Lakewood Pierce County Tacoma
Incorporate considerations of aircraft safety and military operational noise into local jurisdiction planning and permitting processes	<ul style="list-style-type: none"> · Provide GIS noise and safety zone layers to permitting staffs so they are clear on property maps 	McChord North CZ McChord APZ I & II McChord Imaginary Surfaces Aircraft Noise Zones Large Weapon CDNL Zones Large Weapon PK15 Zones	DuPont JBLM Lakewood Nisqually Indian Reservation Pierce County Roy Tacoma Thurston County Yelm

Strategy	Actions/Examples	Geographic Applicability	Jurisdictions Affected
Record a formal note indicating proximity of parcel or tract of land to a military installation	<p>Require the recording of a note regarding the location of a parcel/tract within any designated airspace, noise, or safety zone</p> <p>Note appears on title to real property as part of any discretionary development permit, approval, or property transfer</p>	<p>McChord North CZ</p> <p>McChord APZ I & II</p> <p>McChord Imaginary Surfaces</p> <p>Aircraft Noise Zones</p> <p>Large Weapon CDNL Zones</p> <p>Large Weapon PK15 Zones</p>	<p>DuPont</p> <p>Lakewood</p> <p>Nisqually Indian Reservation</p> <p>Pierce County</p> <p>Roy</p> <p>Tacoma</p> <p>Thurston County</p> <p>Yelm</p>
Adopt or promote real estate disclosure in sensitive areas	<ul style="list-style-type: none"> Release of information on possible impacts (noise/vibration, air safety zones) on prospective buyers or renters as part of real estate transactions for properties close to test/training impacts Can be mandatory or voluntary disclosure Can be implemented through a local or state-wide mechanism CalPortland mine redevelopment, Thurston Highlands master planned community 	<p>McChord North CZ</p> <p>McChord APZ I & II</p> <p>McChord Imaginary Surfaces</p> <p>Aircraft Noise Zones</p> <p>Large Weapon CDNL Zones</p> <p>Large Weapon PK15 Zones</p>	<p>DuPont</p> <p>Lakewood</p> <p>Nisqually Indian Reservation</p> <p>Pierce County</p> <p>Roy</p> <p>Tacoma</p> <p>Thurston County</p> <p>Yelm</p>

Strategy	Actions/Examples	Geographic Applicability	Jurisdictions Affected
Explore use of hold harmless agreements	<ul style="list-style-type: none"> Legal document between property owner and installation that is recorded with the property title 	McChord North CZ McChord APZ I & II McChord Imaginary Surfaces Aircraft Noise Zones Large Weapon CDNL Zones Large Weapon PK15 Zones	DuPont JBLM Lakewood Nisqually Indian Reservation Pierce County Roy Tacoma Thurston County Yelm
Explore use of covenants, easements, and other deed restrictions to promote compatibility	<ul style="list-style-type: none"> Easements are conditions voluntarily accepted by property owners or purchased by agencies to secure the rights to allow or limit specific property uses or development Navigation easements, for example, are tailored to impacts associated with aircraft overflight and any attendant noise, dust, vibration, etc. These actions are referred to as “less than fee simple” purchase Could also be explored as a condition of subdivision approval 	McChord North CZ McChord APZ I & II McChord Imaginary Surfaces Aircraft Noise Zones Large Weapon CDNL Zones Large Weapon PK15 Zones	DuPont JBLM Lakewood Nisqually Indian Reservation Pierce County Roy Tacoma Thurston County Yelm

Table 8. Military Operational Noise Strategies.

Strategy	Actions/Examples	Geographic Applicability	Jurisdictions Affected
Promote sound attenuation building standards and/or energy efficiency practices in new buildings	<ul style="list-style-type: none"> · Encourage the adoption of more energy efficient development as a means to achieve complementary indoor sound reduction in new construction · Many of the requirements to increase energy efficiency outlined in the 2012 International Energy Conservation Code, for example, align with recognized sound attenuation requirements · Identify any additional building design and construction practices to reduce the level of noise that penetrates habitable indoor space · Increase awareness among homeowners and builders of sound attenuation and related energy efficiency methods through educational materials · SSMCP can take the lead in promoting these practices. 	Aircraft Noise Zones Large Weapon CDNL Zones Large Weapon PK15 Zones	DuPont Lakewood Nisqually Indian Reservation Pierce County Roy Tacoma Thurston County Yelm
Assist homeowners with the retrofit of windows and other sound attenuation measures to reduce indoor sound levels	<ul style="list-style-type: none"> · Explore funding opportunities to retrofit existing structures with sound attenuation elements 	Aircraft Noise Zones Large Weapon CDNL Zones Large Weapon PK15 Zones	DuPont Lakewood Nisqually Indian Reservation Pierce County Roy Tacoma Thurston County Yelm

Strategy	Actions/Examples	Geographic Applicability	Jurisdictions Affected
<i>Avoid overflight of sensitive locations and residential areas, when feasible</i>	<ul style="list-style-type: none"> · Consider feasibility of re-evaluating and adjusting existing military flight patterns and training routes to reduce noise exposure on local communities and sensitive locations · Decide on process and criteria for selecting noise-sensitive locations and compatible noise levels (Flight routes currently located to avoid sensitive areas) 	Aircraft Noise Zones	JBLM Lakewood Pierce County Tacoma

Table 9. Urban Growth Strategies.

Strategy	Actions/Examples	Geographic Applicability	Jurisdictions Affected
<i>Incorporate compatibility in updates of local Comprehensive Plans</i>	<ul style="list-style-type: none"> · <i>Include references to compatibility with installations, maps, recommendations, and strategies resulting from JLUS</i> · <i>Define and establish Areas of Influence to form the basis of overlay districts</i> · <i>Regulations would specify development characteristics, such as land use type, density, height etc. as appropriate to maintain compatibility with the operational impacts experienced in the designated area</i> · <i>Often used in conjunction with specific and defined planning zones, such as noise contours or airport accident potential zones</i> · <i>Can be broadly defined as a Military Influence Area Overlay that combines other communication and performance-based standards, such as real estate disclosure and joint consultation procedures or sound attenuation of buildings and airport hazard related standards</i> 	<i>JLUS study area</i>	<i>DuPont JBLM Lacey Lakewood Nisqually Indian Reservation Pierce County PSRC Roy Steilacoom Tacoma Thurston County TRPC Yelm</i>

Strategy	Actions/Examples	Geographic Applicability	Jurisdictions Affected
Ensure that the military is aware of and encouraged to participate in major plan updates and amendments	<ul style="list-style-type: none"> Examples include Comprehensive Plans, neighborhood or sector plans in areas of sensitivity, and transportation, infrastructure and natural resource plans 	JLUS study area	DuPont JBLM Lacey Lakewood Nisqually Indian Reservation Pierce County PSRC Roy Steilacoom Tacoma Thurston County TRPC Yelm
Conduct more detailed small area plans within the local communities	<ul style="list-style-type: none"> Establishes more specific land use vision and development framework for areas of sensitivity in advance of emerging development activity Most appropriate for specific, well-defined areas experiencing military operational impacts such as noise or traffic/transportation/gate access issues Engage local residents, including property owners and renters, and businesses. 	JLUS study area	DuPont Lacey Lakewood Nisqually Indian Reservation Pierce County PSRC Roy Steilacoom Tacoma Thurston County TRPC Yelm

Strategy	Actions/Examples	Geographic Applicability	Jurisdictions Affected
<i>Incorporate specific land use compatibility requirements into local zoning codes and ordinances</i>	<ul style="list-style-type: none"> · <i>Include references to compatibility with installations, maps, recommendations, and strategies resulting from JLUS</i> 	<i>JLUS study area</i>	<i>DuPont Lacey Lakewood Nisqually Indian Reservation Pierce County PSRC Roy Steilacoom Tacoma Thurston County TRPC Yelm</i>
<i>Establish and promote the use of Conservation Subdivision Design Ordinance</i>	<ul style="list-style-type: none"> · <i>Establishes by-right access to alternative subdivision layout that condenses lot sizes on most buildable portion of site and requires dedicated open space on remainder of parcel</i> · <i>Uses buffers in the form of preserved open space as part of site development and creates natural mitigation of noise</i> 	<i>JLUS study area</i>	<i>Yelm</i>
<i>Evaluate policy and zoning options to promote infill and mixed use development to guide denser growth into established centers and away from sensitive areas</i>	<ul style="list-style-type: none"> · <i>Used to guide or incentivize growth away from peripheral areas that are likelier to experience military operational impacts due to proximity to installations</i> 	<i>JLUS study area</i>	<i>Lacey Lakewood Nisqually Indian Reservation PCRC Pierce County Tacoma Thurston County Yelm</i>

Strategy	Actions/Examples	Geographic Applicability	Jurisdictions Affected
<i>Explore the use of capital improvement planning and infrastructure system requirements to guide incompatible growth away from sensitive areas</i>	<ul style="list-style-type: none"> Since infrastructure (water, wastewater, roadways) tends to attract growth and enable denser land use patterns, coordinated planning on the extension of public service systems or permitting can promote more compatible development activity in areas exposed to military operational impacts 	<i>JLUS study area</i>	Lakewood Nisqually Indian Reservation Pierce County Tacoma Yelm
<i>Incorporate specific land use compatibility requirements into local zoning codes and ordinances</i>	<ul style="list-style-type: none"> Define and establish Areas of Influence to form the basis of overlay districts Regulations would specify development characteristics, such as land use type, density, height etc. as appropriate to maintain compatibility with the operational impacts experienced in the designated area Often used in conjunction with specific and defined planning zones, such as noise contours or airport accident potential zones Can be broadly defined as a Military Influence Area Overlay that combines other communication and performance-based standards, such as real estate disclosure and joint consultation procedures or sound attenuation of buildings and airport hazard related standards 	<i>JLUS study area</i>	DuPont Lacey Lakewood Nisqually Indian Reservation Pierce County PSRC Roy Steilacoom Tacoma Thurston County TRPC Yelm

Strategy	Actions/Examples	Geographic Applicability	Jurisdictions Affected
Address compatibility issues in joint City/County planning within unincorporated Urban Growth Areas (UGAs)	<ul style="list-style-type: none"> · Enables more robust compatibility planning in unincorporated areas outside of municipal boundaries · Address compatibility issues during regular comprehensive plan and UGA updates (i.e., 10-year comp plan updates, annual docket) · Address compatibility issues in Countywide Planning Policies (CWPPs) 	JLUS study area	DuPont Lacey Lakewood Nisqually Indian Reservation PCRC Pierce County PSRC Roy Steilacoom Tacoma Thurston County TRPC Yelm
State-level legislation to promote land use compatibility around military installations	<ul style="list-style-type: none"> · Can be used to mandate real estate disclosure and joint consultation procedures for certain development or land use change actions in specific areas around military installations <p>The Growth Management Act requires that cities and counties not allow incompatible land uses around military installations and requires consultation with installation commanders prior to land use actions – RCW 36.70A.530)</p>	JLUS study area	Washington State

Table 10. Transportation Strategies.

Strategy	Actions/Examples	Geographic Applicability	Jurisdictions Affected
Analyze local transportation impacts	<ul style="list-style-type: none"> Conduct a joint transportation study with a focus on the local civilian circulation network and impacts of Access Control Point (ACPs) 	JLUS study area	DuPont JBLM Lakewood Nisqually Indian Reservation Pierce County PSRC Roy Steilacoom Tacoma Thurston County TRPC WSDOT Yelm

Table 11. Threatened and Endangered Species and Habitat Strategies.

Strategy	Actions/Examples	Geographic Applicability	Jurisdictions Affected
<i>Pursue additional conservation partnering opportunities through REPI/Army Compatible Use Buffer (ACUB), and the Sentinel Landscapes partnership</i>	<ul style="list-style-type: none"> · Enables the military to enter into agreements with non-federal entities and land owners to secure conservation easements on property near a military installation or military airspace · Pursue opportunities for additional partnerships, such as the Prairie Conservation Bank 	JLUS study area	JBLM Thurston County
<i>Establish a working lands conservation partnership for the region or partner with existing working land trusts to identify priority areas for conservation efforts</i>	<ul style="list-style-type: none"> · Formal partnership to identify areas of interest for conservation planning · USDA is a partner in the Northwest Rangelands Trust and can manage easements on agricultural lands 	JLUS study area	JBLM Thurston County
<i>Explore federal or state legislation to initiate transfer/sale of land between DoD and other federal or state entities. Alternatively, local jurisdiction may facilitate, enable or organize such actions.</i>	<ul style="list-style-type: none"> · Exchange of lands to permit more intensive use or development on lands unaffected by military operations and, in turn, create an open space buffer or compatible low impact uses on lands subject to military impacts · Use acquisition techniques as corrective or preventative measure for land use compatibility. Usually implemented as fee simple acquisition or acquisition of easement, transfer of development rights, or land swap 	JLUS study area	JBLM Thurston County

Strategy	Actions/Examples	Geographic Applicability	Jurisdictions Affected
Explore the purchase of development rights (PDR) or transfer of development rights (TDR) to promote compatibility	<ul style="list-style-type: none"> · Transaction separates development rights from the land in exchange for compensation · Land remains in a low-intensity use, therefore maintaining compatibility · Acquisition of development rights associated with agricultural lands is one of the most common types purchases · REPI is one funding mechanism to achieve purchase of rights; or establish Military Installation Fund (MIF) (Conservation easements have been acquired for prairie habitat conservation) 	JLUS study area	JBLM Thurston County
Explore the feasibility of fee simple acquisition of land to promote compatibility	<ul style="list-style-type: none"> · Acquisition in fee of property within a designated transitional or buffer area near a military installation · Most expensive option available to government (Some fee simple land acquisition has occurred under ACUB program) 	JLUS study area	JBLM Thurston County
Other land conservation/swap/disposal/purchase strategies	<ul style="list-style-type: none"> · Expand conservation banking through Thurston County. There is a need for additional conservation banks · Expand the state and federal role in habitat conservation efforts · Provide regulatory certainty to stakeholders with regard to endangered species and habitat protection regulations. For example the Thurston County Habitat Conservation Plan can provide predictability to landowners and other stakeholders. · Establish endowments for the ongoing maintenance of conservation lands in perpetuity 	JLUS study area	JBLM Thurston County

Strategy	Actions/Examples	Geographic Applicability	Jurisdictions Affected
<i>Explore the use of property tax incentives to encourage the preservation of open space and working lands</i>	<ul style="list-style-type: none"> Examples at the state level include the Williamson Act in California that enables local governments to enter into contracts with private landowners to restrict land to agricultural or related open space use in return for lower property tax assessments Can also be enacted locally 	JLUS study area	JBLM Thurston County

Table 12. Trespass and Unauthorized Access to JBLM Range and Training Lands.

Strategy	Actions/Examples	Geographic Applicability	Jurisdictions Affected
<i>Enhance system of notification and communication with public stakeholders on recreational use of range lands to prevent unauthorized use and improve communications on authorized uses</i>	<ul style="list-style-type: none"> · <i>Enhance notification system for recreational users accessing range lands</i> · <i>Increase awareness through better signage, mapping, and public education strategies</i> · <i>Provide for periodic outreach to recreational user groups to explain access management process and current status</i> · <i>Encourage informal “eyes and ears” by users to keep training lands free of garbage or illegal uses via communication with Range Control</i> 	<i>JLUS study area</i>	<i>JBLM Nisqually Indian Reservation Roy Thurston County Yelm</i>

Table 13. Communication and Coordination Strategies.

Strategy	Actions/Examples	Geographic Applicability	Jurisdictions Affected
<i>Pursue designation as Area of Critical State/Local Concern and Interest</i>	<ul style="list-style-type: none"> <i>An Area of Critical State Concern is similar to the Regional Military Influence, but more limited and can be designated by either state or local government (PSRC and the Growth Management Policy Board are currently considering whether military facilities should be regionally recognized employment centers in the Vision 2040 and Transportation 2040 frameworks)</i> 	<i>JLUS study area</i>	<i>Washington State DuPont JBLM Lacey Lakewood Nisqually Indian Reservation Pierce County Roy Steilacoom Tacoma Thurston County Yelm</i>
<i>Support state designations of an area of Regional Military Influence (RMI)</i>	<ul style="list-style-type: none"> <i>A RMI designates a geographic area to recognize the interdependence of military installations, missions, operating areas and training venues</i> <i>Emphasizes the need for coordinated planning beyond obvious interrelationships between military installations and immediately adjoining neighbors</i> 	<i>JLUS study area</i>	<i>Washington State PSRC TRPC</i>

Strategy	Actions/Examples	Geographic Applicability	Jurisdictions Affected
<i>Promote analysis of military economic impact in state-wide planning processes</i>	<ul style="list-style-type: none"> Promote the inclusion of cost-benefit analysis of military impacts in state-wide planning processes that establish high-level priorities for revenue, jobs, and local community economic health and are used to evaluate project proposals and initiatives (The Governor recently established the Washington State Military & Defense Industry Sector to coalesce and communicate the sector and address challenges and opportunities for growth with focus on base realignment and closure) 	JLUS study area	Washington State
<i>Advocate for state-wide web-based tool to assist with property searches in sensitive areas</i>	<ul style="list-style-type: none"> Alternative platform to a locally-hosted web-based tool 	JLUS study area	Washington State
<i>Pursue state funding for resolution of encroachment issues</i>	<ul style="list-style-type: none"> State contributions to additional studies of encroachment issues State funding of property or easement acquisition 	JLUS study area	Washington State

Strategy	Actions/Examples	Geographic Applicability	Jurisdictions Affected
<i>Increase outreach by military partners in the community to promote understanding of military mission, operations, and benefits to community and build support for compatibility strategies and increased cooperation</i>	<ul style="list-style-type: none"> · Build on outreach efforts of the SSMCP · Use of websites, brochures, briefings, and other media to increase awareness of military activities, mission, and economic impacts · Conduct additional community outreach on military operations and mission to promote visibility of the military · Publication of training schedules or advanced notice of operations when feasible · Conduct quarterly or semi-annual briefings by military representatives at city or at city council/county commission meetings · Other examples are: briefings to community groups; on-installation visits and “field trips” for the public; periodic press releases or media events about mission and economic impacts; and testing and training demonstrations for the public 	JLUS study area	DuPont JBLM Lacey Lakewood Nisqually Indian Reservation Pierce County PSRC Roy Steilacoom Tacoma Thurston County TRPC Yelm
<i>Promote pre-planning and review of major new proposals among JLUS internal stakeholders</i>	<ul style="list-style-type: none"> · Includes DoD, local, regional, state, and federal projects · Must set criteria for the scale or type of action warranting referral · Includes referral of local development and subdivision applications to military installation for advisory review/comment · Include JLUS stakeholders in review of countywide planning policies 	JLUS study area	DuPont JBLM Lacey Lakewood Nisqually Indian Reservation Pierce County Roy Steilacoom Tacoma Thurston County Yelm

Strategy	Actions/Examples	Geographic Applicability	Jurisdictions Affected
<i>Promote formal participation of military representatives on local planning boards and commissions</i>	<ul style="list-style-type: none"> • Military representatives participate as non-voting member of community planning advisory bodies such as Planning and Zoning Commissions • JBLM could be represented as an ex officio member on local coordinating bodies such as the Pierce County Growth Management Coordinating Committee 	JLUS study area	DuPont JBLM Lacey Lakewood Nisqually Indian Reservation PCRC Pierce County PSRC Roy Steilacoom Tacoma Thurston County TRPC Yelm
<i>Participate in a Memorandum of Understanding for joint consultation and information sharing among decision-makers</i>	<ul style="list-style-type: none"> • Formalizes and expands existing procedures regarding notification and consultation/coordination between military, community, local governments, land owners, and land managers on projects, policies, and activities • Establishes clear points of contact in local, state, federal, and DoD agencies 	JLUS study area	DuPont JBLM Lacey Lakewood Nisqually Indian Reservation Pierce County PSRC Roy Steilacoom Tacoma Thurston County TRPC Yelm

Strategy	Actions/Examples	Geographic Applicability	Jurisdictions Affected
Establish an ongoing JLUS implementation entity	<ul style="list-style-type: none"> Build on current SSMCP structure and ongoing regional outreach partnerships Create an implementation body to advocate for the adoption of recommended compatibility measures and promote continued dialogue Umbrella organization chartered, empowered, and funded to support multi-jurisdictional, regional land use planning and track progress on JLUS actions (JLUS Subcommittee of SSMCP Steering Committee currently directing JLUS study) 	JLUS study area	DuPont JBLM Lacey Lakewood Nisqually Indian Reservation Pierce County PSRC Roy Steilacoom Tacoma Thurston County TRPC Yelm
Share information among internal stakeholders for improved coordination	<ul style="list-style-type: none"> Develop an internal web-based tool to facilitate project/plan review among internal stakeholders Internal data clearinghouse that enables GIS sharing, data upload, and comment of posted projects and initiatives May also include additional information on mission activities, such as training schedules or other updates Designate an entity to maintain and monitor site 	JLUS study area	DuPont JBLM Lacey Lakewood Nisqually Indian Reservation Pierce County PSRC Roy Steilacoom Tacoma Thurston County TRPC Yelm

Strategy	Actions/Examples	Geographic Applicability	Jurisdictions Affected
<i>Provide information about military installations and activities to property owners and external stakeholders</i>	<ul style="list-style-type: none"> • Develop and maintain an updated database of points of contact by entity • Compile comprehensive notification lists and expand methods to reach a wider range of affected parties about noise or other mission-related events, including fliers, social media, and texting • Develop online and printed information to highlight military activities, missions, and economic impacts • Create a web-based feature linked to available GIS to enable parcel- or lot-specific searches that identify if a property falls within a sensitive area, such as a noise zone or APZ 	JLUS study area	DuPont JBLM Lacey Lakewood Nisqually Indian Reservation Pierce County PSRC Roy Steilacoom Tacoma Thurston County TRPC Yelm
<i>Other communication/coordination strategies</i>	<ul style="list-style-type: none"> • Create and maintain a “bi-directional” guidebook that identifies points of contact on JBLM and within local communities. • Reinforce SSMCP’s role as liaison between JBLM and communities. • JBLM to pursue funding to hire Community Plans Liaison Officer. • Use the Growth Mgmt. Coordination Committee (GMCC) as the Pierce County forum for liaison and information. 	JLUS study area	DuPont JBLM Lacey Lakewood Nisqually Indian Reservation Pierce County PSRC Roy Steilacoom Tacoma Thurston County TRPC Yelm

Table 14. Other Possible Strategies.

Strategy	Actions/Examples	Geographic Applicability	Jurisdictions Affected
<i>Adopt and enforce local dark-sky ordinances</i>	<ul style="list-style-type: none"> · Reduce the light pollution interference with training activities by requiring the use of fully shielded, cut-off outdoor lighting applications · Down-lighting at all airports and airfields and outdoor stadiums and sports parks · Can be required for major new developments (e.g., commercial, industrial uses) <i>Retrofitting can be encouraged</i>	<i>JLUS study area</i>	<i>DuPont Lacey Lakewood Nisqually Indian Reservation Pierce County PSRC Roy Steilacoom Tacoma Thurston County TRPC Yelm</i>
<i>Adopt on-installation policies to install dark-sky lighting</i>	<ul style="list-style-type: none"> · Use of fully shielded, cut-off outdoor lighting applications for on-installations areas, including ramp lights <i>Intended to minimize light pollution issues affecting regional observatories</i>	<i>JLUS study area</i>	<i>DuPont Lacey Lakewood Nisqually Indian Reservation Pierce County PSRC Roy Steilacoom Tacoma Thurston County TRPC Yelm</i>

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